Feasibility Study
Operable Unit 2
Former Unisys Facility
Great Neck, New York
Site No. 130045

Prepared for:
Lockheed Martin Corporation

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TABLE OF CONTENTS

Section **Page**

Executive Summary xii

E-1 Introduction xii

E-2 Description of the Property and Previous Remedial Activities xiii

E-3 Purpose xv

E-4 Remedial Goals and Remedial Action Objectives xv

E-5 General Response Actions xvi

E-6 Identification and Screening of Remedial Technologies xvii

E-7 Development and Analysis of Remedial Action Alternatives xviii

E-8 Recommended Remedy xxi

LIST OF EXECUTIVE SUMMARY FIGURES AND TABLE

Figure ES-1 Site Location Map

Figure ES-2 Site Layout Map

Table ES-1 Technical and Administrative Implementability Evaluation of Remedial Action Alternatives

1. Introduction 1

1.1 Site Background 2

1.2 Purpose 2

1.3 Objective and Scope 3

1.4 Document Organization 3

2. Site Description and History 5

2.1 Site Description 5
2.2 Site History 5
3. Site Setting and Summary of Human Health Exposure Assessment and Ecological Evaluation 8
3.1 Surface-Water Hydrology 8
3.2 Regional Geology 9
3.3 Regional Hydrogeology 10
3.4 Local Hydrogeology 11
3.5 Vertical Hydraulic Gradients 13
3.6 Previous Site Investigations and Remedial Activities 15
3.7 Summary of Operable Unit 2 Remedial Investigation Activities 15
3.8 Nature and Extent of Groundwater Contamination 16
3.8.1 Upper Glacial Aquifer 17
3.8.2 Upper Portion of the Magothy Aquifer 18
3.8.3 Middle Portion of the Magothy Aquifer 19
3.8.4 Basal Portion of the Magothy Aquifer 19
3.8.5 Lloyd Aquifer 20
3.8.6 Summary of TVOC Groundwater Impacts 20
3.9 Operable Unit 2 Interim Remedial Measure 22
3.10 Village of Lake Success Golf Course Irrigation Water Treatment System 23
3.10.1 General System Overview 23
3.10.2 System Operation in 2010 25
3.11 Human Health exposure assessment 26
3.12 Ecological Evaluation 29
4. Remediation Goals and Remedial Action Objectives 31

4.1 Identification of Potential Standards, Criteria, and Guidance 31
4.1.1 Definition of Standards, Criteria, and Guidance 31
4.1.2 Types of Standards, Criteria, and Guidance 32
4.2 Development of Remedial Action Objectives 32
4.3 Preliminary RemediaTION Goals 33
5. General Response Actions 34
5.1 Volumes for Treatment 34
5.2 Identification of General Response Actions 34
5.2.1 No Action General Response Action 35
5.2.2 Institutional Controls General Response Actions 35
5.2.3 Containment General Response Actions 35
5.2.4 Removal General Response Actions 35
5.2.5 Discharge/Re-Use General Response Actions 36
5.2.6 *Ex-Situ* Treatment General Response Actions 36
5.2.7 *In-Situ* Treatment General Response Actions 36
5.3 Summary of General Response Action Screening 36
6. Identification and Screening of Remedial Technologies 39
6.1 Initial Screening of Remedial Technologies 40
6.2 Criteria for Screening Remedial Technologies and Process Options 40
6.2.1 Effectiveness Evaluation 40
6.2.2 Implementability Evaluation 41
6.2.3 Relative Cost Evaluation 43
6.3 Remedial Technology Screening 43
6.3.1 No Action 43

6.3.2 Institutional Controls 44
6.3.3 Containment 46
6.3.4 Removal 47
6.3.5 Discharge/Re-Use 48
6.3.6 *Ex-Situ* Treatment 49
6.3.7 *In-Situ* Treatment 52
6.4 Summary of Remedial Technology Screening 61
7. Development and Analysis of Remedial Action Alternatives 63
7.1 Rationale for Development of Alternatives 63
7.2 Description of Remedial Action Alternatives 63
7.2.1 Institutional Controls 68
7.2.2 Hydraulic Containment and Removal by Groundwater Pumping with Treatment 69
7.3 Detailed Evaluation of the Remedial Action Alternatives 69
7.3.1 Evaluation Criteria for Detailed Screening of Technologies 69
7.3.2 Alternative 1—No Action and Institutional Controls 75
7.3.3 Alternative 2a—Conversion of the Operable Unit 2 Groundwater Treatment System to the Final Remedy 77
7.3.4 Alternative 2b—Conversion of the Operable Unit 2 Groundwater Treatment System to the Final Remedy with Additional Pumping from the Basal Magothy Aquifer at Operable Unit 1 80
7.3.5 Alternative 2c—Conversion of the Operable Unit 2 Groundwater Treatment System to the Final Remedy with Additional Pumping from the Basal Magothy Aquifer at Operable Unit 1 and Manhasset-Lakeville Water District Well N5099 84
7.3.6 Alternative 3a—Capture Additional Constituent of Concern Mass 87
7.3.7 Alternative 3b—Capture Additional Constituent of Concern Mass 91
7.3.8 Alternative 4a—Targeted Hydraulic Control 94

7.3.9 Alternative 4b—Targeted Hydraulic Control 98
7.3.10 Alternative 4c—Modified Hydraulic Containment 102
7.3.11 Alternative 4d—Minimize Impact to Public Supply Wells 106
7.3.12 Alternative 4e—Minimize Impact to Public Supply Wells 110
7.3.13 Alternative 4f—Minimize Impact to Public Supply Wells 114
7.3.14 Alternative 4g—Targeted Hydraulic Control 117
7.3.15 Alternative 4h—Modified Hydraulic Containment 122
7.3.16 Alternative 5a—Modified Hydraulic Containment 126
7.3.17 Alternative 5b—Hydraulic Containment 130
7.4 Summary of Remedial Action Alternatives Evaluation 134
8. Recommended Remedy 136
8.1 Evaluation Criteria 136
8.2 Primary Discriminators 136
8.2.1 Implementability 137
8.2.2 Cost Effectiveness 137
8.3 Recommended Remedy 138
9. References 140
10. Glossary 143

LIST OF FIGURES

Figure 1-1 Site Location Map

Figure 2-1 Site Layout Map

Figure 3-1 Regional Geologic Cross-Section through Nassau County

Figure 3-2 Wells Located within a 1.5-Mile, 2-Mile, and 2.5-Mile Radius of the Former Unisys Facility

Figure 3-3a Potentiometric Surface Configuration of the Upper Glacial Aquifer – 2010

Figure 3-3b Potentiometric Surface Configuration of the Upper Magothy Aquifer – 2010

Figure 3-3c Potentiometric Surface Configuration of the Middle Magothy Aquifer – 2010

Figure 3-3d Potentiometric Surface Configuration of the Basal Magothy Aquifer – 2010

Figure 3-4a Total Volatile Organic Compound Concentrations in the Upper Glacial Aquifer – 2009

Figure 3-4b Total Volatile Organic Compound Concentrations in the Upper Magothy Aquifer – 2009

Figure 3-4c Total Volatile Organic Compound Concentrations in the Middle Magothy Aquifer – 2009

Figure 3-4d Total Volatile Organic Compound Concentrations in the Basal Magothy Aquifer – 2009

Figure 3-5 Hydrogeological Cross-Sections A-A', B-B', and C-C' Showing Total Volatile Organic Compound Concentrations – 2009

Figure 7-1 Alternative 1

Figure 7-2 Alternative 2a

Figure 7-3 Alternative 2b

Figure 7-4 Alternative 2c

Figure 7-5 Alternative 3a

Figure 7-6 Alternative 3b

Figure 7-7 Alternative 4a

Figure 7-8 Alternative 4b

Figure 7-9 Alternative 4c

Figure 7-10 Alternative 4d

Figure 7-11 Alternative 4e

Figure 7-12 Alternative 4f

Figure 7-13 Alternative 4g

Figure 7-14 Alternative 4h

Figure 7-15 Alternative 5a

Figure 7-16 Alternative 5b

LIST OF TABLES

Table 3-1 Well Construction Details and Survey Coordinates for Wells Within a 2.5-Mile Radius (downgradient) of the Former Unisys Facility, Great Neck, New York

Table 3-2 Vertical Hydraulic Gradients at and in the Vicinity of the Site

Table 3-3 Results of VOC Analysis of Groundwater Samples Collected in April/May 2006 and June 2009/January 2010 at and in the Vicinity of the Site

Table 4-1 Potential Chemical-, Action-, and Location-Specific Standards, Criteria, and Guidance

Table 4-2 Standards, Criteria, and Guidance Values

Table 5-1 Identification and Initial Screening of General Response Actions and Process Options

Table 6-1 Final Screening of Remedial Technologies

Table 7-1 Detailed Evaluation of Remedial Action Alternatives

Table 7-2 Technical and Administrative Implementability Evaluation of Remedial Action Alternatives

Table 7-3 Time to Achieve Total Volatile Organic Compound Concentration of Less than 5 µg/L

Table 7-4 Remedial Action Alternatives Cost Estimate Summary

Table 7-5 Volume of Affected Groundwater and Residual COC Mass After 30 Years of Remediation

Table 8-1 Recommended Remedy Evaluation Matrix

Table 8-2 Volume of Affected Groundwater and Residual COC Mass for the Implementable RAAs After 30 Years of Remediation

APPENDICES

Appendix A Groundwater Model Documentation Report

Appendix B Status of Access Negotiations

Appendix C Cost Model

Acronyms and Abbreviations

ARCADIS	ARCADIS of New York, Inc.
bls	below land surface
CFR	Code of Federal Regulations
cis-1,2-DCE	cis-1,2-dichloroethene
COC	constituent of concern
CWA	Clean Water Act
DER-10	*Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation*
DER-31	*DER-31 Green Remediation*
DGC	Deepdale Golf Club
ERD	enhanced reductive dechlorination
FMCC	Fresh Meadow Country Club
FS Report	*Draft Feasibility Study, Operable Unit 2*
ft/day	feet per day
GAC	granular activated carbon
gpm	gallons per minute
GRA	General Response Action
H2M	H2M Group
HDPE	high-density polyethylene
HHEA	human health exposure assessment
iPark	iPark Lake Success, LLP
IRM	interim remedial measure
ISCO	*in-situ* chemical oxidation
LIE	Long Island Expressway
LIPA	Long Island Power Authority
Lockheed Martin	Lockheed Martin Corporation
Loral	Loral Corporation
LPGAC	liquid-phase granular activated carbon
MCL	Maximum Contaminant Level
MLWD	Manhasset-Lakeville Water District
MNA	monitored natural attenuation

msl	mean sea level
NCDPW	Nassau County Department of Public Works
NCP	National Contingency Plan
NPV	net present value
NSLIJH	North Shore Long Island Jewish Hospital
NST	North Shore Towers
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
O&M	operation and maintenance
OU	operable unit
OU-1	Operable Unit 1
OU-2	Operable Unit 2
OU-2 RI Report	*Draft Remedial Investigation and Baseline Human Health Risk Assessment, Former Unisys Site, Operable Unit 2*
P&T	pumping with treatment
PCE	tetrachloroethene
POTW	publicly owned treatment works
PRB	permeable reactive barrier
PRG	preliminary remediation goal
RAA	remedial action alternative
RAO	remedial action objective
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
ROD	record of decision
RSL	Regional Screening Level
SCGs	standards, criteria, and guidance
site	former Unisys Corporation Facility located at 1111 Marcus Avenue (formerly 365 Lakeville Road) in Great Neck, Long Island, New York
SPDES	State Pollutant Discharge Elimination System
Sperry	Sperry Gyroscope Company
SVE	soil vapor extraction
TCE	trichloroethene
TCL	Target Compound List
TOGS	Technical and Operational Guidance Series
TVOC	total VOC

UFSD	Union Free School District
Unisys	Unisys Corporation
USEPA	United States Environmental Protection Agency
VLS	Village of Lake Success
VLSGC	Village of Lake Success Golf Course
VLSP	Village of Lake Success Park
VOC	volatile organic compound
VPGAC	vapor-phase granular activated carbon
WAGNN	Water Authority of Great Neck North
WAWNC	Water Authority of West Nassau County
ZVI	zero-valent iron
µg/L	micrograms per liter

Executive Summary

E-1 INTRODUCTION

ARCADIS of New York, Inc. (ARCADIS) prepared this *Feasibility Study, Operable Unit 2* (FS Report) on behalf of Lockheed Martin Corporation (Lockheed Martin) for the former Unisys Corporation Facility located at 1111 Marcus Avenue (formerly 365 Lakeville Road) in Great Neck, Long Island, New York (site; Figures ES-1 and ES-2). A draft FS Report was submitted to the New York State Department of Environmental Conservation (NYSDEC) in July 2008 (ARCADIS 2008). This FS Report replaces the 2008 Draft FS Report and has been updated to reflect new site-specific information contained in the *Remedial Investigation Report Operable Unit No. 2 for the Unisys Site, Great Neck, New York, Site No. 130045* (OU-2 RI Report; ARCADIS 2012).

The site is classified by NYSDEC as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York State (Site No. 130045). A Class 2 site is defined as a hazardous waste site that poses significant threat to public health or the environment and requires remedial action (NYSDEC 2010a). To facilitate remediation activities prior to complete characterization, the impacted areas were previously subdivided by NYSDEC into two operable units, designated as Operable Unit 1 (OU-1) and Operable Unit 2 (OU-2). The OU-1 encompasses soils and groundwater within and beneath the 94-acre site, which is currently owned by Apollo Lake Success Property, LLC and 1111 Marcus Avenue Unit 2 Owner, LLC. In March 1997, NYSDEC issued an OU-1 Record of Decision (ROD) for remediation of site soils and groundwater. Required remedial actions consisted of upgrades to an existing groundwater pumping with treatment (P&T) system and expansion of a soil vapor extraction (SVE) system to treat residual volatile organic compound (VOC) impacts in the vadose zone source area. The OU-1 ROD (NYSDEC 1997) also required fencing and signage around the area containing the stormwater retention basins in the southwest quadrant of the site and implementation of deed restrictions in this area.

The off-site area (OU-2), which includes the site-related, constituent of concern- (COC-) affected area outside the boundaries of the 94-acre site, is the subject of this FS Report. Based on the results of the OU-2 RI (ARCADIS 2012), it was determined that off-site vapor intrusion, soils, and sediment do not need to be addressed because no site-related constituents were above standards that would trigger remedial action. The OU-2 RI and this FS were conducted under NYSDEC Administrative Order on Consent No. W-1-0527-91-02 (NYSDEC 1991). Characterization of off-site groundwater within OU-2 has been ongoing since the mid-1990s under purview of NYSDEC. The Remedial Investigation Report (ARCADIS 2012) documents the completion of the characterization for the off-site site related COC affected groundwater which was submitted to the NYSDEC on May 30, 2012.

Downgradient facilities affected by site-related COCs include two wells (N12999 and N13000) operated by the Water Authority of Great Neck North (WAGNN) and a third WAGNN well (N13000b, whose permanent ID is now N13821) that has not yet begun operating; Village of Lake Success Golf Course (VLSCG) irrigation well N8038; and North Shore Towers existing irrigation wells N13221 and N13266 and recently installed well NST1 (whose permanent ID is now N13889). The Manhasset-Lakeville Water District (MLWD) well N5099, Fresh Meadow Country Club (FMCC) well N2169, and WAGNN wells N4388 and N12796 are predicted to be impacted by site-related COCs within the 30-year period evaluated in this FS.

To minimize the off-site migration of impacted groundwater toward potential downgradient facilities and receptors and enhance contaminant mass reduction at an early stage, Lockheed Martin designed an interim remedial measure (IRM) for off-site groundwater in 2004 that began operation in 2006. The IRM for OU-2 consists of pumping approximately 500 gallons per minute (gpm) of groundwater from well RW100 installed north of the site in the area of impacted water and treating the water by removing VOCs using air strippers before recharging the cleaned water into the underlying aquifer.

E-2 DESCRIPTION OF THE PROPERTY AND PREVIOUS REMEDIAL ACTIVITIES

The site was used to manufacture defense-related products from 1941 to 1995. The on-site facility was originally designed and built by the United States Government and was operated under

contract to Sperry Gyroscope Company (Sperry) from 1941 to 1951. In 1951, the United States Government sold the site to Sperry, which merged with Burroughs in 1986 to form the Unisys Corporation (Unisys). In May 1995, Loral Corporation (Loral) purchased the site from Unisys, and in March 1996, Lockheed Martin acquired the site through its acquisition of Loral. Lockheed Martin then sold the site to iPark in early 2000.

The site (Figure ES-2) occupies approximately 94 acres, on which a main building and several smaller buildings (located south of the main building) exist. The smaller buildings formerly included a foundry building, environmental testing building, boiler building, garage, maintenance shop, and the Lakehouse building. The main building has since been converted to commercial rental space, as have most of the smaller buildings, except for the environmental testing and Lakehouse buildings, which have been demolished. The balance of the site consists of paved areas (parking lots) and three stormwater retention basins.

The OU-1 remediation system is located in the northeast corner of the site (Figure ES-2) and includes a groundwater treatment plant, three remedial groundwater extraction wells (EW1, RW1RS, and RW1RD), and associated piping located on site along Marcus Avenue. Treated water is conveyed to three off-site diffusion (recharge) wells (DW11, DW12, and DW13) northeast of the site, on property owned by the New York State Office of Parks and Historic Preservation and are designed to return treated water to the aquifer.

Between 1978 and November 1996, a series of on-site studies were performed to investigate VOC contamination in soil and groundwater. The first study traced the origin of the VOCs to a series of dry wells (subsurface structures constructed for liquid disposal) near the southeast corner of the main building.

In April 1993, Unisys installed a 1,100-gpm groundwater P&T system as an IRM to remove VOCs in groundwater at the northern site boundary. In January 1994, Unisys also installed a SVE system (also an IRM) in the dry well area to recover residual VOCs in the soil. In 1998, three dry wells were excavated to a depth of 30 feet, and approximately 800 tons of soil contaminated with VOCs and metals were removed and disposed of off site at an approved facility. The excavation was then backfilled with certified clean sand.

These investigations and remedial activities culminated in a ROD for on-site soil and groundwater (NYSDEC 1997). In accordance with the ROD, the SVE system was expanded to address soil and perched water outside in the southeast corner of the main building. A ROD that was in compliance with the groundwater treatment system was constructed and began operation in 2001 to replace the OU-1 groundwater IRM treatment system. The upgraded system is designed to minimize the additional migration of site-related COCs from the site.

E-3 PURPOSE

The overall goals of the OU-2 feasibility study are to evaluate remedial action alternatives (RAAs) that will protect public health and the environment from site-related COCs detected in off-site groundwater and to recommend a remedial alternative based upon the evaluation. This FS Report includes a summary of remedial goals and remedial action objectives (RAOs) developed for OU-2, evaluation and screening of remedial technologies, the results of development and evaluation of applicable RAAs, and a recommendation of a final remedy for implementation. The RAOs and RAAs are based on information obtained from the OU-2 RI Report (ARCADIS 2012), including the nature and extent of contamination, performance characteristics of the OU-2 IRM, baseline human health exposure assessment and ecological evaluation, and computer-based fate and transport modeling, which produced projections through time of the movement of the contaminants in response to existing and proposed pumping. This FS Report was prepared pursuant to *DER-10 Technical Guidance for Site Investigation and Remediation* (NYSDEC 2010b) and *DER-31 Green Remediation* (NYSDEC 2010c).

E-4 REMEDIAL GOALS AND REMEDIAL ACTION OBJECTIVES

The first step to developing the remedial goals and RAOs is to determine the standards, criteria, and guidance (SCGs) that are appropriate for OU-2. Standards and criteria are generally cleanup standards and environmental requirements that are enacted by federal and/or state law, whereas guidance is non-promulgated criteria and advisories. The SCG values are divided into three groups: 1) chemical-specific, 2) action-specific, and 3) location-specific. The chemical-, action-, and location-specific SCG values for OU-2 are identified in Section 4 of this FS Report. The following RAOs for OU-2 are also developed in Section 4 of this FS Report:

- Continue to protect public health by further mitigating exposure to site-related COCs in groundwater at concentrations in excess of SCG values.

- Attain SCG values for site-related COCs in the groundwater to the extent practicable.

Preliminary remediation goals (PRGs) represent chemical-specific concentration goals for specific media at Superfund, Brownfield, federal, and Resource Conservation and Recovery Act sites. For OU-2, PRGs are determined to be the most stringent of federal Maximum Contaminant Levels, New York State Maximum Contaminant Levels/Groundwater Quality Standards, and New York State Guidance (*Technical Operational and Guidance Series 1.1.1; NYSDEC 1998).*

E-5 GENERAL RESPONSE ACTIONS

General response actions (GRAs) and associated process options, presented in Section 5, are identified based on applicability of achieving the OU-2 RAOs. The GRAs describe the actions that can potentially achieve the RAOs developed for the site. Process options are different technologies within a GRA (e.g., *ex-situ* treatment includes air stripping and granular activated carbon [GAC] treatment process options). The following GRAs are identified and screened for use in OU-2: no action (required by DER-10 [NYSDEC 2010b]); institutional controls; containment; removal; discharge/re-use; *ex-situ* treatment; and *in-situ* treatment. Following screening and evaluation, the retained process options for each GRA are as follows:

- **No Action:** No process options.

- **Institutional Controls:** Deed restrictions, groundwater monitoring, and beneficial re-use through wellhead treatment (at site-related, COC-impacted purveyor wells that are above SCG values).

- **Containment (**implementing hydraulic control to reduce additional off-site migration of the site-related, COC-affected groundwater): Groundwater pumping via groundwater extraction wells.

- **Removal** (reduction of COC mass from COC-affected groundwater): Groundwater pumping via groundwater extraction wells.

- **Discharge/Re-Use** (methods or means used to manage extracted and treated groundwater): Beneficial re-use through subsurface injection via diffusion wells and use by purveyors (following treatment).

- ***Ex-Situ* Treatment** (aboveground treatment of groundwater): Air stripping, GAC treatment, and advanced chemical oxidation.

- ***In-Situ* Treatment** (subsurface treatment of groundwater): In-well air stripping, *in-situ* chemical oxidation, enhanced reductive dechlorination, permeable reactive barriers with zero-valent iron, air sparging with SVE, phytoremediation, and monitored natural attenuation.

The above GRAs and process options are retained for a final screening to determine appropriate remedial technologies for OU-2. The technologies determined to be appropriate for OU-2 are then assembled into RAAs and evaluated in detail to select a recommended remedy for implementation.

E-6 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES

The GRAs and their associated process options are screened to determine the group of remedial technologies to be assembled into RAAs (Section 6). The screening process incorporates evaluation of the technologies and process options for the following: 1) effectiveness, 2) implementability, and 3) relative cost. Technologies are determined to be either effective or ineffective based on their ability to meet SCG values and RAOs and potential impacts to public health and the environment during implementation. Implementability of technologies and process options are gauged as follows: 1) implementable, 2) potentially implementable, 3) difficult to implement, or 4) not implementable. Implementability is mainly based on the ability to gain access to a property to install remedial infrastructure, the ability to permit the remedial system, the time period to implement the remedy, and other factors. Finally, relative costs are determined for each technology and process option, and the costs are evaluated as follows: 1) low, 2) moderate, or 3) high. The following technologies and process options—grouped by GRA—are retained for assembly into RAAs and subsequent detailed evaluation:

- **No Action** (baseline scenario).

- **Institutional Controls**. Deed restrictions, groundwater monitoring, and wellhead treatment.

- **Containment**. Hydraulic control via groundwater P&T.

- **Removal**. Reduction of COC mass via groundwater P&T.

- **Discharge/Re-Use**. Subsurface injection or use by purveyors (following treatment).

- ***Ex-Situ* Treatment**. Air stripping (with vapor treatment using adsorption to GAC).

The *in-situ* treatment GRA was eliminated from further consideration during the screening process.

E-7 DEVELOPMENT AND ANALYSIS OF REMEDIAL ACTION ALTERNATIVES

The technologies and process options retained from the screening process are assembled into 16 RAAs. Only the five RAAs that are determined to be implementable are presented in the Executive Summary, but all 16 RAAs are evaluated in detail in Section 7. All of the RAAs, except RAA-1, are prepared with the assumption that the currently operating OU-2 IRM is included. The RAAs that are retained and are implementable include the following:

- **RAA-1 – No Action** (Baseline scenario that does not include the current OU-2 IRM, but does include OU-1 system operation and purveyor well treatment as necessary [institutional controls])

- **RAA-2 – Conversion of the OU-2 IRM System to the Final Remedy as a Primary Action**:

  - **2a** – No additional infrastructure above and beyond continuing to run the existing off-site IRM along with the OU-1 system.

  - **2b** – Install one new on-site (OU-1) remedial well with treatment provided by the existing OU-1 treatment system to accommodate the additional treatment volume. This system is currently operating at approximately 730 gpm and was designed to handle up to 900 gpm.

  - **2c** – Install one new remedial well at OU-1 (same as 2b). To mitigate risks to MLWD well N5099, a new treatment system for this well would be constructed at the well site. MLWD would continue to use the well at a higher flow rate than the current average.

- **RAA-3 – Capture Additional COC Mass**:

- **3b** – Install one new on-site remedial well (same as 2b). In addition, one new remedial well would be installed along with a new groundwater treatment system at the northeast corner of the VLSGC and two new diffusion wells would be installed in the northwest portion of the VLSGC. The new diffusion wells would be connected to the proposed treatment system at VLSGC via piping installed along the northern and western boundaries of its golf course.

All 16 of the RAAs were evaluated by each of the following seven criteria, as required by DER-10 (NYSDEC 2010b):

1. Overall protectiveness of public health and the environment
2. Conformance with SCGs
3. Long-term effectiveness and permanence
4. Reduction of toxicity, mobility, or volume of contamination through treatment
5. Short-term impact and effectiveness
6. Implementability
7. Cost effectiveness

In addition to the above seven criteria, an eighth criterion, consistent with green remediation principles (compliance with *DER-31* [NYSDEC 2010c])—has been added to the FS evaluation. A ninth criterion, community acceptance, is also evaluated by NYSDEC, but only after the public involvement process is complete. For this reason, community acceptance has not been evaluated in this FS Report. However, Lockheed Martin has made significant efforts and established dialog with major stakeholders to evaluate the implementability and conceptual acceptance of the various RAAs. This is further discussed in Section 7 and Appendix of this report. This criterion will be evaluated after any public comments on the remedy have been received and prior to selection of the remedy.

All of the RAAs are protective of public health because institutional controls have already and will continue to include providing wellhead treatment (where necessary) at purveyor wells and at a golf course irrigation well that have or will become affected above groundwater SCG values during implementation of the remedy. Each of the RAAs is also equally protective of the environment because no surface waters will become affected and each RAA removes approximately 30,000 pounds of COC mass in the 30-year evaluation period. All RAAs comply with action-, location-, and chemical-specific SCGs. The RAAs are all effective in the long-term. However, the alternatives are not projected to achieve the water quality RAO throughout OU-2 within 30 years. None of the RAAs reduce the toxicity (the COCs are not made less toxic in groundwater because their chemical compositions are not altered by the remediation processes) or mobility (the physical parameters of the aquifer are not affected by remediation) of site-related, COC-affected groundwater throughout OU-2 within 30 years. All of the RAAs reduce the volume of site-related, COC-affected groundwater throughout OU-2 from approximately 73,700 acre-feet to a maximum residual volume of approximately 36,200 acre-feet for RAA-1 and a minimum residual volume of approximately 4,000 acre-feet for RAA-5b.

The short-term impact and effectiveness evaluation of the RAAs includes consideration of adverse effects on the community while implementing the remedy and the anticipated time required to achieve RAOs throughout OU-2. The short-term adverse effects on the community during implementation of the five implementable RAAs is as follows: four are classified as having minimal impact (RAA-1, RAA-2a, RAA-2b, and RAA-2c), and one (RAA-3b) is classified as having some impact. The remaining 11 RAAs that are not considered to be implementable all have high impacts on the community during implementation.

The time to achieve the RAOs in the five implementable RAAs is indeterminate for RAA-1 and greater than 30 years for the others.

The 30-year net present value (NPV) cost per pound of COC removed for the five implementable RAAs ranges from $300 (RAA-1) to $1,800 (RAA-3b). Capital and operation and maintenance costs for each of the 16 RAAs are provided in Section 7. Although each of the RAAs has provisions that protect public health and the environment and most remove approximately the same quantity of contaminant mass, cost-effectiveness varies greatly among the RAAs.

The five implementable RAAs are the most sustainable or "green" of the 16 RAAs evaluated in this FS Report. Sustainability includes minimizing energy consumption, air emissions, water consumption, and material consumption (protection of natural resources and/or the beneficial reuse of resources) and waste generation. This is mainly because of the complexity associated with infrastructure installation of the other RAAs, which also means they are not cost-effective. All of the RAAs achieve beneficial re-use of the treated groundwater via subsurface injection or use by a purveyor or golf course.

E-8 RECOMMENDED REMEDY

The eight criteria listed in Section E-7 are used to determine the recommended remedy. Six of the evaluation criteria—overall protectiveness of public health and the environment; conformance with SCGs; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume of contamination through treatment; short-term impact and effectiveness; and consistency with green remediation principles—are not discriminators because they have comparable evaluation scores for the RAAs during the 30-year evaluation period. Thus, the remaining two criteria—implementability and cost-effectiveness—are the primary discriminating criteria used to determine the appropriate remedy for OU-2.

The implementability criterion encompasses the technical and administrative feasibility of executing an RAA with associated process options. Technical implementability pertains to the difficulties associated with infrastructure construction and site availability for the RAAs with associated process options. For this FS, each RAA is given a technical implementability ranking from 1 to 4, with 1 being the easiest to construct. Administrative implementability mainly involves obtaining access to properties where extraction/diffusion wells and treatment system components of each RAA must be installed. For this FS, each RAA is assigned an administrative implementability ranking from 1 to 10, with 1 corresponding to the highest likelihood of negotiating and obtaining access to construct the required infrastructure. The overall implementability score for each RAA is an aggregate of the technical and administrative implementability scores, and ranges from 2 to 14. Remedial action alternatives with implementability scores of 6 or less are considered to be implementable based on ongoing access negotiations with critical site owners where infrastructure is required. Table ES-1 summarizes the

implementability score, mass of site-related COCs removed, and NPV costs per pound of COC removed for the five implementable RAAs.

As presented above and summarized in Table ES-1, the two primary discriminators are implementability and cost-effectiveness. The recommended remedy is RAA-2c based on the following discriminators:

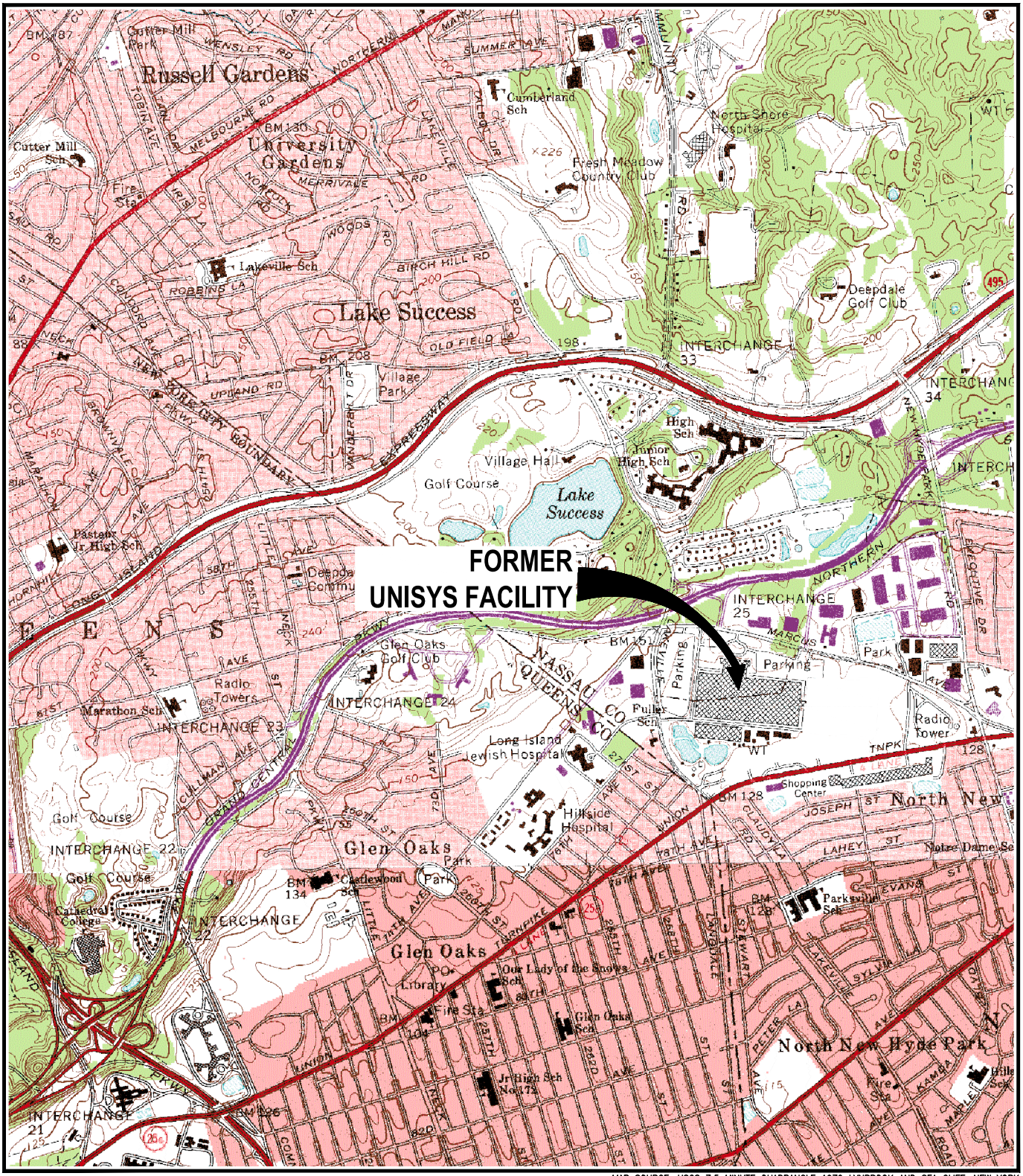
- It has an implementability score of 5, which indicates that it can be implemented.
- A preliminary commitment has been obtained from MLWD for the implementation of RAA-2c, assuming NYSDEC and NYSDOH approval. A draft agreement is in negotiations between MLWD and Lockheed Martin that supports this option and will allow for the construction of a new treatment system without additional stakeholder negotiations. For the two reasons above, RAA-2c is the alternative that can be implemented in the shortest period of time, yet provides comparable hydraulic control and minimization of site-related COC migration to many other RAAs.
- It removes a similar quantity of site-related COC mass as compared to the other RAAs.
- Reduces the volume of site-related, COC-affected groundwater from approximately 73,700 acre-feet to approximately 22,400 acre-feet—a reduction of approximately 70 percent, which is the largest reduction of the implementable RAAs (Table ES-1).
- It is one of the most cost-effective RAAs ($1,300 per pound on an NPV basis) based on an evaluation of NPV cost per pound of site-related COC mass removed.
- It allows MLWD to continue to use N5099—a critical water purveyor well—albeit at an increased flow rate.
- It is the most sustainable of the RAAs that includes a new treatment system because it maintains beneficial use through treatment and eliminates the need to pump water to the surface twice, once for treatment and again to supply wells after the treated water is injected into the subsurface.

- It assists in maintaining both water quality and affordability of water to MLWD's customers within the service area.

- It is expected to have the lowest impact to the community during construction and operations and to involve the least consumption of resources during the implementation, which translates into the most sustainable solution using green principles.

- It is protective of public health and the environment since no one will be exposed to site-related COCs and affected groundwater will not affect lakes, ponds, or the surface water management system.

In addition RAA-2c is the last element of a larger strategy to remediate the site-related, COC-affected groundwater from the former Unisys site. There are several other components that, when combined with RAA-2c, constitute the overall remedy for the site-related, COC-affected groundwater. The other components are source control, groundwater P&T, and the implementation of institutional controls. Source control has involved the removal of site-related, COC-affected soil and the implementation of a SVE system to recover residual site-related COC mass in the source area. Groundwater P&T includes the upgraded OU-1 system designed to minimize the further migration of site-related COCs from the site; the installation of the OU-2 IRM that is designed to recover as much site-related COC mass from a "hot spot" in the off-site COC-affected groundwater; and the "on call" system that will be installed as necessary for the VLSGC irrigation well to prevent site-related, COC-affected groundwater from entering Lake Surprise. Existing deed restrictions prevent contact with COC-affected sediment in the on-site stormwater basins. Because RAA-2c accomplishes the goals set out for the OU-2 remedy at a reasonable cost and, when combined with other remedial components, constitutes an effective remedy for the site-related COC-affected groundwater, Lockheed Martin requests that it be selected as the recommended RAA for OU-2.


FORMER
UNISYS FACILITY
Russell Gardens
University Gardens
Lake Success
Golf Course
Lake Success
Village Hall
Village Park
Cutter Mill Park
Cutter Mill Sch
Lakeville Sch
Cumberland Sch
North Shore Hospital
Fresh Meadow Country Club
Deepdale Golf Club
Pasteur Jr High Sch
Deepdale Commu
Glen Oaks Golf Club
Radio Towers
Marathon Sch
Long Island Jewish Hospital
Hillside Hospital
Fuller Sch
Radio Tower
Shopping Center
Glen Oaks
Glen Oaks Park
Castlewood Park
Golf Course
Cathedral College
Our Lady of the Snows Sch
Glen Oaks Sch
Jr High Sch No 172
Glen Oaks PO
Library
Fire Sta
Parkville
Notre Dame Sc
North New Hyde Park
INTERCHANGE 21
INTERCHANGE 22
INTERCHANGE 23
INTERCHANGE 24
INTERCHANGE 25
INTERCHANGE 33
INTERCHANGE 34
NEW YORK CITY BOUNDARY
NASSAU EXPRESSWAY
NORTHERN BLVD
UNION TPKE
JERICHO TPKE
GRAND CENTRAL PKWY
CROSS ISLAND PKWY
LONG ISLAND EXPRESSWAY
NASSAU QUEENS CO
TNPK
Parking
Park
BM 87
BM 130
BM 208
BM 151
BM 128
BM 134
BM 126
BM 104
BM 122
BM 125
BM 128
WT
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25 - MILE RADIUS
20 - MILE RADIUS
15 - MILE RADIUS
LAKE SUCCESS
GLEN OAKS
NASSAU
QUEENS
Village of Lake Success Park
Village of Lake Success Golf Course
Lake Success
Lake Surprise
Lakeville School
Fresh Meadow Country Club
North Shore Hospital
Deepdale Golf Club
High Sch
Great Neck Public Schools
Junior High Sch
Lake Success Jewish Center
North Shore Towers
Astoria Federal Savings
FORMER UNISYS FACILITY
Park
Pool
Glen Oaks Road
Fuller School
Long Island Jewish Hospital
Lake Success Shopping Center
Parksville Sch
Manor Oak Sch
Douglaston Park Golf Course
N SERVICE RD
I U WILLETS RD
NORTHERN BLVD
GRAND CENTRAL PKWY
UNION TURNPIKE
MARCUS AV
LAKEVILLE RD
SHELTER ROCK RD
COMMUNITY DR
EXECUTIVE DR
CORPORATE DR
OMEGA PLAZA
DW-100
DW-101
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Section 1
Introduction

ARCADIS of New York, Inc. (ARCADIS) has prepared this *Feasibility Study, Operable Unit 2* (FS Report) on behalf of Lockheed Martin Corporation (Lockheed Martin) for the off-site groundwater plume located near the former Unisys Corporation (Unisys) Facility located at 1111 Marcus Avenue (formerly 365 Lakeville Road) in Great Neck, New York (site; Figure 1-1). The FS Report was prepared pursuant to the requirements of the November 1991 New York State Department of Environmental Conservation (NYSDEC) Administrative Order on Consent (Consent Order No. W-1-0527-91-02; NYSDEC 1991) and was prepared in accordance with the following documents:

- *OU-2 RI/FS Work Plan* (H2M Group [H2M] 1998)
- *OU-2 RI Work Plan* (ARCADIS 1999)
- *Guidance for Conducting RI/FS Studies Under the Comprehensive Environmental Response, Compensation, and Liability Act* (United States Environmental Protection Agency [USEPA] 1988a)
- NYSDEC Technical and Administrative Guidance Memorandum HWR 90-4030, titled *Selection of Remedial Actions at Inactive Hazardous Waste Sites* (NYSDEC 1990)
- NYSDEC *DER-10 Technical Guidance for Site Investigation and Remediation* (DER-10; NYSDEC 2010b)
- NYSDEC *DER-31 Green Remediation* (DER-31; NYSDEC 2010c)

This FS Report evaluates the potential application of various remedial actions for the off-site volatile organic compound (VOC) groundwater plume that comprises the Operable Unit 2 (OU-2) area.

1.1 SITE BACKGROUND

NYSDEC has classified the site as a Class 2 site on the Registry of Inactive Hazardous Waste Disposal Sites in New York State (Site No. 130045). A Class 2 site is defined as a hazardous waste site that poses significant threat to public health or the environment and requires remedial action (NYSDEC 2010a). To facilitate remediation before complete characterization of the site and surrounding area, NYSDEC divided the site into two operable units (OUs): Operable Unit 1 (OU-1) and OU-2. OU-1 encompasses soils and groundwater within the 94-acre on-site area, which is owned by Apollo Lake Success Property, LLC and 1111 Marcus Avenue Unit 2 Owner, LLC. In March 1997, NYSDEC issued a Record of Decision (ROD) for the remediation of OU-1 to address VOCs in on-site soils, sediments, and groundwater. The ROD (NYSDEC 1997) called for the design, installation, and operation of a groundwater pumping with treatment (P&T) system and a soil vapor extraction (SVE) system to address residual site-related constituent of concern (COC) impacts from a former dry well source. The OU-1 ROD (NYSDEC 1997) required fencing and a deed restriction for the area containing the stormwater retention basins.

Operable Unit 2 consists of the off-site area and is the subject of this FS Report. Characterization and remediation of off-site groundwater has been ongoing since the mid-1990s under purview of NYSDEC. Remedial investigation (RI) activities for site-related COCs in off-site groundwater have been completed and the *Remedial Investigation Report, Operable Unit No. 2 for the Unisys Site, Great Neck New York* (OU-2 RI Report; ARCADIS 2012) was submitted to NYSDEC on May 30, 2012. To minimize off-site migration and enhance mass reduction, an interim remedial measure (IRM) was completed in 2004 to address site-related COCs in the off-site groundwater plume. The IRM consisted of the design, installation, and operation of a P&T system to capture contaminant mass in an area of elevated VOC concentrations north of the site.

1.2 PURPOSE

The general purpose of the FS process for OU-2 is to evaluate remedial action alternatives (RAAs) that will protect public health and the environment from site-related COCs detected in off-site groundwater. Specifically, this FS Report summarizes the remedial goals and remedial action objectives (RAOs) developed for OU-2, evaluates and screens remedial technologies, develops and evaluates applicable RAAs, and recommends a final remedy for implementation. The RAOs

and RAAs are based on information obtained from the OU-2 RI Report (ARCADIS 2012), including the nature and extent of contamination, performance characteristics of the OU-2 IRM, qualitative human health exposure assessment (HHEA) and ecological evaluation, and computer-based fate and transport modeling, which produced projections through time of the movement of the contaminants in response to existing and proposed pumping.

1.3 OBJECTIVE AND SCOPE

The specific objective of the FS process for OU-2 is to identify, evaluate, and recommend an RAA for OU-2 that, when integrated with the OU-1 final remedy, will protect public health and the environment. During the preparation of this FS Report, information from past investigations and ongoing monitoring of previously implemented remedial actions (Section 2) was used to identify appropriate remedial technologies (Section 6) and evaluate RAAs (Section 7). Consistent with NYSDEC guidance, the following criteria were used to evaluate the RAAs considered:

- Overall protectiveness of public health and the environment
- Conformance with standards, criteria, and guidance (SCGs)
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume of contamination through treatment
- Short-term impact and effectiveness
- Implementability
- Cost effectiveness

In addition, all RAAs were evaluated against an eighth criterion, consistency with green remediation principles in accordance with DER-31 guidelines. A ninth criterion, community acceptance, is also used by NYSDEC to select the final remedy, but this criterion is used only after the public involvement process has been completed.

1.4 DOCUMENT ORGANIZATION

This FS Report consists of the nine sections described below, and includes supporting tables, figures, and appendices.

- **Section 1 – Introduction.** Provides a brief background of the site and the purpose, scope, and organization of this FS Report.

- **Section 2 – Site Description and History.** Provides a description and history of the site, including past and current site occupants, buildings and structures, and historical land use.

- **Section 3 – Site Setting and Summary of HHEA.** Describes the surface-water hydrology and regional and local geology/hydrogeology and provides information describing previous RIs and remediation activities conducted at OU-2. This section also provides the results of a HHEA, including pathways of exposure.

- **Section 4 – Remediation Goals and Remedial Action Objectives.** Identifies and discusses the remedial goals, including the RAOs and SCGs for OU-2.

- **Section 5 – General Response Actions.** Presents the estimated volume/mass of impacted media for the site-related COC groundwater plume. This section also identifies the general response actions (GRAs), which include non-technology-specific categories such as treatment, containment, excavation, extraction, discharge/re-use, institutional controls, and/or combinations of these.

- **Section 6 – Identification and Screening of Technologies.** Identifies, screens, and evaluates remedial technologies and process options that are appropriate for OU-2. This section eliminates technologies that do not address the site-related, COC-affected media and/or COCs in OU-2. Technologies retained after this screening step are more fully developed and evaluated in Sections 7 and 8.

- **Section 7 – Development and Analysis of Alternatives.** Assembles the retained remedial technologies and process options into alternatives for detailed consideration as an appropriate remedial approach for OU-2. Evaluates these alternatives with respect to the eight NYSDEC criteria.

- **Section 8 – Recommended Remedy.** Presents a comparative analysis of the alternatives and identifies the preferred RAA.

- **Section 9 – References.** Lists references used in the preparation of this FS Report.

Section 2
Site Description and History

This section provides a brief site description and a summary of the site's operational history.

2.1 SITE DESCRIPTION

The site is located in the Village of Lake Success (VLS) in Great Neck, Nassau County, New York (Figure 1-1). The site is bounded by Marcus Avenue to the north, Union Turnpike to the south, Lakeville Road to the west, and the Triad Business Park to the east. The site occupies approximately 94 acres, on which a main building and several smaller buildings (located south of the main building) exist. The smaller buildings formerly included a foundry building, environmental testing building, boiler building, garage, maintenance shop, and the Lakehouse building. The main building has since been converted to commercial rental space, as have most of the smaller buildings, except for the environmental testing and Lakehouse buildings, which have been demolished. The balance of the site consists of paved areas (parking lots) and three stormwater retention basins. A map showing the site layout is provided on Figure 2-1.

2.2 SITE HISTORY

The site was an active manufacturing and assembly facility from 1941 until early 1999. Heavy manufacturing activities ended in 1995, while some assembly, integration, prototype development and testing, and/or engineering and administrative activities were ongoing at the facility through early 1999. The equipment and machinery were subsequently removed and the building remained idle until 2000.

The facility was originally designed and built by the United States Government and operated under a contract to Sperry Gyroscope Company (Sperry) from 1941 to 1951. In 1951, the site was sold to Sperry, which merged with Burroughs in 1986 to form Unisys. In 1995, Loral Corporation (Loral) acquired assets of Unisys Defense Systems, a division of Unisys. In early 1996, Loral's electronics and systems integration businesses were purchased by Lockheed Martin. The site was

sold by Lockheed Martin in early 2000 to iPark, which has converted the buildings to commercial rental space. The current owner is Apollo Lake Success Property, LLC and 1111 Marcus Avenue Unit 2 Owner, LLC.

In addition to the 94 acres that comprise OU-1, the site also originally included an additional 55 acres located immediately to the east, on which a large manufacturing building was located. This building was demolished and the property was sold to a developer in the 1970s, who constructed the present-day Triad Business Park. Property containing electrical substations, located south of the site, was formerly owned by Unisys; however, the equipment was always owned and operated by the Long Island Power Authority (LIPA), formerly known as the Long Island Lighting Company. Long Island Power Authority leased the property from Unisys until 1992, when LIPA purchased the property from Unisys. The LIPA property is still considered part of OU-1. Additional historical details are provided in the OU-2 RI Report (ARCADIS 2012).

Between 1978 and November 1996, a series of on-site studies were performed to investigate VOC contamination in soil and groundwater. The first study traced the origin of the VOCs to a series of dry wells (subsurface structures constructed for liquid disposal) near the southeast corner of the main building.

In April 1993, a 1,100-gallon-per-minute (gpm) groundwater P&T system was installed by Unisys as an IRM to remove VOCs in groundwater at the northern site boundary. In January 1994, an SVE system (also an IRM) was installed in the dry well area to recover residual VOCs in the soil. These investigations and remedial activities culminated in a ROD for on-site soil and groundwater (NYSDEC 1997). In 1998, three dry wells were excavated to a depth of 30 feet, and approximately 800 tons of soil contaminated with VOCs and metals were removed and disposed of off site at an approved facility. The excavation was then backfilled with certified clean sand.

In accordance with the ROD, the SVE system was expanded to address soil and perched water outside in the southeast corner of the main building. A ROD-compliant groundwater treatment system was constructed and began operation in 2001 to replace the OU-1 groundwater IRM treatment system.

The OU-1 remediation system is located in the northeast corner of the site (Figure 2-1) and includes a groundwater treatment plant, three remedial groundwater extraction wells (EW1, RW1RS, and RW1RD), and associated piping located on site along Marcus Avenue. Treated water is conveyed to three off-site diffusion (recharge) wells (DW11, DW12, and DW13) located northeast of the site on property owned by the New York State Office of Parks and Historic Preservation. The wells are designed to return treated water to the aquifer.

Section 3
Site Setting and Summary of Human Health Exposure Assessment and Ecological Evaluation

This section provides geologic and hydrogeologic information about the site, describes groundwater impacts, and summarizes the results of the HHEA. Results of prior groundwater site investigations are discussed in the OU-2 RI Report (ARCADIS 2012).

Groundwater quality and chemistry data have been collected from monitoring wells installed by various consultants or private parties from the mid-1990s to 2008. The groundwater monitoring well network includes recovery wells installed for the OU-1 and the IRM treatment systems, local public supply wells, golf course and other irrigation wells, private wells being used for various purposes, and monitoring wells installed by Unisys, Lockheed Martin, and the Nassau County Department of Public Works (NCDPW).

3.1 SURFACE-WATER HYDROLOGY

Local surface-water bodies include Lake Success and Lake Surprise at the Village of Lake Success Golf Course (VLSGC) north of the site. These lakes are perched and are not connected to the groundwater system. There are also several on-site recharge basins that are not natural surface-water features but rather were constructed to receive stormwater runoff from the site.

On February 21, 1997, an investigation was conducted at Lake Success to determine the depth of the lake bottom (H2M 1998). Depth soundings were recorded along three transects and the depth of the lake was determined to be approximately 4 to 70 feet. Based on water level measurements collected from the monitoring wells located across Lakeville Road (east of Lake Success) on the

Great Neck Public Schools property (South High School and South Middle School), groundwater occurs at approximately 160 feet below land surface (bls) near Lake Success. Therefore, because there are 90 feet or more between the lake bottom and the water table, Lake Success is deemed a perched lake and does not have a direct hydraulic connection with the groundwater system. Although water from Lake Success may percolate down to the water table, no groundwater at the water table or in the groundwater system can move vertically up into Lake Success; thus, Lake Success and other surface-water features are not naturally impacted by underlying groundwater.

3.2 REGIONAL GEOLOGY

Western Nassau County is underlain by unconsolidated deposits and Precambrian Age bedrock. Based on boring logs and geologic publications (Swarzenski 1963) for the surrounding area, the unconsolidated deposits are approximately 700-feet thick and lie upon the bedrock. The unconsolidated deposits consist of the following formations from land surface down (from youngest to oldest): Upper Pleistocene glacial deposits, Late Cretaceous Magothy Formation, and the Late Cretaceous Raritan Formation, which includes the upper clay member and underlying Lloyd Sand unit (Figure 3-1).

The glacial deposits generally consist of stratified, fine to coarse sands and gravel interbedded with silts and thin clay lenses. Based on boring logs from this and previous investigations, glacial deposits at the site are approximately 150-feet thick. The glacial deposits lie upon the Magothy Formation, which is composed primarily of fine to medium sand with silt and clay lenses and a basal coarse sand zone, and is believed to be approximately 250-feet thick. This formation coarsens with depth and overlies the Raritan Formation. The upper clay member of the Raritan Formation consists predominantly of light to dark grey or multicolored clay with some silt and is approximately 150- to 200-feet thick in the study area. The underlying Lloyd Sand unit is approximately 190-feet thick and is composed of light-colored sand and gravel with, in some locations, a clayey matrix. The Lloyd Sand unit unconformably overlies the Precambrian bedrock, which generally consists of gneiss and biotite schist. The bedrock and Magothy and Raritan Formations gently slope (50 feet per mile) to the southeast (Swarzenski 1963).

3.3 REGIONAL HYDROGEOLOGY

The hydraulic conductivity (permeability or K) of the Upper Glacial aquifer (Upper Pleistocene deposits) is higher than that of the underlying Magothy aquifer (Magothy Formation). Horizontal and vertical hydraulic conductivities have been estimated at 270 and 27 feet per day (ft/day), respectively, for the Upper Glacial aquifer, and 50 and 1.4 ft/day, respectively, for the Magothy aquifer (McClymonds and Franke 1972). Average groundwater velocity near the site, when not under the influence of the pumping wells, ranges from approximately 0.3 to 1 ft/day. Published data suggest that the regional groundwater flow direction within the Upper Glacial and Magothy aquifers is to the west or northwest (Swarzenski 1963). According to NCDPW data, the groundwater divide (an imaginary line north of which groundwater generally flows to the north, and south of which groundwater generally flows to the south) occurs approximately 0.5 mile south of Union Turnpike, which is south of the site. Historical groundwater flow figures from 1957, 1961, 1970, 1974, and 1984 show that the regional groundwater flow directions in the study area were consistently to the west or west-northwest on these dates (Swarzenski 1963, Suffolk County Department of Environmental Control 1970, Suffolk County Water Authority 1974, and U.S. Geological Survey 1984 and 1999).

The Magothy aquifer is Long Island's principal aquifer and is the main source of water for public drinking water supply wells. Large users of groundwater in western Nassau County include: Garden City Park Water District, Manhasset-Lakeville Water District (MLWD), Water Authority of Great Neck North (WAGNN), Water Authority of West Nassau County (WAWNC), and several other water suppliers. Reported yields during pumping tests of 90 wells completed in the Magothy aquifer, near North Hempstead, ranged from 300 to 1,500 gpm, with an average of 1,000 gpm.

The Magothy aquifer is underlain by the Raritan Clay, which is considered a confining unit due to its extremely low vertical permeability and continuous horizontal extent. Based on tests performed during previous investigations and published data (McClymonds and Franke 1972), average vertical permeabilities of the clay unit are approximately 0.001 ft/day. The Raritan Clay is considered to be a very low-permeability unit and defines the bottom of the flow system for the contaminant plume originating at the site.

The Lloyd Sand (Lloyd aquifer) is confined (and isolated from the Upper Glacial deposits and Magothy Formation) by the overlying Raritan Clay. Regionally, groundwater in the Lloyd aquifer flows to the southwest. The Lloyd aquifer flow direction is in contrast with the northwesterly flow direction of the Magothy aquifer, indicating that the two units are not hydraulically connected. The Lloyd aquifer, to a lesser extent than the Magothy aquifer, is used as a water supply in the Nassau/Queens County area. Large users of the Lloyd aquifer in western Nassau County include WAWNC, WAGNN, and MLWD. (Both WAGNN and MLWD also withdraw water from the Magothy aquifer.) Horizontal hydraulic conductivities of the Lloyd aquifer are estimated at 40 ft/day, and the vertical permeability is approximately 7 ft/day. Based on published data, yields during pumping tests of wells completed in the Lloyd aquifer ranged between 500 and 1,600 gpm (Swarzenski 1963, McClymonds and Franke 1972).

At some locations on Long Island, the Magothy aquifer is confined by a clay layer that separates the glacial and Magothy sediments. However, this condition does not exist in western Nassau County, and the contact between the two units is not sharply defined. In western Nassau County, these two geologic units (Upper Glacial and Magothy) are directly connected and can be considered a single unconfined to semiconfined hydrogeologic unit.

3.4 LOCAL HYDROGEOLOGY

To identify receptors that could potentially be exposed to site-related, COC-affected groundwater, ARCADIS conducted a survey of wells within a 1.5-mile radius and 2.5-mile area downgradient of the site; results of the survey are summarized in Table 3-1 and are illustrated on Figure 3-2. Based on the survey data, numerous pumping and diffusion (recharge) wells are located within the inventoried area. In addition, three remedial extraction wells (EW1, RW1RS, and RW1RD) and five diffusion wells (DW9, DW10, DW11, DW12, and DW13) were operating at the site as part of the OU-1 groundwater remedial system during the OU-2 RI; however, DW9 and DW10 are no longer in service. Several entities use the groundwater beneath OU-1 and OU-2. Four golf courses use the groundwater for irrigation: Deepdale Golf Club (DGC), Fresh Meadow Country Club (FMCC), VLSGC, and North Shore Towers (NST). Several other entities such as municipal water suppliers and commercial users (for cooling purposes) also use the groundwater.

Operation of these wells has modified the groundwater flow directions and gradients in the area and affected, to some extent, the plume distribution off site. Because water levels could not be measured in all of these pumping and diffusion wells, the potentiometric surface maps prepared for this FS Report and discussed below summarize only the available data. The pump and discharge rates for the wells in the 1.5-mile radius and 2.5-mile area downgradient were incorporated into the groundwater model developed for the site (ARCADIS 2012).

The data collected in support of the OU-2 RI show that the local hydrogeology is consistent with regional conditions at the site. The Upper Glacial aquifer is partially unsaturated, with the maximum thickness of the saturated Upper Glacial aquifer being approximately 70 feet near the northeast portion of the site. Beneath the site, groundwater occurs mainly in the Magothy aquifer. There does not appear to be a distinct continuous confining layer between the Upper Glacial and Magothy aquifers beneath the site. Consistent with published information is the presence of the Raritan Clay, which is the confining unit between the Magothy and Lloyd aquifers.

Based on a review of boring logs and interpretation of local hydraulic data and regional flow patterns, the groundwater flow system beneath the site and off site (encompassing the Upper Glacial and Magothy hydrogeologic units) has been divided into four zones for the presentation of water level and water quality data as follows: the Upper Glacial aquifer and the upper, middle, and basal portions of the Magothy aquifer. The Upper Glacial aquifer is defined as extending from land surface (approximately 120 to 140 feet above mean sea level [msl] at the site) to an elevation of approximately -20 feet msl. The upper portion of the Magothy aquifer is defined to range from elevation -20 to -110 feet msl. The middle portion of the Magothy aquifer is defined as an elevation range of -110 to -200 feet msl. The basal portion of the Magothy aquifer is defined as an elevation range extending from -200 feet msl to the top of the Raritan confining unit. These elevations should be considered approximate and generally apply to the hydrogeologic system near the site.

Potentiometric surface maps of the Upper Glacial aquifer (Figure 3-3a), along with the upper, middle, and basal portions of the Magothy aquifer (Figures 3-3b, 3-3c, and 3-3d, respectively), have been prepared from the January 11, 12, and 13, 2010, water level measurement event (water level measurements were collected from on- and off-site monitoring wells). Both the OU-1

Remedial System and the OU-2 IRM were operating during this event. The effects of pumping and diffusion from both remedial systems is seen on the maps as water levels indicating both cones of depression and mounding. Beyond the capture zones created by the recovery wells or the groundwater mounds created by the diffusion wells, the general groundwater flow is north-northwest and is locally influenced by the pumping of public supply wells.

3.5 VERTICAL HYDRAULIC GRADIENTS

Previous sections of this FS Report discussed the horizontal component of groundwater flow in the Upper Glacial aquifer and the upper, middle, and basal portions of the Magothy aquifer. Vertical hydraulic gradients were evaluated to assess the vertical component of groundwater flow.

Using data from synoptic groundwater measurement events in March 2006 and January 2010, vertical gradients were calculated by well cluster for each event. Gradients were determined between the Upper Glacial aquifer and the upper portion of the Magothy aquifer, the upper and middle portions of the Magothy aquifer, and the middle and basal portions of the Magothy aquifer. Vertical gradients were calculated for each clustered pair of wells screened in the appropriate zones by subtracting the water level elevation in the deeper well of each pair from the water level elevation of the shallower paired well and dividing the difference by the vertical distance between the mid-points of the well screens. A positive number indicates a downward vertical gradient and a negative number indicates an upward vertical gradient. Table 3-2 contains the vertical gradient data. In general, the vertical gradients at and in the area of the site are downward; however, locally active pumping wells can reverse the gradient. This section evaluates gradients measured at well clusters and presents head data and likely flow directions in well clusters that are near the OU-1 and OU-2 remedial extraction wells.

Ten clustered well pairs are included in Table 3-2 to evaluate the vertical component of flow between the Upper Glacial aquifer and the upper portion of the Magothy aquifer. Eight of the 10 clusters showed a downward flow component (positive gradient) during both measurement events (except for clusters MW1 and MW16 in 2006 and MW16 and MW28 in 2010), which is consistent with the conceptual model regarding vertical flow direction over the OU-1 and OU-2 areas. Data collected at cluster MW1 indicated a head difference of only 0.02 foot, essentially showing no gradient. The exception to the general downward gradient is at cluster MW28, where the

calculated gradient is negative (upward). These measurements are considered anomalous (measurement error). Reversal of the gradient between 2006 and 2010 in cluster MW16 is likely a function of the startup of the OU-2 groundwater IRM. The system was off in 2006 and operating in 2010. The pumping stress of RW100 is likely responsible for this gradient reversal.

Nine clustered well pairs are included in Table 3-2 to evaluate the vertical component of flow between the upper and middle portions of the Magothy aquifer. Six of the clusters exhibited a positive gradient (indicating downward flow), while three clusters exhibited a negative gradient. In all cases, the clusters indicating negative gradients are those influenced by either pumping or diffusion wells. Cluster MW30 is adjacent to the OU-1 diffusion wells. The diffusion well screens are located in the middle and basal portions of the Magothy aquifer. Discharge to these wells increases the head at depth and has reversed what would be a slightly downward flow condition to one that is significantly upward. Cluster MW1 is located near the OU-1 extraction wells. Cluster MW1 well screens are at the same horizon and below the OU-1 extraction well screens. The head measured in the monitoring well screen that is at the same horizon as the extraction well screen is expected to decrease more than that measured in the deeper well due to the pumping influence. As indicated in Table 3-2, the gradient is negative, indicating upward flow. Cluster MW43 measurements indicate a negative gradient and upward flow that may be influenced by the multiple screen zones of the nearby WAGNN supply wells in the Magothy aquifer.

Six clustered well pairs are included in Table 3-2 to evaluate the vertical component of flow between the middle and basal portions of the Magothy aquifer. In 2006, four of the clusters indicated a positive gradient. Cluster MW12, which exhibits a negative gradient, is likely influenced by shallower pumping from the nearby OU-1 extraction wells. It is uncertain why the gradient is negative in cluster MW5; the measurement may be an error. In 2010, three of the clusters indicated a positive gradient. As indicated by the 2006 data, cluster MW12 is likely influenced by the nearby OU-1 extraction wells. The vertical gradient at cluster MW39 is negative (upward) due to the startup of the OU-2 IRM extraction well. The calculated gradient from cluster MW39 has been reversed from 2006 to 2010 in direct response to the OU-2 IRM system startup.

3.6 PREVIOUS SITE INVESTIGATIONS AND REMEDIAL ACTIVITIES

Since 1978, several investigations and remedial activities have been implemented at the site. Details of the on-site investigations and remedial activities are provided in the OU-2 RI Report (ARCADIS 2012).

3.7 SUMMARY OF OPERABLE UNIT 2 REMEDIAL INVESTIGATION ACTIVITIES

As part of the OU-2 RI, 53 monitoring wells were installed to characterize the nature and extent of site-related COCs in off-site groundwater. Wells were generally installed in clusters of two to three wells and were screened in either the Upper Glacial aquifer (wells designated with a "GL" suffix), the middle or "intermediate" portion of the Magothy aquifer (wells designated with an "MI" suffix), or the basal portion of the Magothy aquifer (wells designated with an "ML" suffix).

To further define the off-site plume to the north and northwest, various consultants installed numerous additional monitoring wells. Between June and October 1998, four 3-well clusters (12 monitoring wells designated as monitoring wells 30GL, 30MI, 30ML, 31GL, 31MI, 31ML, 32GL, 32MI, 32ML, 33GL, 33MI, and 33ML) were installed off site. ARCADIS installed three additional three-well clusters (monitoring wells 37MU, 37MI, 37ML, 38MU, 38MI, 38ML, 39MU, 39MI, and 39ML) from June through October 1999 at off-site locations. An additional 25 monitoring wells (primarily installed as two- or three-well clusters) have been installed at various times and locations for additional plume monitoring. In 2008 and 2009, five 2-well clusters (monitoring wells 47MI, 47ML, 48MI, 48ML, 49MI, 49ML, 50MI, 50ML, 51MU, and 51ML) were installed to complete plume delineation/monitoring efforts.

The wells installed within the Upper Glacial and Magothy aquifers during the OU-2 RI activities were purged and sampled from June 2009 through January 2010. Details regarding the monitoring activities are presented in the OU-2 RI Report (ARCADIS 2012). The nature and extent of site-related, COC-affected groundwater is summarized below.

3.8 NATURE AND EXTENT OF GROUNDWATER CONTAMINATION

The following sections discuss the groundwater quality analytical data collected for the OU-2 RI during the June 2009 through January 2010 sampling event. In accordance with the NYSDEC-approved OU-2 RI Work Plans (H2M 1998 and ARCADIS 1999), groundwater samples were collected from on- and off-site monitoring wells, irrigation wells, and municipal supply wells and analyzed for the Target Compound List (TCL) VOCs and Freon 113. Although additional sampling events have been conducted, this data set represents the most comprehensive sampling event depicting current conditions. The nature and extent of VOCs detected are described in the following subsections. Where appropriate, the compound concentrations in groundwater have been compared to SCGs, which for groundwater are health-based standards, such as USEPA Maximum Contaminant Levels (MCLs) for potable water. Section 4 provides a detailed explanation of the NYSDEC SCGs.

The concentrations of VOCs detected in groundwater during the June 2009 through January 2010 sampling event are provided in Table 3-3. The following four compounds are considered to be the primary site-related COCs for off-site groundwater:

- cis-1,2-dichloroethene (cis-1,2-DCE)
- trichloroethene (TCE)
- tetrachloroethene (PCE)
- Freon 113

These COCs have similar mobilities in groundwater and collectively make up the majority of the average total concentration of VOCs detected in OU-2 groundwater.

Each of the following sections describe the total VOC (TVOC) distribution in the Upper Glacial and Magothy aquifers and summarize peak concentrations in each of the zones. In addition, individual constituents detected are compared to SCGs.

The areal extent of the TVOC plume in the Upper Glacial aquifer, and the upper, middle, and basal portions of the Magothy aquifer, based on the June 2009 through January 2010 data, is

shown on Figures 3-4a through 3-4d, respectively. These figures present the TVOC concentrations within each zone and delineate, as appropriate, TVOC isoconcentrations of 5, 100, 500, and 1,000 micrograms per liter (µg/L). These figures also show concentrations for four of the primary site-related COCs (cis-1,2-DCE, TCE, PCE, and Freon 113).

3.8.1 Upper Glacial Aquifer

TVOC concentrations detected in the Upper Glacial aquifer in June 2009 through January 2010 are shown on Figure 3-4a. The TVOC plume, as defined by the 5 µg/L contour, encompasses approximately the entire site (with the exception of the southwest corner) and extends off site approximately 1,400 feet north of Marcus Avenue and approximately 2,500 feet west of Lakeville Road.

At the southern end of the site, the only 2009/2010 detected VOC concentrations exceeding SCGs were for cis- and trans-1,2-dichloroethene (5 µg/L) in the groundwater sample collected from monitoring well 3GL. In 2009/2010, in the north-central portion of the site at monitoring well 29GL, the VOCs having concentrations exceeding SCGs were cis-1,2-DCE (21 µg/L), TCE (9 µg/L), and PCE (10 µg/L). Off site to the northwest, TVOC concentrations of 260 and 130 µg/L were detected in monitoring wells 18GL and N10290, respectively. To the north, no VOCs were detected in monitoring well 16GL. To the west, monitoring well 33GL yielded no detectable site-related constituents. The southwest corner of the site continues to show no VOC impacts above SCGs (monitoring wells 5GL, 5GU, 6GL, 19GU, 21GU, and 36GL). The peak on-site TVOC concentration was detected in monitoring well 28GL (2,700 µg/L); off site, the peak concentration was detected in monitoring well 18GL (260 µg/L), located approximately 400 feet northwest of the intersection of Marcus Avenue and Lakeville Road.

Based on the available data, operation of the OU-1 groundwater remedy appears to have controlled the northerly off-site migration of the plume in the Upper Glacial aquifer. All available data also indicate that the plume is not migrating to the south. Portions of the off-site plume that are not contained by on-site remedial wells EW1 and RW1RS will migrate along the general direction of groundwater flow (to the northwest and vertically down into the Magothy aquifer).

3.8.2 Upper Portion of the Magothy Aquifer

TVOC concentrations detected in the upper Magothy aquifer from June 2009 through January 2010 are shown on Figure 3-4b. Volatile organic compounds were detected (and/or inferred based on our understanding of past and present groundwater flow directions) across the entire site, along with off-site areas north, northwest, west, and south of the site. The TVOC plume, as defined by the 5 µg/L contour, encompasses the site and extends off site approximately 6,200 feet north of Marcus Avenue and approximately 4,800 feet west of Lakeville Road.

In 2009/2010, at the southern end of the site, the following VOCs were detected at concentrations in excess of SCGs at monitoring well 11GL: cis-1,2-DCE (210 µg/L), TCE (24 µg/L), PCE (57 µg/L), and Freon 113 (21 µg/L). In the north-central portion of the site, at monitoring well 29MI, the VOCs having concentrations exceeding SCGs were cis-1,2-DCE (160 µg/L), TCE (24 µg/L), and PCE (26 µg/L). Of the 22 off-site wells sampled from the upper portion of the Magothy aquifer, 16 wells yielded at least one constituent that exceeded SCGs. In the June 2009 through January 2010 groundwater sampling event, the peak on-site TVOC concentration detected in the upper portion of the Magothy aquifer was 500 µg/L in monitoring well 23MI; off site, the peak concentration was found in monitoring well 16ML (580 µg/L), located approximately 2,000 feet north of Marcus Avenue and 300 feet east of Lakeville Road.

In general, the off-site portion of the plume is migrating to the northwest. However, just north of the site, it is clear that the off-site groundwater VOC concentrations are declining as a result of operation of the on-site remedial system. A clear separation of the area of VOCs exceeding 500 µg/L is evident on the north side of Marcus Avenue (Figure 3-4b). This indicates that the on-site remedial system is effectively containing on-site VOCs and preventing off-site migration. The effects of pumping also are evident near the North Shore Long Island Jewish Hospital (NSLIJH). Water Authority of Great Neck North wells N12999 and N13000 (located just east of the hospital) are actively pumping water for public supply purposes. The impact these wells have on the plume is seen as the 5 µg/L TVOC contour is deflected toward the pumping wells. To ensure that all water supplied to the public meets the required standards, WAGNN operates and maintains a groundwater treatment plant at the well site.

3.8.3 Middle Portion of the Magothy Aquifer

TVOC concentrations detected in the middle portion of the Magothy aquifer from June 2009 through January 2010 are shown on Figure 3-4c. The TVOC plume, as defined by the 5 µg/L contour, encompasses the entire site and extends off site approximately 6,000 feet north of Marcus Avenue and approximately 4,800 feet west of Lakeville Road.

From June 2009 through January 2010 at the southern end of the site, the following VOCs were detected at concentrations above SCGs in monitoring wells 11MI and 19MI, respectively: cis-1,2-DCE (370 and 450 µg/L), TCE (69 and 110 µg/L), PCE (68 and 84 µg/L), and Freon 113 (15 and 17 µg/L). In the northwestern corner of the site, at monitoring well 7ML, the VOCs having concentrations exceeding SCGs were cis-1,2-DCE (290 µg/L), TCE (57 µg/L), PCE (60 µg/L), and Freon 113 (13 µg/L). Of the 19 off-site wells sampled from the middle portion of the Magothy aquifer, 12 wells yielded at least one constituent at concentrations above SCGs. Results from monitoring well 49MI (to the south) and irrigation supply wells N5535 and N2169 (to the northeast and north, respectively) did not exceed SCGs. During the June 2009 through January 2010 groundwater sampling event, the peak on-site TVOC concentration detected in the middle portion of the Magothy aquifer was 670 µg/L in monitoring well 19MI; off site, the peak concentration was found in monitoring well 38MI (910 µg/L), located approximately 1,200 feet north of Marcus Avenue and 50 feet west of Lakeville Road.

Consistent with the concentration distributions already presented, the distribution in the middle Magothy horizon indicates general plume migration to the northwest, except in local areas affected by current pumping. Similar to the other horizons, the historical hydraulic effects of aquifer pumping are visible in the shape and extent of the current plume.

3.8.4 Basal Portion of the Magothy Aquifer

TVOC concentrations detected in the basal portion of the Magothy aquifer during the June 2009 through January 2010 sampling event are shown on Figure 3-4d. The TVOC plume, as defined by the 5 µg/L contour, encompasses the entire site, with the exception of the eastern portion of the site, and extends off site approximately 4,800 feet north of Marcus Avenue and approximately 6,000 feet west of Lakeville Road.

In 2009/2010, at the southern end of the site, the following VOCs were detected at concentrations above SCGs in monitoring wells 5ML and 3ML, respectively: cis-1,2-DCE (88 and 290 µg/L), TCE (41 and 95 µg/L), PCE (12 and 46 µg/L), and Freon 113 (5 and 17 µg/L). In the north-central portion of the site at monitoring well 1ML, the VOCs having concentrations exceeding SCGs were cis-1,2-DCE (84 µg/L), TCE (39 µg/L), PCE (26 µg/L), and Freon 113 (10 µg/L). Of the 16 off-site wells sampled from the basal portion of the Magothy aquifer, eight wells yielded at least one constituent detected above SCGs. No VOCs with concentrations above SCGs were reported from monitoring wells located to the south of the site (48ML, 49ML, and 50ML). This clearly indicates that the southern extent of the plume is near Union Turnpike and that the direction of migration is not to the south.

As in the shallower aquifer horizons, the 2009/2010 TVOC concentrations detected in monitoring wells indicate that the plume is migrating to the north-northwest following the general groundwater flow direction.

3.8.5 Lloyd Aquifer

Analytical data from former Municipal Supply Well N1802, Municipal Supply Well N12802, and Monitoring Well N-12450 indicate that the COPCs from the former Unisys facility present in the overlying aquifer are not present in the Lloyd aquifer. Municipal Supply Well N1802 was located in the southwest corner of the site. The work performed in July 1996 to repair a hole in the casing of this well appears to have successfully eliminated the source of VOCs. No site-related compounds had been detected in this well since it was repaired. In the summer of 2011, a Lloyd aquifer replacement well (N13794) was installed at the former N1802 location. This well is now online and does not show impacts from site-related COPCs. These data, evaluated in conjunction with the documented groundwater flow within the aquifer system, show that site-related COPCs in the overlying Glacial and Magothy aquifers have not migrated into or impacted the Lloyd aquifer.

3.8.6 Summary of TVOC Groundwater Impacts

Groundwater beneath and in the vicinity of the site is affected by VOCs that are present at concentrations in excess of SCGs. The primary site-related COCs for on-site (OU-1) and off-site (OU-2) groundwater are similar and include cis-1,2-DCE, TCE, PCE, and Freon 113. On average,

cis-1,2-DCE accounts for approximately 65% of the VOCs in the groundwater. In general, TVOC-impacted groundwater was detected in the Upper Glacial aquifer as well as the upper, middle, and basal portions of the Magothy aquifer both on site and off site. Total VOCs related to the site were not detected in groundwater samples collected from the Lloyd aquifer.

Figure 3-5 identifies the vertical extent of TVOC-impacted groundwater in the study area. Three cross-sections are shown on Figure 3-5 to illustrate the subsurface geology and groundwater quality (June 2009 through January 2010 TVOC data) in a northwest-southeast orientation (A-A'), a north-south orientation (B-B'), and an east-west orientation (C-C'). These sections, when viewed in conjunction with the concentration distribution maps (Figures 3-4a through 3-4d), provide the information and spatial relationships necessary to understand the three-dimensional distribution of TVOCs in groundwater.

Cross-section A-A' shows that:

- High TVOC concentrations (in excess of 1,000 µg/L) remain on site near the former dry well area (monitoring well 35GL).
- As a result of the operation of the OU-1 groundwater remedial system (extraction well EW1), an area exhibiting low-level TVOC impacts exists north of Marcus Avenue near the North Shore Parkway, indicating the hydraulic benefits of operation of the remedial system.
- In general, the TVOC plume sinks vertically, moving northwest away from the site and following the natural groundwater flow direction and hydraulic gradients (downward).
- The TVOC plume has its farthest extent in the middle and basal portions of the Magothy aquifer, extending north of the Long Island Expressway (LIE).
- The southern extent of the plume is just south of Union Turnpike.

Cross-section B-B' shows that:

- Operation of the OU-1 groundwater remedial system has resulted in an area of low-level TVOCs near Marcus Avenue, indicating the beneficial impact of the containment wells.
- The TVOC plume has migrated to the north and vertically downward as it moves north, away from the site.
- The TVOC plume has its farthest extent in the middle and basal portions of the Magothy aquifer, extending north beyond the LIE.

- The southern extent of the plume is just to the south of Union Turnpike.

Cross-section C-C' is oriented in the east-to-west direction and groundwater flow is generally perpendicular to the section. The section shows that:

- Operation of the OU-1 remedial system has resulted in a low-level TVOC area in the upper portions of the groundwater system near the site.
- The western extent of the TVOC plume is near the NST area (cluster MW33) within the middle and basal portions of the groundwater system (TVOCs detected in monitoring well 33GL are not site-related compounds).
- The distribution, shape, and extent of the plume in this section largely reflect a historical groundwater flow condition. This occurred during extensive pumping in Queens County for public water supply, resulting in a distinct flow direction from Nassau County to Queens County. The extent of the plume to the west is a direct result of this previous pumping condition. The pumping practice in Queens County has since ceased.

3.9 OPERABLE UNIT 2 INTERIM REMEDIAL MEASURE

The conceptual off-site (OU-2) IRM is documented in the NYSDEC-approved *OU-2 IRM South System Groundwater Remediation Work Plan* (ARCADIS 2003). The goals of the OU-2 IRM are to protect public drinking water wells and minimize further contaminant migration into the North Hills Special Groundwater Protection Area. Construction of the off-site OU-2 IRM system was completed in June 2004 and upgraded in 2005 and 2006 with additional fail-safe systems. Initial testing of the off-site IRM was conducted from July to October 2004. Since startup in 2006, the system has removed approximately 8,100 pounds of VOCs (through March 2010) from the groundwater.

In the OU-2 IRM system, VOC-affected groundwater is extracted from the Magothy aquifer and pumped through a subsurface dual-wall containment pipeline to the OU-2 IRM groundwater treatment system for treatment prior to being recharged to the aquifer. Specifically, groundwater is extracted from one recovery well (RW100), which is located on the Great Neck Union Free School District (UFSD) property, to capture groundwater where off-site VOC concentrations are highest and pumped to a treatment plant. The treatment consists of air stripping (through two air strippers that are arranged in series) to remove VOCs from the groundwater. The treated

groundwater is then pumped through a single-walled subsurface pipeline to the diffusion (recharge) wells, where it is reintroduced into the Magothy aquifer. In accordance with the Non-Detect Performance Standard listed in the *Remediation Access and Licensing Agreement* (Lockheed Martin 2003) between Lockheed Martin and Great Neck UFSD, the concentrations of project-related VOCs in the treated groundwater are reduced to below their respective laboratory quantification limits.

3.10 VILLAGE OF LAKE SUCCESS GOLF COURSE IRRIGATION WATER TREATMENT SYSTEM

The VLSGC irrigation pond (also known as Lake Surprise) is used as a water source for watering the VLSGC, located downgradient of the site, by pumping pond water to the golf course irrigation system. During the majority of the irrigation season (i.e., May through September), Lake Surprise provides an adequate supply of irrigation water. However, during times when natural precipitation and surface-water runoff are insufficient to maintain the volume of water necessary for golf course irrigation, Lake Surprise is supplemented with groundwater pumped from the golf course irrigation well (N8038). Based on historical groundwater data collected by ARCADIS between 1997 and 2009, site-related COCs (mainly cis-1,2-DCE, PCE, and TCE) have been detected in this well. Because of the presence of these COCs, NYSDEC has ordered Lockheed Martin to provide treatment of the water to avoid contaminating the surface water in Lake Surprise. An "on call" groundwater treatment system was designed for short-term, temporary operation to provide VLSGC with a reliable source of irrigation water during drought periods. This system was successfully installed and operated during the 2010 irrigation season and can be reinstalled in future years as needed based upon drought conditions.

3.10.1 General System Overview

The groundwater treatment system will only be deployed and operated as needed during periods of extended drought. Lockheed Martin has contracted with suppliers who can deploy the system within 3 weeks of VLS's determination that the system is needed. When and if needed, it is expected that the treatment system will generally be used for approximately 2 to 3 months.

The irrigation water treatment system is comprised of extraction well N8038 with a screened interval from 272 to 295 feet bls; a submersible pump designed to deliver approximately 300 gpm

of groundwater; conveyance piping to deliver the extracted groundwater to liquid-phase granular activated carbon (LPGAC) vessels connected in series; and a post-filter unit, which is intended to remove any granular activated carbon (GAC) fines in the treated groundwater before being discharged to Lake Surprise. The treated groundwater is discharged into Lake Surprise in accordance with a site-specific State Pollutant Discharge Elimination System (SPDES) permit.

Prior to the 2011 irrigation season, the existing gravel access road connecting the treatment system staging area to the access gate will be resurfaced with asphalt, and a concrete treatment pad and secondary containment will be constructed to accommodate the temporary treatment system equipment for use during the next extended drought period. A SPDES Construction Permit and a Wetlands Permit will be obtained prior to starting construction activities. Additionally, a site-specific SPDES Discharge Permit will be obtained prior to the next irrigation season. During periods of extended drought when supplemental water is needed to maintain the level in Lake Surprise, the treatment system equipment (LPGAC vessels and post-filter) will be mobilized to the site. Influent double-wall and effluent single-wall high-density polyethylene (HDPE) piping will be installed between the groundwater extraction pump and the treatment system (influent piping) and from the treatment system to the discharge point (effluent piping). The irrigation water treatment system consists of the following:

- **Groundwater Extraction Pump**. A 30-horsepower Grundfos pump was installed in well N8038 to extract groundwater at the design flow rate of approximately 300 gpm. The pump is controlled and connected to various interlocks, including a low well water level alarm to prevent the groundwater pump from pumping dry when the groundwater level approaches the pump intake.

- **Conveyance Piping**. The piping from the down-hole pump outlet in irrigation well N8038 to the wellhead piping is comprised of 4-inch-diameter, Schedule 40 carbon steel drop pipe. A • -inch flexible polyethylene tube is attached to the drop pipe to accommodate the in-well low level switch. Aboveground conveyance piping from the wellhead to the treatment system will be 8- by 4-inch dual-wall HDPE piping. Piping within the treatment system dual-containment area will be 4-inch ethylene propylene diene monomer flexible hose. Additional aboveground conveyance piping (4-inch single-walled HDPE piping) will be installed from the outlet of the treatment system to the existing 6-inch Schedule 40 carbon steel pipe manifold that discharges to Lake Surprise.

- **LPGAC Vessels**. The extracted groundwater will be pumped through LPGAC vessels connected in series using 4-inch flexible ethylene propylene diene monomer hoses. Each LPGAC vessel will be equipped with a pressure-relief device (i.e., either a rupture disk or a

pressure-relief valve) and a manual air release ball valve located on a drop-pipe that is connected to the highest point of each vessel. Breakthrough of COCs through the LPGAC vessels is anticipated after approximately 2 months of system operation at a flow rate of 300 gpm (COC breakthrough was not observed at any time during 2 months of operation during the 2010 irrigation season).

- **Post-Filter**. The treated groundwater will be pumped through a post-filter unit to prevent the accidental release of GAC or GAC fines to Lake Surprise. The post-filter unit will consist of four single-bag housings containing 100-micron (maximum) bag filters arranged in parallel configuration. The post-filters will be equipped with influent and effluent pressure gauges to monitor differential pressure loss across the post-filter.

- **Secondary Containment Berms**. The LPGAC vessels and post-filter unit will be placed within secondary containment berms integrated into the concrete treatment pad. The containment berm will be equipped with a high-level switch that will automatically shut down the groundwater pump when water reaches a high level inside the berm from leaks, spills, or precipitation. Accumulated water will be pumped from the berm and treated by the treatment system prior to being discharged into Lake Surprise.

At the end of each irrigation season that the system is deployed and operated, spent GAC will be profiled and characterized prior to transportation off site for regeneration or disposal. The HDPE piping will be dismantled and removed from the site and the LPGAC vessels and post-filter will be demobilized.

3.10.2 System Operation in 2010

The VLSGC irrigation water treatment system was operated between August 6 and September 29, 2010. The system treated groundwater at an average flow rate of approximately 300 gpm with minimal interruptions, reflecting an "up-time percentage" of approximately 80%. During that period, approximately 19 million gallons of groundwater was treated and discharged into Lake Surprise. Total influent VOC concentrations ranged between approximately 350 and 450 µg/L, with cis-1,2-DCE being the predominant VOC detected (concentrations ranging between 220 and 300 µg/L). Volatile organic compound breakthrough was first observed in the primary LPGAC vessel effluent after approximately 4 weeks of continuous operation. However, no VOCs were detected in the tertiary (final) LPGAC vessel effluent (i.e., treatment system effluent) during the operational period.

3.11 HUMAN HEALTH EXPOSURE ASSESSMENT

The HHEA characterizes potential human health exposures associated with off-site migration of site-related chemicals in groundwater, assuming that the current OU-2 groundwater IRM is turned off and that no further remediation is undertaken. The OU-2 HHEA was performed in accordance with the NYSDEC (2010b) DER-10 Guidance.

The HHEA focuses on off-site groundwater as the source of site-related chemicals; however, those chemicals have the potential to be transferred to both air and surface soil. The HHEA evaluates potential exposures associated with chemicals in wells that have already been affected or could potentially be affected in the future, as determined by groundwater modeling. The following environmental media were evaluated:

- Spray irrigation water for the NST golf course (irrigation supply wells N2576, N13221, and N13266). Even though irrigation supply well N2576 has been recently taken out of service, previous data available from the well were used to evaluate the risks associated with spray irrigation. Future risks from ambient air were evaluated based on the recent 2009 ambient air data collected from the NST golf course. The ambient air study conducted at the NST golf course has demonstrated that VOCs associated with groundwater are not present in ambient air at concentrations above background. In particular, neither TCE nor PCE were detected in any downwind or upwind ambient air samples. The groundwater fate and transport model predicts that groundwater concentrations at NST will decrease over time. Under these conditions, ambient air concentrations will continue to remain below detection limits and no further analysis is necessary.
- Air, including indoor air, outdoor air, and basement air.
- Sub-slab soil gas.
- Surface soil wetted by spray irrigation at the NST golf course.
- Surface water and sediment from Lake Surprise and Lake Success.

Prior to the installation of the VLSGC treatment system, groundwater, when needed, was pumped from VLSGC irrigation supply well N8038 and discharged into Lake Surprise. Water from Lake Surprise is used to irrigate the VLSGC. For this reason, surface-water and sediment samples were collected from Lake Surprise and Lake Success to evaluate potential exposure from residual chemicals in surface water or sediment. The FMCC and DGC wells are not impacted by the OU-2 groundwater plume. Although modeling indicates that both wells are predicted to be impacted at

very low levels in the future if no OU-2 groundwater remediation is undertaken, modeling results for NST wells are used as a surrogate because the NST wells will continue to have the highest concentrations of site-related constituents.

The well used by the Glen Oaks Community Association (N2604) to fill its swimming pool was also sampled. No site-related VOCs were detected, and groundwater modeling indicates that this well will not be impacted in the future. Consequently, it will not be a complete exposure pathway. All residential properties that overlie the OU-2 plume are connected to the public water supply. Municipal drinking water from wells in the WAGNN (N12999 and N13000) has already been impacted by the groundwater plume and the wells have been equipped with treatment systems. Manhasset-Lakeville Water District well N5099, WAGNN well N13821 (which is scheduled to be online within the next 2 years), and municipal supply wells N4388 and N12796 are predicted by groundwater modeling to be impacted by the plume. Municipal supply wells N4388 and N12796 are already equipped with treatment systems, and WAGNN well N13821 will be equipped with a treatment system before it is activated. In the future, if chemicals are detected in MLWD well N5099 at concentrations above MCLs or Nassau County Department of Health public water supply guidance values, the water will be treated. Because treatment is currently provided on all affected wells or will be provided on wells that are expected to be impacted in the future, groundwater from municipal drinking water wells is not considered in the HHEA because water from these wells does not represent a complete exposure pathway.

Constituents of concern in groundwater, soil, ambient air, indoor air, and sediment were selected based on a comparison to USEPA (2009) Regional Screening Levels (RSLs). New York State Department of Health (NYSDOH 2006) residential background concentrations and site-specific data were also used to screen indoor air and ambient air, as appropriate. Compounds are designated COCs if the maximum detected concentration in each medium exceeds the relevant screening value. Because none of the detected chemicals are essential nutrients, status as nutrients is not used as a basis to screen out potential COCs. All constituents in soil and sediment are present at concentrations below the residential RSL for surface soil and no COCs are identified for these media. Constituents in sub-slab soil gas were not screened, because the exposure point for potential vapor intrusion is indoor air and not sub-slab soil gas. All constituents in indoor air and basement air samples were either present at concentrations below USEPA RSLs for residential air,

below NYSDOH residential background values, or determined to not be site-related. No constituents were detected in surface-water or ambient air samples from the NST golf course. As a result, COCs are only identified for groundwater.

Exposure to groundwater (assuming no remedial action and no treatment) is assumed to primarily occur at the irrigation wells for NST Golf Course (Wells N13221, N13266, and N13889). Potential receptors that may be exposed to groundwater include groundskeepers and golfers at the NST Golf Course. Residents (children and adults) living at the NST condominiums or in other buildings in the OU-2 area are not expected to be exposed to Site groundwater because potable water is supplied to the NST condominiums by New York City.

The only potentially complete current exposure pathway for groundwater is exposure of NST groundskeepers and golfers via incidental ingestion and dermal contact. Inhalation of volatiles is not considered to be a complete exposure pathway because ambient air and indoor air data indicate concentrations are below SCGs. Specifically, groundskeepers may be exposed to groundwater via dermal contact with spray irrigation water as they walk through the damp grass following irrigation and/or incidental ingestion of spray irrigation water during maintenance activities. Given the timing of the spray irrigation and the objective of minimizing disturbance to golfers by spray irrigation, there is very limited potential for golfers to contact COPCs in groundwater via incidental ingestion or dermal contact.

Soil, ambient air, and indoor air exposures are assumed to be insignificant because the data evaluation indicates that VOC concentrations in soil, sub-slab vapor, and indoor air samples are lower than their associated screening criteria. North Shore Towers residents are not exposed to groundwater, because all potable water is supplied by New York City.

The groundwater fate and transport model described in the OU-2 RI Report (ARCADIS 2012) was also used to evaluate the potential for site-derived chemicals in groundwater to affect NST golf course supply wells in the future, assuming that the current IRM is turned off and no further groundwater remediation is conducted. In other words, the HHEA assumes that the OU-2 plume is allowed to migrate without remediation. Results of the groundwater modeling and predicted concentrations at the NST golf course wells are described in Appendix A.

3.12 ECOLOGICAL EVALUATION

Appendix P of the OU-2 RI Report (ARCADIS 2012) presents a preliminary evaluation of potential impacts to ecological resources for Lake Surprise and Lake Success. Recent data indicate that VLSGC irrigation supply well N8038 exhibits elevated concentrations of site-related VOCs, including cis-1,2-DCE, TCE, and PCE, and water from this well was periodically pumped into Lake Surprise to supplement the irrigation system. Volatile organic compounds were determined to be the chemicals of potential ecological concern. Surface-water and sediment samples were analyzed for TCL VOCs, including certain Freon compounds. Twelve locations were sampled in February 2008: nine in Lake Surprise and three in Lake Success.

Lake Surprise and Lake Success are classified as Type C freshwaters by the State of New York (NYSDEC 2008). Analytical results from the surface-water and sediment samples were compared to available and applicable New York water and sediment quality criteria (NYSDEC 1998, 1999). No constituents were detected in the surface-water samples, and four constituents were detected in the sediment samples: acetone, carbon disulfide, methyl ethyl ketone, and toluene. A sediment quality criterion was only available for toluene, and the detected concentrations were below the criterion. All of the detected sediment constituents were considered to be from non-site-related sources because they are not present in the groundwater from irrigation supply well N8038.

The NYSDEC Environmental Resource Mapper (NYSDEC 2008) records no locations of rare plants, animals, or habitats in the immediate site vicinity that would require further investigation. No wetlands, rare species, or other sensitive habitats were observed during the site visit. The ecological value of the pond is expected to be limited due to the lack of natural areas, proximity to residences, and the regularly maintained golf course.

It was concluded that no additional Fish and Wildlife Resources Impact Analysis or other ecological evaluation is needed for the following reasons:

- No constituents were detected in surface water.
- Four constituents were detected in sediments at only very low concentrations. Of the detected constituents in sediment, one was present at concentrations well below the sediment guidelines. Although sediment quality guidelines are not available for the other

three detected constituents, their lack of detection in the groundwater indicates that they are not site-related. No evidence or documentation was found indicating the presence of rare, endangered, threatened, or special concern species on or in the immediate vicinity of the pond or lake. There is also no mechanism for VOCs in sediment or surface water to migrate or otherwise impact any environmentally sensitive areas.

No evidence was found that the discharge of groundwater containing VOCs into the surface waters of the pond has resulted in the migration of contaminants off site. This determination is based on the absence of detectable concentrations of VOCs in the surface waters of Lake Surprise and Lake Success.

Section 4
Remediation Goals and Remedial Action Objectives

This section develops and defines SCGs, RAOs, and preliminary remediation goals (PRGs) that will be used to evaluate the treatment options for OU-2.

4.1 IDENTIFICATION OF POTENTIAL STANDARDS, CRITERIA, AND GUIDANCE

Part of the process of identifying, evaluating, and selecting a remedial approach for a project area is a review of SCGs that may be potentially applicable to the project area and/or contemplated remedial actions. Understanding potential federal, state, and local SCGs assists in identifying remedial objectives for the project area, the type of RAAs that may be appropriate, and the scope and extent to which each retained alternative would be implemented. This section presents the potential SCGs identified for the site.

4.1.1 Definition of Standards, Criteria, and Guidance

"Standards and criteria" are cleanup standards, standards of control, and other substantive environmental requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance. "Guidance" is non-promulgated criteria, advisories, and/or guidance that are not legal requirements and do not have the same status as "standards and criteria;" however, RAAs should consider guidance documents that, based on professional judgment, may be applicable to the project [Part 375-1.10(c)(1)(ii) of Title 6 of the Compilation of Codes, Rules, and Regulations of the State of New York].

Within the context of this FS Report, it is important to consider SCGs and the manner in which they may influence or shape the conceptual design and implementation of the RAAs under

consideration. This allows for the development of each alternative to a reasonably accurate level of detail and provides a common basis for comparison among alternatives.

4.1.2 Types of Standards, Criteria, and Guidance

NYSDEC has provided guidance on applying the SCG concept to the RI/FS process. In accordance with NYSDEC guidance, SCGs will be progressively identified and applied on a site-specific basis as the RI/FS proceeds. The SCGs that have been considered in this FS Report are categorized into the following NYSDEC-recommended classifications:

- **Chemical-Specific SCGs**. These SCGs are typically health- or risk-based numerical values that establish allowable concentrations for each COC within the impacted media (e.g., soil, groundwater). Such SCGs are considered in identifying remedial objectives and the scope of certain RAAs.

- **Action-Specific SCGs**. These SCGs are typically technology- or activity-based requirements or limitations related to actions associated with the performance of project area remediation activities. These types of SCGs typically influence the implementation aspects of a given alternative.

- **Location-Specific SCGs**. These SCGs are restrictions placed on the concentration of hazardous substances or the performance of activities solely because they occur in specific locations. Examples of potential location-specific SCGs include regulations related to activities conducted in floodplains, wetlands, and navigable waters. Location-specific SCGs also include local requirements such as noise mitigation requirements, building permit conditions for permanent or semi-permanent facilities constructed during the remedial activities (if any), sewer discharge permits, street closing policy, and others.

Table 4-1 presents the SCGs that have been identified for this FS Report.

4.2 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES

The following RAOs were developed for OU-2:

1. Continue to protect public health by further mitigating exposure to site-related COCs in groundwater at concentrations in excess of SCGs.

    a. Treat as necessary to ensure that site-related COC concentrations are below SCGs in potable water supplies.

b. Treat as necessary to ensure that site-related COC concentrations pose no unacceptable risk to the public or the environment at irrigation wells.

2. Attain SCGs for site-related COCs in the groundwater to the extent practicable.

   a. Control site-related COC plumes in the OU-2 area to minimize impacts to additional water purveyors.

   b. Restore groundwater quality to the point at which site-related COCs are below SCGs in OU-2.

4.3 PRELIMINARY REMEDIATION GOALS

The PRGs selected for groundwater are the most stringent of the following three SCGs:

- Federal MCLs
- New York State MCLs/Groundwater Quality Standards
- New York State Guidance (Technical Operational and Guidance Series [TOGS 1.1.1]).

Table 4-2 summarizes the numerical values.

Section 5
General Response Actions

This section presents generic response actions that will be considered to address the RAOs for the OU-2 site-related, COC-affected groundwater. This section also estimates the volume of site-related, COC-affected groundwater in OU-2.

5.1 VOLUMES FOR TREATMENT

The dissolved-phase TVOC mass in the OU-1 and OU-2 groundwater system is estimated to be approximately 7,000 and 26,000 pounds, respectively, based upon groundwater modeling information (see Appendix A). The volume of contaminated groundwater is estimated to be 24 billion gallons.

5.2 IDENTIFICATION OF GENERAL RESPONSE ACTIONS

The GRAs provide the framework for specific technologies and process options that must be considered to meet the RAOs for OU-2 groundwater. The following GRAs are considered for OU-2:

- No Action
- Institutional Controls
- Containment
- Removal
- Discharge/Re-Use
- *Ex-Situ* Treatment
- *In-Situ* Treatment

Table 5-1 summarizes the GRAs and associated process options.

5.2.1 No Action General Response Action

The no action GRA provides a baseline for comparison with other alternatives and is required by the National Contingency Plan (NCP) and DER-10 (NYSDEC 2010b) as part of the FS process. The no action GRA includes the continued operation of the OU-1 treatment system and existing institutional controls (e.g., wellhead treatment) at select purveyor wells including the as-needed VLSGC irrigation water treatment system.

5.2.2 Institutional Controls General Response Actions

Institutional controls GRAs include engineering controls, groundwater monitoring, and restrictions on land and/or groundwater use. Use restrictions may include fencing to prevent public contact with affected media or restrictions on well drilling. Engineering controls may include wellhead treatment to prevent ingestion of impacted groundwater and vapor barriers or venting systems in the foundations of new buildings to minimize the potential for migration of volatile constituents into indoor air. Institutional controls are often used in combination with other RAAs.

5.2.3 Containment General Response Actions

Containment GRAs are performed to control the migration of COCs in groundwater. Containment may be required to prevent and/or control site-related, COC-affected groundwater migrating away from a source area from impacting downgradient wells. The main advantage of containment methods is that they can prevent further migration of plumes and allow for COC mass reduction at sites where the source is not determined or is inaccessible or where long-term remedial actions are being developed. Containment technologies that were identified and screened for OU-2 are groundwater P&T systems and vertical barriers.

5.2.4 Removal General Response Actions

Removal GRAs are technologies that remove the impacted medium from the site. The OU-2 impacted medium is groundwater; thus, the removal technology is groundwater extraction or pumping. Process options for groundwater extraction include groundwater extraction wells and groundwater collection trenches. Groundwater extraction cannot be used alone as an individual

GRA because generally, the extracted water must be treated with a treatment technology prior to being disposed of via a discharge/re-use technology.

5.2.5 Discharge/Re-Use General Response Actions

Discharge/Re-Use GRAs are technologies used to manage COC-affected groundwater. Generally, the extracted groundwater is treated prior to being discharged to a publicly owned treatment works (POTW) or storm drain, reinjected into the aquifer, or sent to an off-site treatment facility. Ideally, a beneficial re-use is found for the treated groundwater (e.g., irrigation, drinking water, or process water).

5.2.6 *Ex-Situ* Treatment General Response Actions

Ex-situ treatment GRAs are technologies used to treat the COC-affected media *ex situ*. Examples of treatment GRAs and associated process options include:

- Physical technologies (e.g., air stripping, filtration, reverse osmosis, adsorption)
- Biological (e.g., aerobic and/or anaerobic degradation, suspended growth or fixed-film bioreactors, fluidized bed reactors)
- Chemical – ion exchange, oxidation (e.g., ultraviolet oxidation, ozone, hydrogen peroxide, chlorination), reduction (e.g., polysulfides, hypochlorite), and precipitation.

5.2.7 *In-Situ* Treatment General Response Actions

In-situ GRAs are technologies that treat the COC-affected media in place (i.e., without removing the media). *In-situ* technologies include chemical/physical treatment technologies such as in-well air stripping and *in-situ* chemical oxidation (ISCO); other *in-situ* technologies use biological/ chemical/physical technologies such as air sparging with SVE, permeable reactive barriers (PRBs), enhanced reductive dechlorination (ERD), phytoremediation, and monitored natural attenuation (MNA).

5.3 SUMMARY OF GENERAL RESPONSE ACTION SCREENING

Table 5-1 identifies and screens GRAs and associated process technologies. The GRAs and associated process technologies that cannot be applied to OU-2 groundwater are eliminated from

further consideration. The GRAs and associated process technologies, retained during the GRA screening process and screened further as remedial technologies in Section 6, are summarized below:

- **No Action**. A true no action option cannot be implemented because several remedial systems are already in place and are operating on site and off site (e.g., OU-1 remediation system and OU-2 IRM system). Nevertheless, no action was retained for baseline purposes.

- **Institutional Controls**. Of the institutional controls evaluated, only deed restrictions, groundwater monitoring, and wellhead treatment process options were retained. Fencing was excluded because this process option would not prevent plume migration or access to site-related, COC-affected groundwater. The presence of a large number of high-volume users at and near the site and the lack of an alternative supply render replacing site-related, COC-affected groundwater with an alternative water supply for end user/purveyor impractical.

- **Containment**. The groundwater P&T technology option was retained; however, its implementation will require the installation of a network of groundwater pumping wells to effectively contain the plume. The use of vertical barriers such as slurry walls was deemed not implementable because the aquifer is too deep and unrestricted groundwater flow exists to a depth of several hundred feet.

- **Removal**. The groundwater extraction process option was retained but the collection trench option was not because the aquifer is too deep to implement an effective vertical barrier or permeable trench.

- **Discharge/Re-Use**. The only process options retained under this GRA were injection/SPDES discharge or equivalent and use of the extracted and treated groundwater by a water purveyor or a golf course. The surface discharge process option was not selected for further evaluation because no local surface-water bodies exist in or around OU-2. Also, the volume of groundwater requiring management is too large for disposal at a POTW or for transport and off-site disposal.

- ***Ex-Situ*** **Treatment**. Physical treatment technologies employing volatilization or adsorption processes have been successfully implemented at similar sites and were retained for further evaluation. Biological treatment technologies using aerobic and/or anaerobic microbial cultures were deemed impractical because of the large volume of water that will require treatment, which would require a large land area. The advanced chemical oxidation process option was retained for further assessment because chemical treatment has generally demonstrated its effectiveness at remediating groundwater at similar sites.

- ***In-Situ*** **Treatment**. Several *in-situ* chemical, physical, and biological treatment technologies were identified and evaluated in Section 5.2. Two chemical process options (in-well air stripping and ISCO) were selected for further assessment. Both processes are characterized by a limited radius of influence; hence, a network of stripping wells/injection

points will be required to effectively remediate the plume at the site. Other evaluated process options consisted of a combination of chemical, physical, and biological technologies. PRBs with zero-valent iron (ZVI), ERD, air sparging combined with SVE, phytoremediation, and MNA have all demonstrated varying effectiveness at treating groundwater containing COCs at similar sites and were therefore retained for screening as remedial technologies in Section 6.

Section 6
Identification and Screening of Remedial Technologies

This section identifies and screens the remedial technologies by conducting preliminary and final levels of evaluation and then selecting representative process options. This process focuses on the technologies that directly relate to the GRAs identified in Section 5.2 (summarized in Table 5-1) and will address the SCGs, RAOs, and PRGs discussed in Section 4. The following publications were sources of information for identifying alternative technologies for screening:

- *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (USEPA 1988a)
- *Guidance for Remedial Actions for Contaminated Groundwater and Superfund Sites* (USEPA 1988b)
- *Remediation Technologies Screening Matrix and Reference Guide* (USEPA 1993)
- DER-10 (NYSDEC 2010b)

Alternatives for remediation are developed by assembling combinations of technologies into alternatives that address OU-2 COCs, SCGs, and RAOs on a unit-wide basis. This process identifies and screens potential technologies applicable to each GRA, as presented in Section 5. Technologies that cannot be implemented technically are eliminated during the screening process. Process/treatment options, representative of those technologies retained for consideration, are identified and further evaluated in detail in Section 7.

This section identifies and screens groundwater remediation technologies and process options based on effectiveness, implementability, and relative cost. This screening evaluation is conducted to determine those remediation technologies and options most appropriate for developing RAAs that address the dissolved-phase COCs in OU-2.

Remediation technologies, their specific process options, and a screening evaluation are listed in Table 6-1. Remediation technologies and process options that are not applicable to the COCs and specific conditions within OU-2 are not considered further. Remediation technologies and process options that are potentially applicable are assembled into RAAs and evaluated in detail in Section 7. A final RAA generally comprises several remediation technologies.

6.1 INITIAL SCREENING OF REMEDIAL TECHNOLOGIES

Initial screening first expanded each GRA into a series of technologies and processes available for addressing the remedial requirements. Many available technologies and processes were further subdivided into specific process options. Each of the technologies identified as a part of the GRA was screened against the SCGs and RAOs, considering the expected effectiveness and implementability of the technology.

Technologies and process options under each GRA were identified and screened at a preliminary level in Section 5.2. Some of the process options were eliminated from further consideration to focus the remedial technology and process option screening. Reasons for screening out process options at this stage include the following: the process is impractical to implement, the process does not provide the necessary treatment, or the process is not available.

6.2 CRITERIA FOR SCREENING REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS

Process options within each remedial technology are comparatively evaluated in Table 6-1 against the three criteria of effectiveness, implementability, and cost.

6.2.1 Effectiveness Evaluation

The evaluation of the effectiveness of a process option is based on the following sub-criteria:

- Ability to meet SCGs
- Ability to meet RAOs
- Potential impacts on public health and the environment during implementation of future activities within OU-2

Based on the considerations specified above, process options are categorized as:

- **Effective** if they can meet the RAOs and protect public health and the environment
- **Ineffective** if they cannot meet the RAOs and protect public health and the environment

6.2.2 Implementability Evaluation

Implementability encompasses the technical and administrative feasibility of setting in place a remedial technology and process option(s). This evaluation emphasizes the following:

- Ability to obtain access to properties where components of remedial systems must be installed
- Availability of equipment and skilled manpower to implement the technology
- Ability to obtain necessary permits
- Availability of treatment, storage, and disposal facilities close to the site
- Time period for implementation

Technical implementability pertains to the difficulties associated with the construction and the ability to monitor the effectiveness of the GRAs and process options. Each GRA is given a technical implementability ranking between 1 and 4, with 1 being the most implementable, according to the following:

1. **Implementable** if the technology has been used at similar sites and is commercially available.

2. **Potentially implementable** if demonstrated by bench- or pilot-scale testing, but not adequately proven at full scale for the COCs and site conditions.

3. **Difficult to implement** if the technology has been used at similar sites but there are problems relating to capacity, site characteristics, and permitting and access issues that hamper implementability at the site.

4. **Not implementable** if access cannot be secured, permits cannot be obtained, or site RAOs cannot be achieved within a reasonable time period.

On the other hand, the ability to obtain access to properties where extraction/diffusion wells and treatment system would be installed was the main criterion evaluated as part of the administrative feasibility of the GRAs and process options. The alternative is given a ranking between 1 and 10, with 1 corresponding to the highest administrative implementability, according to the following:

1. No new access agreements are needed.

2. Existing access agreements need to be updated.

3. New access agreements are needed for monitoring.

4. Access is anticipated for all components with major stakeholders.

5. Access is anticipated for major components with major stakeholders, public right of way, and community acceptance; minor construction disruption is expected.

6. Access is anticipated for some major components, public right of way, and community acceptance; major construction disruption is expected.

7. Unknown access for major components, public right of way, and community acceptance; minor construction disruption is expected.

8. Unknown access for major components, public right of way, and community acceptance; major construction disruption is expected.

9. Access is denied for major components, public right of way, and community acceptance; major construction disruption is expected.

10. No known mechanism for gaining access; significant major equipment in residential areas, multiple stakeholders, and major disruptions are anticipated.

The ranking scores for the implementability criteria discussed above (administrative and technical) are added to generate an overall implementability score for each alternative. The overall implementability score has a possible range of 2 to 14, with 2 corresponding to the highest

implementation feasibility. The technical and administrative implementability evaluation of the developed RAAs is summarized in Section 7 (Table 7-2).

6.2.3 Relative Cost Evaluation

Cost plays a role in the screening of process options. Relative capital costs and operation and maintenance (O&M) costs are used in place of detailed estimates during this level of screening. Within each GRA, each technology is evaluated by comparing costs relative to other technologies that achieve similar goals to treat similar compounds (e.g., air stripping would be compared to activated carbon adsorption for treatment of VOCs). Relative costs were provided as **Low**, **Moderate**, or **High**, with the lowest cost defined as low and the highest cost defined as high.

6.3 REMEDIAL TECHNOLOGY SCREENING

6.3.1 No Action

The no action GRA involves performing no activities to remediate a site. The OU-2 groundwater treatment system would not operate under this GRA. For OU-2, the existing wellhead treatment systems at select purveyor wells would continue to operate under the no action GRA.

6.3.1.1 Effectiveness

The no action GRA would not actively remediate OU-2 and is thus an ineffective GRA because it would not meet RAOs or SCGs within a reasonable timeframe.

6.3.1.2 Implementability

The no action GRA would not require additional remediation activities; therefore, it is implementable.

6.3.1.3 Relative Cost

The no action GRA would not require any additional construction or implementation of additional equipment or remediation activities, but may require some decommissioning of existing treatment systems; therefore, the capital and O&M relative costs would be low. The overall relative cost would be low for the no action GRA.

6.3.1.4 Screening Results

Although the no action GRA would be ineffective and would not achieve RAOs or SCGs in a reasonable timeframe, it is retained for detailed evaluation because it is required by DER-10 (NYSDEC 2010b).

6.3.2 Institutional Controls

The institutional controls GRAs would include institutional controls, engineering controls (e.g., wellhead treatment), and restrictions on land and/or groundwater use. For OU-2, three specific process options would be contained in the institutional controls RAA: 1) deed restrictions, 2) groundwater monitoring, and 3) wellhead treatment.

6.3.2.1 Effectiveness

6.3.2.1.1 Deed Restrictions

The deed restrictions GRA would be ineffective as a stand-alone technology; however, when combined with other GRAs, it would be effective in preventing improper use of and reducing public exposure to site-related, COC-impacted groundwater.

6.3.2.1.2 Groundwater Monitoring

The groundwater monitoring GRA would be ineffective as a stand-alone technology; however, when combined with other GRAs, it would be effective in monitoring the progress of the selected groundwater remedy once implemented.

6.3.2.1.3 Wellhead Treatment

Wellhead treatment is an effective treatment technology in preventing public exposure to site-related, COC-affected groundwater. It would attain RAOs for OU-2 groundwater. This technology would be used to protect water purveyors, as required.

6.3.2.2 Implementability

6.3.2.2.1 Deed Restrictions

Deed restrictions are implementable because they are administrative in nature.

6.3.2.2.2 Groundwater Monitoring

Groundwater monitoring is already being conducted and is therefore implementable.

6.3.2.2.3 Wellhead Treatment

Wellhead treatment is already being conducted and is therefore implementable. Additional wellhead treatment would require access and other agreements with water purveyors and private users (e.g., golf course irrigation wells) prior to implementation.

6.3.2.3 Relative Cost

6.3.2.3.1 Deed Restrictions

Deed restrictions generally require a nominal capital cost to initiate and very low O&M cost. Overall, the relative costs for the deed restrictions would be low.

6.3.2.3.2 Groundwater Monitoring

Groundwater monitoring requires moderate capital costs if the infrastructure does not exist (e.g., the monitoring wells have not been installed), and the O&M cost is relatively low. Overall, the groundwater monitoring GRA would have a low relative cost partly because the monitoring infrastructure is already installed.

6.3.2.3.3 Wellhead Treatment

Moderate capital costs would be required to install the wellhead treatment system, with moderate O&M costs to run the system. Overall, the wellhead treatment RAA would have a high relative cost.

6.3.2.4 Screening Results

6.3.2.4.1 Deed Restrictions

Although deed restrictions are ineffective when used as a stand-alone remediation technology, they are effective when used in combination with other technologies; therefore, they are retained for detailed evaluation.

6.3.2.4.2 Groundwater Monitoring

Although groundwater monitoring is an ineffective remediation technology when used as a stand-alone technology, it is effective at monitoring the progress of remediation; therefore, it is retained for detailed evaluation.

6.3.2.4.3 Wellhead Treatment

Wellhead treatment is effective at protecting the human health and the environment from exposure to site-related, COC-affected groundwater. Wellhead treatment is retained for detailed evaluation.

6.3.3 Containment

The containment GRA that was retained from the initial screening (from Table 5-1) is groundwater extraction. Containment technologies are used to prevent further expansion of a groundwater plume and can be active (such as groundwater extraction through extraction trenches or wells) or passive (such as barriers or slurry walls). For OU-2, the process option retained from the initial screening is groundwater extraction from extraction well(s).

6.3.3.1 Effectiveness

The containment GRA via extraction well(s) is an effective technology that can achieve the first RAO—continue to protect public health by further mitigating exposure to site-related COCs in groundwater at concentrations in excess of SCGs—but may not actively reduce site-related COC concentrations in groundwater. Containment would need to be coupled with treatment and discharge/re-use GRAs to be applied to OU-2 groundwater.

6.3.3.2 Implementability

Containment via groundwater extraction is implementable in OU-2; however, it would require obtaining access agreements from public and private property owners to install additional extraction wells and associated infrastructure.

6.3.3.3 Relative Cost

Containment via groundwater extraction requires the installation of the extraction well(s) and associated infrastructure, which would have moderate capital costs. The O&M cost associated with containment would be high. Overall, containment via groundwater extraction well(s) would have a high relative cost.

6.3.3.4 Screening Results

Based on the effectiveness, implementability, and relative cost, containment via groundwater extraction well(s) is retained for detailed evaluation.

6.3.4 Removal

The removal GRA that was retained from the initial screening (from Table 5-1) is groundwater extraction. Removal technologies are used to extract contaminated media. The removed medium is generally disposed of with or without treatment. Extracted groundwater from OU-2 would require treatment prior to discharge/re-use. For OU-2, the process option retained from the initial screening is groundwater extraction from extraction well(s).

6.3.4.1 Effectiveness

The removal GRA via extraction well(s) is an effective technology that can achieve the second RAO—attain SCGs for site-related COCs in groundwater to the extent practicable—but may not, necessarily, prevent impacts to existing wells. Removal would need to be coupled with treatment and discharge/re-use GRAs to be applied to OU-2 groundwater.

6.3.4.2 Implementability

Removal via groundwater extraction well(s) is implementable in OU-2; however, it would require obtaining public and private access agreements to install the additional extraction wells.

6.3.4.3 Relative Cost

Removal via groundwater extraction requires the installation of extraction well(s) and associated infrastructure, which would have high capital costs. The O&M cost associated with the removal GRA would be high. Overall, removal via groundwater extraction well(s) would have a high relative cost.

6.3.4.4 Screening Results

Based on the effectiveness and implementability, removal via groundwater extraction is retained for detailed evaluation.

6.3.5 Discharge/Re-Use

The discharge/re-use GRAs that were retained from the initial screening (from Table 5-1) are subsurface injection and use of the extracted and treated groundwater by a water purveyor or a golf course. Discharge/re-use technologies would be used to manage treated water from which the site-related COCs have been removed. Extracted groundwater from OU-2 would require treatment prior to subsurface injection or use by a water purveyor or a golf course.

6.3.5.1 Effectiveness

The discharge/re-use GRAs via subsurface injection or use by a water purveyor or a golf course are effective technologies that can achieve RAOs and reduce long-term risks. The two retained discharge/re-use GRAs would be coupled with removal, containment, and/or treatment GRAs prior to being applied to OU-2 groundwater.

6.3.5.2 Implementability

Discharge/re-use via subsurface injection or use by a water purveyor or a golf course is implementable in OU-2; however, it would require obtaining access agreements from public and private property owners to install diffusion wells and the associated infrastructure.

6.3.5.3 Relative Cost

Discharge/re-use via subsurface injection or use by a water purveyor or a golf course would require the installation of diffusion well(s), which would have a high capital cost. The O&M costs

associated with these GRAs would be high. Overall, discharge/re-use via subsurface injection or use by purveyors would have a high relative cost.

6.3.5.4 Screening Results

Based on effectiveness and implementability, discharge/re-use GRAs via subsurface injection or use by a water purveyor or a golf course are retained for detailed evaluation.

6.3.6 *Ex-Situ* Treatment

The *ex-situ* treatment GRAs are technologies applied to a contaminated medium that has been removed. Typically, the contaminated medium is treated prior to discharge/re-use. Treatment technologies are physical, physical/chemical, chemical, and biological processes that are appropriate for site-related COCs. The four *ex-situ* treatment GRA process options retained from the initial screening are: 1) volatilization (i.e., air stripping), 2) liquid-phase adsorption, 3) vapor-phase adsorption, and 4) advanced oxidation. Volatilization will be referred to as air stripping in the remainder of this FS Report.

6.3.6.1 Effectiveness

6.3.6.1.1 Air Stripping

Air stripping is an effective treatment technology for the removal of site-related COCs from groundwater, but is ineffective at achieving RAOs and reducing long-term risks as a standalone technology. However, air stripping can be effective at achieving RAOs when combined with removal and discharge/re-use GRAs. Air stripping may require off-gas treatment to comply with air emission requirements.

6.3.6.1.2 Liquid-Phase Adsorption

Liquid-phase adsorption is an effective treatment technology for the removal of site-related COCs from groundwater, but is ineffective at achieving RAOs and reducing long-term risks as a standalone technology. However, liquid-phase adsorption can be effective at achieving RAOs when combined with removal and discharge/re-use GRAs. Some site-related COCs have limited adsorption capacity on LPGAC.

6.3.6.1.4 Vapor-Phase Adsorption

Vapor-phase adsorption is an effective treatment technology for the treatment of site-related COCs that have been removed from groundwater via air stripping (i.e., it is an off-gas treatment technology that can treat air stripper off-gas, if required), but is ineffective at achieving RAOs and reducing long-term risks as a standalone technology. However, vapor-phase adsorption can be effective at achieving RAOs when combined with removal, treatment (i.e., air stripping), and discharge/re-use GRAs. Some site-related COCs have limited adsorption capacity on vapor-phase GAC (VPGAC).

6.3.6.1.5 Advanced Oxidation

Advanced oxidation processes are effective treatment technologies for the removal of site-related COCs from groundwater, but are ineffective at achieving RAOs and reducing long-term risks as standalone technologies. However, advanced oxidation can be effective at achieving RAOs when combined with removal and discharge/re-use GRAs. Post-treatment with LPGAC may be required as a polishing step to remove partially oxidized compounds.

6.3.6.2 Implementability

6.3.6.2.1 Air Stripping

Air stripping is implementable. Access agreements would need to be obtained from public and private property owners to install and operate the treatment equipment.

6.3.6.2.2 Liquid-Phase Adsorption

Liquid-phase adsorption is implementable. Access agreements would need to be obtained from public and private property owners to install and operate the treatment equipment.

6.3.6.2.3 Vapor-Phase Adsorption

Vapor-phase adsorption is implementable. Access agreements would need to be obtained from public and private property owners to install and operate the treatment equipment.

6.3.6.2.4 Advanced Oxidation

Advanced oxidation is implementable. Access agreements would need to be obtained from public and private property owners to install and operate the treatment equipment.

6.3.6.3 Relative Cost

6.3.6.3.1 Air Stripping

Air stripping is the most cost-effective treatment technology for the site-related COCs.

6.3.6.3.2 Liquid-Phase Adsorption

Liquid-phase adsorption would have low capital and high O&M relative costs due to the presence of Freon 113.

6.3.6.3.3 Vapor-Phase Adsorption

Vapor-phase adsorption would have low capital and high O&M relative costs due to the presence of Freon 113.

6.3.6.3.4 Advanced Oxidation

Advanced oxidation would have very high capital and O&M relative costs because of the concentrations of the site-related COCs.

6.3.6.4 Screening Results

6.3.6.4.1 Air Stripping

Air stripping is an effective, implementable, and low relative cost treatment technology. Consequently, air stripping is retained for detailed evaluation.

6.3.6.4.2 Liquid-Phase Adsorption

Liquid-phase adsorption is an effective treatment technology for the majority of site-related COCs. However, Freon 113 may be present in OU-2 groundwater and liquid-phase adsorption is not as

effective as air stripping for treating this compound. Because of this limitation, liquid-phase adsorption is not retained for detailed evaluation.

6.3.6.4.3 Vapor-Phase Adsorption

Vapor-phase adsorption is an effective treatment technology for the majority of site-related COCs when combined with air stripping. However, Freon 113 may be present in OU-2 groundwater (and in air stripper off-gas from treated groundwater), and although this compound is highly amenable to air stripping, it is not effectively removed by vapor-phase adsorption. In spite of this limitation, vapor-phase adsorption is otherwise effective at treating air stripper off-gas and is retained for detailed evaluation.

6.3.6.4.4 Advanced Oxidation

Advanced oxidation processes are effective treatment technologies for site-related COCs. However, they would have high relative costs compared to other treatment technologies and are therefore not retained for detailed evaluation.

6.3.7 *In-Situ* Treatment

In-situ treatment involves the reduction of site-related COC concentrations in groundwater without pumping it to the surface for treatment. *In-situ* treatment technologies can be chemical, physical, thermal, or biological technologies that treat groundwater in place.

In-situ treatment technologies intercept, immobilize, or degrade compounds in the subsurface to shorten the time required for remediation. Passive technologies, such as PRBs, require little maintenance. Active *in-situ* technologies enhance the removal rate of site-related COCs, which may not be possible via P&T technology.

6.3.7.1 *In-Situ* Treatment Process Option Descriptions

Seven *in-situ* treatment process options are screened in this section: 1) in-well stripping, 2) ISCO, 3) PRBs with ZVI, 4) ERD, 5) air sparging with SVE, 6) phytoremediation, and 7) MNA.

6.3.7.1.1 In-Well Stripping

In-well air stripping is a technology that injects air into a vertical well that has been screened at two depths. The lower screen is set in the saturated groundwater zone and the upper screen is set in the unsaturated zone (vadose zone). Compressed air is injected into the well below the water table to aerate the water. The aerated water rises in the well and flows out of the system at the upper screen. Groundwater is drawn into the system at the lower screen. The VOCs volatilize within the well at the top of the water table as the air bubbles out of the water. The vapors are drawn out by an SVE system. The partially treated groundwater is not brought to the surface; it is forced into the unsaturated zone and the process is repeated as water follows a hydraulic circulation pattern, or cell, that allows continuous cycling of groundwater. As groundwater circulates through the treatment system *in situ*, COC concentrations are gradually reduced.

6.3.7.1.2 In-Situ *Chemical Oxidation*

In-situ chemical oxidation is an aggressive technology that involves the injection of chemical oxidants that destroy organic compounds in groundwater. Complete oxidation of compounds results in their breakdown into nontoxic compounds such as carbon dioxide, water, and chloride anions. This technology can significantly increase the mass transfer between the residual contaminated soil and groundwater, subsequently destroying the COC mass in a shorter period. Several factors affect the performance of this technology, including oxidant delivery to the subsurface, oxidant type, dose of oxidant, COC type and concentration, and non-COC oxidant demand.

The commonly used oxidants include ozone, Fenton's reagent, potassium permanganate, activated sodium persulfate, and catalyzed percarbonate. Permanganate can effectively oxidize site-related COCs and generate manganese dioxide precipitation in the subsurface. Permanganate is relatively stable in the subsurface, which makes it easier to deliver compared to other oxidants. Fenton's reagent, activated persulfate, and catalyzed percarbonate generate oxygen free radicals to oxidize COCs. Free radicals can oxidize a wide variety of compounds, but they are nonselective and have extremely short lifetimes. Therefore, effectively delivering the oxidants into the affected zones and ensuring that the free radicals come into contact with COCs can be difficult.

6.3.7.1.3 Permeable Reactive Barriers with Zero-Valent Iron

Permeable reactive barriers provide *in-situ* treatment of groundwater and are designed to intercept affected groundwater flow. These reactive barriers differ from impermeable barriers (e.g., slurry walls) or sheet pilings, which restrict the movement of a groundwater plume. Generally, PRBs can be installed as permanent, semi-permanent, or replaceable units that transect the plume flow path and act as a treatment wall. Natural hydraulic gradients transport COCs through the strategically placed reactive media, such as solid ZVI filings, which provide sufficient chemical reduction capacity to abiotically reduce site-related COCs.

6.3.7.1.4 Enhanced Reductive Dechlorination

Enhanced reductive dechlorination is a remedial technology designed to facilitate the *in-situ* anaerobic biological destruction of chlorinated VOCs in groundwater. This technology involves the injection of an electron donor (e.g., molasses, lactate), nutrients, and potentially dechlorinating microorganisms (i.e., bioaugmentation) into the subsurface. This combined delivery stimulates the natural reactions of microorganisms to degrade chlorinated VOCs.

6.3.7.1.5 Air Sparging with Soil Vapor Extraction

Air sparging with SVE is an *in-situ* treatment technology that involves subsurface air injection into the saturated zone, resulting in a phase transfer of VOCs from the dissolved to the vapor phase. Vapors are recovered by SVE, which creates a negative pressure in the unsaturated zone through a series of extraction wells to capture vapors and control the vapor plume migration. *Ex-situ* treatment of the extracted vapors is generally required as part of this process option.

6.3.7.1.6 Phytoremediation

Phytoremediation includes processes that use plant roots and their associated rhizospheric microorganisms to remove or degrade COCs in groundwater. The COCs are removed from groundwater through capture of groundwater for plant use; uptake and accumulation of COCs; uptake and processing of COCs through metabolization, mineralization, and transpiration; and rhizospheric degradation via microorganisms.

6.3.7.1.7 Monitored Natural Attenuation

Monitored natural attenuation is a technology that remediates groundwater through natural processes (e.g., biodegradation, dispersion, and adsorption) without active intervention. Generally, groundwater monitoring is used to track the progress of remediation. The technology is usually applied after other active technologies have reduced dissolved-phase concentrations to levels that are conducive to natural biodegradation.

6.3.7.2 Effectiveness

6.3.7.2.1 In-Well Stripping

In-well stripping would be an effective treatment technology for site-related COCs within a limited radius of treatment. Within this limited radius, RAOs could be met for OU-2 groundwater, but multiple well clusters would be required to effectively implement this technology. The technology becomes less effective on large, deep, stratified plumes, such as OU-2. Additionally, in-well stripping would require SVE to recover volatilized COCs. Because of the limited effective radius of treatment, in-well stripping would be ineffective on large plumes such as OU-2.

6.3.7.2.2 In-Situ *Chemical Oxidation*

Delivery of oxidants to appropriate locations is the key element for this approach's success. *In-situ* chemical oxidation depends upon achieving adequate contact between the injected oxidants and site-related COCs in groundwater. Because chemical reactions occur rapidly, the diffusion and mass transfer rate of site-related COCs away from the locations of injection would be expected to limit effectiveness at OU-2 (i.e., many injection locations would be required). Poor application can result in large pockets of untreated site-related COCs. Natural organics and reduced metals also consume oxidants. To treat site-related COCs effectively, sufficient oxidants would need to be applied. As a result, this technology is generally effective for a plume source area, but not for a large diluted plume such as OU-2.

6.3.7.2.3 Permeable Reactive Barriers with Zero-Valent Iron

Permeable reactive barriers have been effective in degrading chlorinated VOCs. However, at OU-2, placing a PRB downgradient of the plume to prevent site-related COC migration would require the PRB to be installed deep in the aquifer and transect the length of the plume, and the PRB would need to be effective for a very long time. The heterogeneity of subsurface features, such as presence of low-permeability layers within a coarser matrix, would prolong the operation required for PRBs due to the slow mass transfer of site-related COCs out of the low-permeable lenses. Periodic reactivation of the PRB would be necessary to retain its effectiveness. This technology would be ineffective as an OU-2 remedy.

6.3.7.2.4 Enhanced Reductive Dechlorination

For most sites, biological dechlorination reactions are limited by: 1) availability of biodegradable organic carbon (i.e., electron donor) that serves as an energy source for indigenous microorganisms, and/or 2) elevated concentrations of competing electron acceptors (such as ferrous iron, sulfate, and nitrate) that maintain elevated groundwater reducing conditions, competitively inhibiting the activity of the dechlorinating microbes.

Another issue limiting effectiveness for OU-2 would be the difficulty in distributing enough reagent/electron donor to create a sufficiently anaerobic environment for biological degradation of site-related COCs to occur. This technology is generally ineffective on Freon 113, a site-related COC.

6.3.7.2.5 Air Sparging with Soil Vapor Extraction

Air sparging with SVE may be effective at stripping site-related VOCs from the affected groundwater if an adequate number of vertically nested or horizontal sparge wells are installed at OU-2 to cover the large plume area. This technology generally reduces remediation times compared to *ex-situ* P&T technologies. Other than air, secondary chemical reagents are not applied to site groundwater, which limits secondary water quality effects. However, soil heterogeneity can create preferential pathways that can cause some zones to be relatively

unaffected and limit the ability to recover vapors. Another factor limiting effectiveness of this technology is low soil permeability.

6.3.7.2.6 Phytoremediation

Phytoremediation is applicable for relatively shallow groundwater (less than 10 feet bls) and large groundwater plumes with low levels of contamination (high levels of contaminants may be toxic to the plants). The time to achieve remediation may extend over several growing seasons and is highly dependent on climatic conditions at the site. Groundwater in OU-2 is generally deeper than 100 feet bls. Therefore, phytoremediation would not be an effective technology for OU-2.

6.3.7.2.7 Monitored Natural Attenuation

Monitored natural attenuation would be an effective treatment technology for OU-2 once the majority of the dissolved-phase mass has been removed. This technology can be applied after active remediation technologies have significantly reduced the concentration of COCs in groundwater and active remediation is no longer cost-effective.

6.3.7.3 Implementability

6.3.7.3.1 In-Well Stripping

In-well stripping is potentially implementable at OU-2. Numerous access agreements would need to be obtained because of the large number of stripping wells that would be required. Additionally, because this technology would require an SVE system to capture site-related COCs stripped from groundwater, additional equipment and infrastructure would be required.

6.3.7.3.2 In-Situ *Chemical Oxidation*

In-situ chemical oxidation is not implementable at OU-2 for plume treatment because of the depth and volume of aquifer that would need to be treated. In addition, the aquifer is used extensively as a source of drinking water for several local cities and the injection of oxidants may not be allowed by regulators. The technology is more applicable to treat localized source areas.

6.3.7.3.3 Permeable Reactive Barriers with Zero-Valent Iron

Permeable reactive barriers with ZVI would not be implementable at OU-2. These reactive barriers are installed downgradient, perpendicularly intersecting the contaminated groundwater flow. They can be installed via trenching if the targeted portion of the aquifer is shallow and surface structures do not interfere with access. They can also be installed by well injection at a greater depth and a high cost. In addition, the depth to which PRBs would need to be constructed is prohibitive, numerous access agreements would be required from private and public property owners where such a barrier would be installed, and regulators may not allow installation of PRBs in a drinking water aquifer.

6.3.7.3.4 Enhanced Reductive Dechlorination

Enhanced reductive dechlorination would not be implementable at OU-2. The depth and volume of site-related, COC-affected groundwater at OU-2 would require numerous wells and a large volume of amendment to enhance biodegradation. In addition, as with ISCO, implementation of this technology may be prevented because of the need to inject materials (i.e., the electron donor reagents; materials such as lactate, molasses, and acetate; and nutrients) into this drinking water aquifer and because the creation of anaerobic conditions throughout the aquifer may impair the existing beneficial uses.

6.3.7.3.5 Air Sparging with Soil Vapor Extraction

Air sparging with SVE would be potentially implementable at OU-2. Numerous access agreements would need to be obtained because of the large number of sparge wells that are required. Additionally, because this technology would require an SVE system to capture site-related COCs stripped from groundwater, additional equipment, infrastructure, and access agreements would be required to install the remedial system.

6.3.7.3.6 Phytoremediation

Phytoremediation would not be implementable at OU-2, although it has been used to treat groundwater affected by similar COCs. Preliminary results from existing projects indicate that site-related, COC-affected groundwater may be contained through depression in the water table

beneath the trees and the COC degradation in the tissues of the trees. However, the toxicity and bioavailability of degradation products is not always known. More research is needed to define the fate of various compounds in the plant metabolic cycle to determine whether contaminants and associated degradation products can still pose a risk to human health and the environment.

The OU-2 plume is located under an urban and suburban area. Implementation of phytoremediation would entail planting numerous trees of the appropriate species throughout OU-2. The likelihood of obtaining permission to convert the land use to "agriculture" for the purposes of phytoremediation is low.

6.3.7.3.7 Monitored Natural Attenuation

Monitored natural attenuation would be implementable at OU-2 because the groundwater monitoring infrastructure is already installed. Generally, MNA would be implemented after active remediation has reduced site-related COC concentrations.

6.3.7.4 Relative Cost

6.3.7.4.1 In-Well Stripping

In-well stripping would have high capital and O&M relative costs because of the numerous stripping wells that would need to be installed and the requirement to operate an SVE system to capture the stripped COC vapors.

6.3.7.4.2 In-Situ *Chemical Oxidation*

In-situ chemical oxidation would have high capital and moderate O&M relative costs. This technology has been successful in treating groundwater source areas, but treating large diluted plumes such as OU-2 is not cost-effective.

6.3.7.4.3 Permeable Reactive Barriers with Zero-Valent Iron

Reactive barriers with ZVI would have high capital and low O&M relative costs. The PRB reactivation may be as high as the initial capital cost. A PRB in the OU-2 aquifer would be cost-prohibitive.

6.3.7.4.4 Enhanced Reductive Dechlorination

Enhanced reductive dechlorination would involve high capital and O&M relative costs. At OU-2, the high costs may be driven by the need for numerous deep wells and for a high volume of electron donor.

6.3.7.4.5 Air Sparging with Soil Vapor Extraction

Air sparging with SVE would have moderate to high capital and O&M relative costs because of the numerous sparge wells that would need to be installed and the requirement to operate an SVE system to capture the stripped COC vapors.

6.3.7.4.6 Phytoremediation

Phytoremediation would have high capital and O&M relative costs.

6.3.7.4.7 Monitored Natural Attenuation

Monitored natural attenuation would have low capital and O&M relative costs.

6.3.7.5 Screening Results

6.3.7.5.1 In-Well Stripping

In-well stripping is an effective treatment technology for source area or small plume remediation, but is less effective for large, deep plumes such as OU-2 and is therefore not implementable. Thus, in-well stripping is not retained for detailed evaluation.

6.3.7.5.2 In-Situ *Chemical Oxidation*

In-situ chemical oxidation is another technology that is applied to small or source area plumes, but not for large, deep plumes such as OU-2; therefore, ISCO is not implementable. Due to the lack of implementability and the prohibitive cost, ISCO is not retained for detailed evaluation.

6.3.7.5.3 Permeable Reactive Barriers with Zero-Valent Iron

Permeable reactive barriers with ZVI are not implementable at OU-2 and are cost-prohibitive; thus, PRBs are not retained for detailed evaluation.

6.3.7.5.4 Enhanced Reductive Dechlorination

Because of the numerous injection wells and the high volume of electron donor that would be required to implement ERD, this technology is not implementable and is therefore not retained for detailed evaluation.

6.3.7.5.5 Air Sparging with Soil Vapor Extraction

Air sparing with SVE is an effective treatment technology for source area or small plume remediation, but it is less effective for large, deep plumes such as OU-2 and is therefore not implementable. Thus, air sparging is not retained for detailed evaluation.

6.3.7.5.6 Phytoremediation

Phytoremediation is only effective in shallow groundwater plumes that are within the root zone (approximately 10 feet bls). Because OU-2 is a deep plume, this technology is not implementable and is therefore not retained for detailed evaluation.

6.3.7.5.7 Monitored Natural Attenuation

This technology may be applied once the dissolved-phase concentrations of the plume have been reduced to appropriate levels, but it would not achieve RAOs within the 30-year period. Therefore, MNA was not retained for detailed evaluation.

6.4 SUMMARY OF REMEDIAL TECHNOLOGY SCREENING

The following technologies and process options (as summarized in Table 6-1) are retained from the initial screening:

- No Action
- Institutional Controls:

- Deed Restrictions
- Groundwater Monitoring
- Wellhead Treatment

- Containment—Groundwater Extraction—P&T
- Removal—Groundwater Extraction—P&T
- Discharge/Re-Use—Injection/SPDES Discharge or Equivalent or Use by a Water Purveyor or a Golf Course
- *Ex-Situ* Treatment:
  - Volatilization—Air Stripping
  - Adsorption—VPGAC.

Section 7
Development and Analysis of Remedial Action Alternatives

This section describes the RAAs that have been developed to address OU-2 groundwater.

7.1 RATIONALE FOR DEVELOPMENT OF ALTERNATIVES

Remedial action alternatives have been developed for evaluation based on the potential for these alternatives to meet the SCGs, RAOs, and PRGs described in Section 4. In Section 5, possible GRAs and associated process technologies were identified and screened to determine the optimum remedial technologies and process options that are most suitable for remediating OU-2 groundwater. In Section 6, the optimum GRAs and associated process options were further screened based on effectiveness, implementability, and relative cost. Based on the results of this final screening, process options were retained for inclusion as RAAs (Table 6-1). This section presents the final selected process options to formulate groundwater RAAs designed to comply with the RAOs and SCGs for OU-2 as well as NYSDEC requirements.

7.2 DESCRIPTION OF REMEDIAL ACTION ALTERNATIVES

All alternatives include operation of the OU-1 treatment system. Also, while not considered part of the groundwater remedy, baseline conditions include continued operation of (and potential future addition to) local water purveyors' groundwater supply well systems and golf course irrigation water supply systems, which may or may not include ancillary wellhead treatment. The following RAAs have been assembled from the technologies and process options that have passed screening:

- **RAA-1 – No Action** (Baseline scenario that does not include the current OU-2 IRM, but does include OU-1 system operation, purveyor well treatment as necessary, and as-needed treatment of the VLSGC irrigation well [institutional controls])

- **RAA-2 – Conversion of the OU-2 IRM System to the Final Remedy as the Primary Action**:

  - **2a** – No additional infrastructure.

  - **2b** – Installation of a new 120-gpm on-site (OU-1) remedial well and upgrade of the OU-1 treatment system to accommodate the additional treatment volume.

  - **2c** – Installation of one new 120-gpm remedial well. To mitigate risks to MLWD well N5099, a new 1,200-gpm treatment system for this well would be constructed just north of the well on MLWD property. Manhasset-Lakeville Water District would continue to use the well at a higher flow rate than the current average.

- **RAA-3 – Capture Additional COC Mass**:

  - **3a** – Installation of one 120-gpm on-site remedial well and one new 500-gpm remedial well near the northeast corner of VLSGC, upgrading the OU-2 IRM treatment system to accommodate the increased flow rate, and installation of two new diffusion wells. The new VLSGC remedial well would be connected to the OU-2 IRM treatment system via piping installed along Lakeville Road.

  - **3b** – Installation of one new 120-gpm on-site remedial well and one new 500-gpm remedial well, a new groundwater treatment system near the northeast corner of VLSGC, and two new diffusion wells near the northwest portion of the same golf course. The new diffusion wells would be connected to the proposed treatment system at VLSGC via piping installed along the northern and western golf course boundaries.

- **RAA-4 – Targeted Hydraulic Control:**

  – **4a** – Installation of three new remedial wells (a 120-gpm on-site well, and 500- and a 700-gpm wells within the MLWD facility located on Community Drive), four new diffusion wells in the west side of FMCC, and a new groundwater treatment system near the new extraction wells. The new diffusion wells would be connected

to the proposed treatment system at MLWD via piping installed along Community Drive, the southern perimeter of FMCC, and Lakeville Road.

- **4b** – Installation of three new remedial wells (one 120-gpm on-site well and two 500-gpm wells near the central east side of Community Drive [adjacent to NSLIJH]), four new diffusion wells south of NSLIJH, and a new groundwater treatment system near the new diffusion wells. All piping, required to connect the new off-site remedial and diffusion wells to the proposed NSLIJH treatment system, would be located within the hospital's parking lot.

- **4c** – Installation of one new 120-gpm on-site remedial well and two new 800-gpm remedial wells (one near the northeast corner of VLSGC and one on a vacant MLWD parcel near the southeast corner of FMCC), four new diffusion wells (south of NSLIJH and within the MLWD facility located on Community Drive), and a new groundwater treatment system located within the MLWD facility located on Community Drive. Piping, required to connect the new off-site remedial and diffusion wells to the proposed MLWD treatment system, would be routed along Community Drive, North Service Road, Horace Harding Boulevard, and Lakeville Road.

- **4d** – Installation of five new remedial wells (one 120-gpm on-site well, one 1,200-gpm well near the northeast corner of Village of Lake Success Park [VLSP], one 1,000-gpm well at the Korean Church property south of FMCC, and two wells within the MLWD facility located on Community Drive—one 350-gpm well and one 450-gpm well), eight new diffusion wells (four north and four south of NSLIJH), and a new groundwater treatment system within the MLWD facility located on Community Drive. Piping runs along Community Drive and Horace Harding Boulevard would be required to connect the new off-site remedial and diffusion wells to the proposed Korean Church treatment system.

- **4e** – Installation of four new remedial wells (one 120-gpm on-site well, one 500-gpm well near the northeast corner of VLSGC, and two wells on the central east side

of Community Drive (NSLIJH)—one 450-gpm well and one 550-gpm well), six new diffusion wells (two near the northwest portion of the VLSGC and four south of NSLIJH), and two new groundwater treatment systems near the northeast corner of the VLSGC and at NSLIJH near the new extraction wells. The new VLSGC diffusion wells and treatment system would be connected via piping installed along the northern and western boundaries of the golf course, while piping along Community Drive would be installed to connect the new diffusion wells and treatment system proposed at NSLIJH.

- **4f** – Installation of two new remedial wells (one 120-gpm on-site well and one 1,600-gpm well at the Korean Church property south of FMCC), four new diffusion wells (two north and two south of NSLIJH), and a new groundwater treatment system at the Korean Church property. Pipe runs along Community Drive, North Service Road, and Horace Harding Boulevard would be needed to connect the new diffusion wells to the proposed Korean Church treatment system.

- **4g –** Installation of one new 120-gpm on-site remedial well, conversion of MLWD well N5099 to a remedial well, four new diffusion wells (two located within the Macy's parking lot and two located at NSLIJH), and one new 1,200-gpm treatment system north of FMCC near MLWD well N5099 to treat water from well N5099. Since MLWD well N5099 would be converted to a remedial well, a new supply well and treatment system would be provided to MLWD to replace well N5099 at another location within the MLWD service area. Piping runs along Community Drive East and Community Drive would be required to connect the new diffusion wells to the proposed MLWD treatment system.

- **4h –** Installation of one new 120-gpm remedial well, conversion of MLWD well N5099 to a remediation well, four new diffusion wells (two located within the Macy's parking lot and two located at NSLIJH), and one new 1,200-gpm treatment system north of FMCC near MLWD well N5099 to treat water from well N5099, and installation of one new 500-gpm remedial well near the northeast corner of VLSGC, two new diffusion wells located near the northwest corner of VLSGC, and

one treatment plant near the extraction well on the same golf course. Since MLWD well N5099 would be converted to a remedial well, a new supply well and treatment system would be provided to MLWD to replace well N5099 at another location within the MLWD service area. Piping runs along Community Drive East and Community Drive would be required to connect the new diffusion wells to the proposed MLWD treatment system. The new VLSGC diffusion wells and treatment system would be connected via piping installed along the northern and western boundaries of the golf course.

- **RAA-5 – Hydraulic Containment**:

  - **5a** – Installation of five new remedial wells (a 120-gpm on-site well, a 500-gpm well near the northeast corner of VLSGC, two wells located within the MLWD facility located on Community Drive—a 600-gpm well and a 900-gpm well, and one 1,200-gpm well located near the northeast corner of VLSP), nine new diffusion wells (three south of NSLIJH and six within the central west portion of FMCC), and two new groundwater treatment systems near the central east side of FMCC and near the northeast corner of VLSGC. Piping, required to connect the new off-site remedial and diffusion wells to the proposed MLWD and VLSGC treatment systems, would be routed along Community Drive, Horace Harding Boulevard, and Lakeville Road.

  - **5b** – Installation of one new 120-gpm on-site remedial well, installation of two new 650-gpm wells (in a residential area north of LIE) and two new 1,000-gpm wells (at FMCC and NSLIJH), nine new diffusion wells (four northwest and two north of FMCC, and three diffusion wells south of NSLIJH), and two new groundwater treatment systems near the northeast corner of VLSGC and at NSLIJH. Piping runs along Community Drive, Northern Boulevard, Lakeville Road, Horace Harding Boulevard, and numerous residential streets would be required to connect the new remedial and diffusion wells to the new treatment systems proposed at VLSGC and NSLIJH.

7.2.1 Institutional Controls

All RAAs contain institutional controls designed to reduce exposure and risks to public health. Institutional controls include deed restrictions (groundwater use restrictions), outpost monitoring (including the installation of four new groundwater monitoring well clusters), and wellhead treatment. All RAAs include operation of the OU-1 treatment system, affected purveyor wellhead treatment systems, and the VLSGC temporary irrigation water treatment system. As discussed in Section 3.10, this system will only be operated as needed during periods of extended drought, which generally occur every 3 to 5 years. The system will extract groundwater from irrigation well N8038 at a flow rate of 300 gpm, with the treated water discharged into Lake Surprise.

7.2.1.1 Deed Restrictions

Deed restrictions will be instituted to control the use of groundwater. The use restrictions may also include a requirement for engineering controls, which may include ancillary wellhead treatment in impacted areas or areas anticipated to be impacted. Assuming that the institutional controls comply with groundwater use restrictions, this technology is effective in controlling risks to the public. Wellhead treatment is an important element in the overall protection of the public water supply and its users. Groundwater use restrictions are implementable and should fit in with the overall future development of OU-2.

7.2.1.2 Outpost Groundwater Monitoring

The outpost groundwater monitoring component of institutional controls includes the installation of four new groundwater monitoring well clusters north of LIE. These monitoring wells and the 30 existing wells will be used to monitor the remediation progress and the migration of the site-related, COC-affected groundwater plume. Groundwater monitoring will be conducted annually in accordance with the monitoring plan that will be developed for NYSDEC approval. Any approved groundwater monitoring plan will be periodically reviewed to ensure that the data being collected is relevant and value-added. Over time, periodic adjustments may be suggested in the groundwater monitoring program to reflect changing conditions and/or data efficiencies.

7.2.2 Hydraulic Containment and Removal by Groundwater Pumping with Treatment

The OU-2 treatment system extracts groundwater from well RW100. The extracted water is treated with an air stripper and the air stripper off-gas is treated with VPGAC and potassium permanganate-impregnated zeolite. Treated groundwater is then injected into diffusion wells DW100, DW101, and DW102 under a SPDES discharge permit. All RAAs include continued operation of the OU-1 and OU-2 treatment systems (with the exception of RAA-1 [no action] where the OU-2 treatment system is not operated). The remaining RAAs (except RAA-2a, which does not require additional infrastructure) involve additional P&T systems (i.e., extraction wells, groundwater treatment with an air stripper, air stripper off-gas treatment with VPGAC if required, and subsurface injection). These existing and new P&T systems will mitigate downgradient site-related COC migration and will reduce site-related COC concentrations.

7.3 DETAILED EVALUATION OF THE REMEDIAL ACTION ALTERNATIVES

The following sections evaluate the RAAs.

7.3.1 Evaluation Criteria for Detailed Screening of Technologies

Analogous to the nine NCP criteria, each of the RAAs are evaluated according to the following seven criteria, as required by DER-10 (NYSDEC 2010b):

1. Overall protectiveness of public health and the environment
2. Conformance with SCGs
3. Long-term effectiveness and permanence
4. Reduction of toxicity, mobility, or volume of contamination through treatment
5. Short-term impact and effectiveness
6. Implementability
7. Cost effectiveness

In addition to the above seven criteria, an eighth criterion, consistency with green remediation principles (compliance with NYSDEC DER-31 [NYSDEC 2010c])—has been added to the FS evaluation. A ninth criterion, community acceptance, is also evaluated by NYSDEC, but only after the public involvement process is complete. For this reason, community acceptance has not been evaluated in this report, but it will be evaluated after any public comments on the remedy have been received and prior to selection of the remedy.

The evaluation criteria are described (as stated in DER-10 [NYSDEC 2010b]) in Sections 7.3.1.1 through 7.3.1.7.

7.3.1.1 Overall Protectiveness of Public Health and the Environment

This criterion involves evaluating the remedy's ability to protect public health and the environment and assessing how risks posed through each existing or potential pathway of exposure are eliminated, reduced, or controlled through removal, treatment, engineering controls, or institutional controls. The remedy's ability to achieve each of the RAOs is evaluated.

7.3.1.2 Conformance with SCGs

Conformance with SCGs addresses whether a remedy will meet applicable environmental laws, regulations, standards, and guidance. SCGs for the site are listed along with a discussion of whether or not the remedy will achieve compliance. Chemical-, location-, and action-specific SCGs are summarized on Table 4-1.

7.3.1.3 Long-Term Effectiveness and Permanence

This criterion evaluates the long-term effectiveness of the remedy after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated:

- Magnitude of the remaining risks (i.e., evaluates if any significant threats, exposure pathways, or risks to the community and environment will be present from the remaining wastes or treated residuals)

- Adequacy of the engineering and institutional controls intended to limit the risk

- Reliability of these controls

- Ability of the remedy to continue to meet RAOs in the future

7.3.1.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

The remedy's ability to reduce the toxicity, mobility, or volume of contamination of site-related COCs is evaluated. Preference is given to remedies that permanently and significantly reduce the toxicity, mobility, or volume of the COCs at the site.

7.3.1.5 Short-Term Impact and Effectiveness

This criterion involves evaluating potential short-term adverse impacts and risks of the remedy upon the community, the workers, and the environment during the construction and/or implementation. In addition, the methods for controlling the identified adverse impacts and health risks to the community or workers at the site and the effectiveness of the engineering controls (i.e., dust control measures) are discussed. The length of time needed to achieve the remedial objectives is estimated.

7.3.1.6 Implementability

The technical and administrative feasibility of implementing the remedy is evaluated. Technical feasibility includes the difficulties associated with construction/site availability and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for monitoring and construction of extraction/diffusion wells and treatment system components, and other items.

For this FS, each RAA is given a technical implementability score from 1 to 4, with 1 being the easiest to construct, and an administrative implementability score from 1 to 10, with 1 corresponding to the highest likelihood of negotiating and obtaining access to construct the required infrastructure. The overall implementability score is the aggregate of the technical and administrative implementability scores (ranging from 2 to 14). Implementability scores of 6 or less are considered to be implementable based on ongoing access negotiations with critical site owners

where infrastructure is required. Appendix B presents additional information regarding negotiations with owners of property where the installation of RAA infrastructure has been proposed.

All RAAs include wellhead treatment for water purveyors and private users that may be affected by site-related COCs in the future. It is assumed that these water purveyors and private users will provide access to install treatment infrastructure, and therefore installation of these systems will not impact the implementability evaluation for the RAAs.

7.3.1.7 Cost Effectiveness

Capital, O&M, and monitoring costs are estimated for each RAA and presented on a present-worth basis (2010 dollars). Thirty-year net present value (NPV) costs are presented for each of the RAAs. The NPV costs are based on a 3.5 percent inflation rate and an 8 percent discount rate. Capital and O&M costs of wellhead treatment systems installed at affected water purveyors or private users are included. The cost model is included in Appendix C.

7.3.1.8 Consistency with Green Remediation Principles

Consistent with emerging green remediation guidance from USEPA (2008), NYSDEC's DER-31 Green Remediation Policy (NYSDEC 2010c), and Lockheed Martin's Go Green initiative, each developed RAA is evaluated against the commonly accepted green remediation metrics of energy consumption, air emissions, water use and impacts, materials consumption and waste generation, land use, stewardship, and health and safety. The NYSDEC's (2010c) DER-31 guidelines and the sustainability metrics used to evaluate the developed RAAs are summarized in Sections 7.3.1.8.1 and 7.3.1.8.2.

7.3.1.8.1 NYSDEC DER-31 Green Remediation Policy

The NYSDEC (2010c) DER-31 guidelines are intended to promote a holistic approach to remedial programs by considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprint of cleanup actions. This approach will minimize the overall environmental impacts associated with the cleanups by implementing sustainable practices and technologies that, for example, minimize energy consumption, promote

environmental stewardship, generate less waste, increase re-use and recycling of materials, emit fewer pollutants and greenhouse gases to the atmosphere, maximize the re-use of land, conserve natural resources, and minimize disruption to the environment. The NYSDEC (2010c) DER-31 guidelines call for the consideration of green remediation concepts and techniques during all stages of the remedial program, from site characterization through implementation of the remedy to long-term site management. The following major green remediation concepts should be used to the extent possible as part of a sustainable remedial program:

- Consider long-term environmental impacts associated with treatment technologies and remedy stewardship when choosing a site remedy
- Reduce direct and indirect greenhouse gases and other emissions
- Maximize energy efficiency and minimize use of nonrenewable energy
- Conserve and efficiently manage, to the extent possible, resources and materials
- Minimize waste generation and increase recycling and re-use of materials that would otherwise be considered a waste
- Maximize habitat value and create habitat when possible
- Foster green and healthy communities and working landscapes that balance ecological, economic, and social goals
- Integrate the remedy with the end use where possible and encourage green and sustainable redevelopment

The greatest benefit to the environment from implementation of the green remediation concepts can be achieved during the remedy selection phase; therefore, NYSDEC recommends incorporating these principles into the RAA analysis, evaluation, and selection process. NYSDEC requires that all RAA and decision documents, such as FS reports, describe the green remediation principles considered in the evaluation and/or selection of a remedy, present or reference any qualitative and/or quantitative sustainability information generated in support of remedy selection, and discuss how the impacts can be minimized during implementation. NYSDEC will also require that green remediation and sustainability efforts be implemented to the extent feasible in the design and implementation of the selected remedy.

7.3.1.8.2 Selected Environmental Metrics

In accordance with the green remediation principles (NYSDEC 2010c), each developed RAA is evaluated against the environmental metrics of energy consumption, air emissions, water use and impacts, materials consumption and waste generation, land use, stewardship, and health and safety. Each green remediation metric is described below:

- **Energy consumption** is evaluated considering the power requirements of machinery, fuel requirements, and electrical energy requirement for RAA implementation and operation based on engineering design assumptions and manufacturer specifications.
- **Air emissions** are evaluated by identifying emission sources of major RAA activities such as on-site equipment use and transportation of materials to and from the site.
- **Water consumption and impacts** are estimated for each RAA based upon on-site activities for each remedial scenario. Examples of water impacts include extraction of groundwater and discharge to various outfalls such as surface water or a storm drain, while examples of water consumption include the use of potable water to support components of the remedy, equipment cleaning and decontamination, and dust suppression.
- **Materials consumption and waste generation** are evaluated by estimating the amount of materials to be consumed and waste created for each RAA during construction and implementation. Examples of materials consumed include piping and well construction components and concrete for construction of structures and foundations. Examples of waste generated include soil cuttings generated during well drilling and installation and purged groundwater generated during well development activities.
- **Land use** is evaluated for the current, intended, and reasonably anticipated future use of the site and its surroundings, as it relates to each RAA, when unrestricted levels will not be achieved.
- **Stewardship** pertains to the effect of the RAA's impacts on the short- and long-term environmental impacts associated with the surrounding community, ecosystem, and local economy.

- **Health and safety** are evaluated based on both the associated inherent risks (risks associated with active remedies, site conditions, and geographic location) and also risks that are a direct result of the technical approaches within the alternatives.

7.3.2 Alternative 1—No Action and Institutional Controls

The no action scenario is considered to provide a baseline level to compare with the other remedial technologies and alternatives. Under this alternative, the OU-1 groundwater treatment system would continue to operate; otherwise, no further action (except institutional controls) would be performed. Operation of the OU-2 treatment system would discontinue. The analysis of RAA-1 is summarized in Tables 7-1 and 7-2. Figure 7-1 illustrates the associated infrastructure required for RAA-1.

7.3.2.1 Overall Protectiveness of Public Health and the Environment

RAA-1 would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater. RAA-1 would meet the protection of public health RAO.

7.3.2.2 Conformance with SCGs

This section describes how RAA-1 complies with SCGs.

7.3.2.2.1 Chemical-Specific SCGs

The no action RAA would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- Clean Water Act (CWA) Ambient Water Quality Criteria (40 Code of Federal Regulations [CFR] Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors are affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.2.2.2 Action-Specific SCGs

RAA-1 complies with action-specific SCGs (the existing and future wellhead treatment systems would operate).

7.3.2.2.3 Location-Specific SCGs

RAA-1 would comply with local building permits and with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCG.

7.3.2.3 Long-Term Effectiveness and Permanence

RAA-1 would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be future risk of affecting additional downgradient water purveyors.

7.3.2.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

The no action RAA would not significantly reduce the toxicity or mobility of site-related, COC-affected groundwater; however as shown in Table 7-5, RAA-1 would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 36,200 acre-feet by the continued operation of the OU-1 groundwater treatment system. Figure 7-1 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour; Appendix A provides the RAA-1 mass removal information.

7.3.2.5 Short-Term Impact and Effectiveness

RAA-1 would be effective in the short term because treatment systems are already installed at site-related, COC-affected purveyor wells; therefore, no adverse short-term effects are associated with

the no action RAA. The length of time required to achieve RAOs is indeterminate for RAA-1 (Table 7-3).

7.3.2.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells; therefore, RAA-1 was given a technical implementability score of 1. This RAA does not require the installation of additional treatment systems or associated infrastructure for remediation; therefore, no new access agreements or permits are required. However, existing access agreements and permits would need to be reevaluated and amended as necessary. New access agreements would be needed for the installation and sampling of new groundwater monitoring wells, resulting in an administrative implementability of 3 for this alternative. RAA-1 is the most implementable alternative, with an overall implementability score of 4 (Table 7-2).

7.3.2.7 Cost Effectiveness

The capital cost for RAA-1 would be approximately $5,100,000 and the 30-year NPV cost would be approximately $8,600,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.2.8 Consistency with Green Remediation Principles

RAA-1 would not involve any additional infrastructure at the site or remedial activities besides continued operation of the existing OU-1 treatment system; however, RAA-1 would not include the continued operation of the OU-2 IRM system and would therefore incur incrementally lower energy and water requirements, air emissions, impacts to land, material consumption, waste generation, health and safety concerns, and environmental impacts to the surrounding community associated with routine groundwater monitoring, reporting, and management activities.

7.3.3 Alternative 2a—Conversion of the Operable Unit 2 Groundwater Treatment System to the Final Remedy

RAA-2a would include institutional controls and continued operation of the OU-2 groundwater treatment system. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, vapor-phase treatment, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a total flow rate of approximately

500 gpm. This RAA would continue to reduce downgradient migration of site-related, COC-affected groundwater. The analysis of RAA-2a is summarized in Tables 7-1 and 7-2; Figure 7-2 shows the locations of the RAA-2a remediation wells, diffusion wells, and the OU-2 groundwater treatment system.

7.3.3.1 Overall Protectiveness of Public Health and the Environment

RAA-2a would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater and would continue to do so under this RAA. RAA-2a would meet the protection of public health RAO.

7.3.3.2 Conformance with SCGs

This section describes how RAA-2a complies with SCGs.

7.3.3.2.1 Chemical-Specific SCGs

RAA-2a would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.3.2.2 Action-Specific SCGs

RAA-2a would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.3.2.3 Location-Specific SCGs

RAA-2a would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-2a would comply with location-specific SCGs.

7.3.3.3 Long-Term Effectiveness and Permanence

RAA-2a would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be future risk of affecting additional downgradient water purveyors.

7.3.3.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-2a would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-2a would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 31,900 acre-feet by the continued operation of the OU-1 and OU-2 groundwater treatment systems. Figure 7-2 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour; Appendix A provides the RAA-2a mass removal information.

7.3.3.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and is operational. Four new groundwater monitoring well clusters in RAA-2a would be installed, and outpost groundwater conditions would be monitored. Installation of the four monitoring well clusters, implementation of groundwater monitoring, and operation of the OU-2 groundwater treatment system would be expected to have some impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-2a would be minimized. The length of time

required to achieve RAOs in OU-2 groundwater would be approximately 17, 27, and more than 30 years for the golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.3.6 Implementability

RAA-2a is implementable. Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 treatment system is already constructed. Therefore, a technical implementability score of 1 was given to RAA-2a. This RAA would not require the installation of additional treatment systems or associated infrastructure for remediation; however, the installation of four new monitoring well clusters would require access agreements and permits. Accordingly, RAA-2a scored 3 for administrative implementability to bring the overall implementability score to 4, which is similar to RAA-1 (Table 7-2).

7.3.3.7 Cost Effectiveness

The capital cost for RAA-2a would be approximately $8,600,000 and the 30-year NPV cost would be approximately $32,000,000 (Table 7-4). The cost of installing wellhead treatment of MLWD well N5099 is included.

7.3.3.8 Consistency with Green Remediation Principles

RAA-2a would not involve any additional infrastructure at the site or remedial activities besides continued operation of the existing OU-1 and OU-2 treatment systems; therefore, RAA-2a would not incur incrementally greater energy and water requirements, air emissions, impacts to land, material consumption, waste generation, health and safety concerns, or environmental impacts to the surrounding community associated with routine groundwater monitoring, reporting, and management activities.

7.3.4 Alternative 2b—Conversion of the Operable Unit 2 Groundwater Treatment System to the Final Remedy with Additional Pumping from the Basal Magothy Aquifer at Operable Unit 1

RAA-2b would include institutional controls and continued operation of the OU-1 and OU-2 groundwater treatment systems. RAA-2b would also include the installation of one new remediation well (EW1D) in the basal portion of the Magothy aquifer to improve groundwater

capture with treatment provided by the existing OU-1 system. This system is currently operating at approximately 730 gpm and is designed to handle up to 900 gpm. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, vapor-phase treatment, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a sustained flow rate of approximately 500 gpm. The OU-2 groundwater treatment system would be upgraded to accommodate the increased treatment flow rate. This RAA would continue to remove mass and reduce downgradient migration of site-related, COC-affected groundwater. The analysis of RAA-2b is summarized in Tables 7-1 and 7-2, and Figure 7-3 shows the locations of the RAA-2b remediation wells, diffusion wells, and the OU-2 groundwater treatment system.

7.3.4.1 Overall Protectiveness of Public Health and the Environment

RAA-2b would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater and would continue to do so under this RAA. RAA-2b would meet the protection of public health RAO.

7.3.4.2 Conformance with SCGs

This section describes how RAA-2b complies with SCGs.

7.3.4.2.1 Chemical-Specific SCGs

RAA-2b would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)
- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.4.2.2 Action-Specific SCGs

RAA-2b would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.4.2.3 Location-Specific SCGs

RAA-2b would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-2b would comply with location-specific SCGs.

7.3.4.3 Long-Term Effectiveness and Permanence

RAA-2b would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be future risk of affecting additional downgradient water purveyors.

7.3.4.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-2b would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-2b would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 30,400 acre-feet by the continued operation of the OU-1 treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, and operation of the OU-2 groundwater treatment system. Figure 7-3 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-2b mass removal information.

7.3.4.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and is operational. Four new groundwater monitoring well clusters in RAA-2b would be installed, and outpost groundwater conditions would be monitored. Installation of the new extraction and diffusion wells would impact the public for a short period of time. Monitoring well installation, implementation of groundwater monitoring, and operation of the OU-2 groundwater treatment system would be expected to have some impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-2b would be minimized. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 18 years for golf course wells and more than 30 years for remedial and public supply wells (based on current pumping and modeling) (Table 7-3).

7.3.4.6 Implementability

RAA-2b is implementable. Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 treatment system is already constructed. A technical implementability score of 1 was given to RAA-2b. This RAA would not require the installation of additional treatment systems or associated infrastructure for remediation; however, the installation of the four new monitoring well clusters and the new extraction well would require access agreements and permits. Accordingly, RAA-2b scored 4 for administrative implementability to bring the overall implementability score to 5 (Table 7-2).

7.3.4.7 Cost Effectiveness

The capital cost for RAA-2b would be approximately $9,800,000 and the 30-year NPV cost would be approximately $38,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.4.8 Consistency with Green Remediation Principles

RAA-2b would involve the installation of one new remediation well and continued operation of the existing OU-1 and OU-2 treatment systems; therefore, RAA-2b involves minimal energy and water requirements, air emissions, impacts to land, material consumption, waste generation, health

and safety concerns, and environmental impacts to the surrounding community associated with routine groundwater monitoring, reporting, and management activities.

7.3.5 Alternative 2c—Conversion of the Operable Unit 2 Groundwater Treatment System to the Final Remedy with Additional Pumping from the Basal Magothy Aquifer at Operable Unit 1 and Manhasset-Lakeville Water District Well N5099

RAA-2c would involve institutional controls and the continued operation of the OU-2 groundwater treatment system. RAA-2c would also include the installation of one new 120-gpm remediation well (EW1D) in the basal portion of the Magothy aquifer at OU-1 to improve groundwater capture. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, vapor-phase treatment with GAC, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. The OU-1 groundwater treatment system includes extraction of groundwater from extraction wells EW1, EW1D, RW1RS, and RW1RD; treatment via air stripping and VPGAC; and subsurface injection into diffusion wells DW11, DW12, and DW13 at a flow rate of approximately 730 gpm.

The OU-1 groundwater treatment system would be upgraded to accommodate the additional flow from well EW1D. A new 1,200-gpm treatment system would be installed adjacent to MLWD well N5099 to provide risk mitigation via institutional controls, and treated groundwater would be discharged into the MLWD distribution system. Well N5099 would be pumped continuously at a flow rate of approximately 1,200 gpm; this flow rate would be maintained unless NYSDEC approved its reduction. This RAA would continue to reduce downgradient migration of site-related, COC-affected groundwater. The analysis of RAA-2c is summarized in Tables 7-1 and 7-2, and Figure 7-4 shows the locations of the RAA-2c remediation wells, diffusion wells, the new groundwater treatment system, and the OU-2 groundwater treatment system.

7.3.5.1 Overall Protectiveness of Public Health and the Environment

RAA-2c would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by site-related COCs, and institutional controls through wellhead treatment would be implemented at

wells that may become affected in the future. This alternative would include wellhead treatment at supply well N5099, which would provide protection to public health when the well becomes impacted by site-related COCs. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater and would continue to do so under this RAA. RAA-2c would meet the protection of public health RAO.

7.3.5.2 Conformance with SCGs

This section describes how RAA-2c complies with SCGs.

7.3.5.2.1 Chemical-Specific SCGs

RAA-2c would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.5.2.2 Action-Specific SCGs

RAA-2c would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.5.2.3 Location-Specific SCGs

RAA-2c would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-2c would comply with location-specific SCGs.

7.3.5.3 Long-Term Effectiveness and Permanence

RAA-2c would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs; however, wellhead treatment prior to discharge to the distribution system would protect public health. Nevertheless, there would be future risk of affecting other downgradient water purveyors if this RAA is implemented.

7.3.5.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-2c would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-2c would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 22,400 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, operation of the OU-2 groundwater treatment system, and operation of MLWD well N5099 at a flow rate of approximately 1,200 gpm. Figure 7-4 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-2c mass removal information.

7.3.5.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and is operational. Four new groundwater monitoring well clusters in RAA-2c would be installed, and outpost groundwater conditions would be monitored. Monitoring well installation, groundwater treatment system installation, implementation of groundwater monitoring, and operation of the OU-2 and MLWD groundwater treatment systems would be expected to have some impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-2c would be minimized. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 19 years for golf course and remedial wells and more than 30 years for public supply wells (based on current pumping and modeling) (Table 7-3).

7.3.5.6 Implementability

RAA-2c is implementable. Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 treatment system is already constructed. However, this RAA would include the installation of a new treatment system and associated infrastructure at MLWD well N5099 and four new monitoring well clusters, which would require access agreements and permits. MLWD has indicated its willingness to negotiate access to its property to install remedial system infrastructure. Accordingly, RAA-2c was given a technical implementability score of 2 and an administrative implementability score of 4 to bring the overall implementability score to 6 (Table 7-2).

7.3.5.7 Cost Effectiveness

The capital cost for RAA-2c would be approximately $14,000,000 and the 30-year NPV cost would be approximately $39,000,000 (Table 7-4).

7.3.5.8 Consistency with Green Remediation Principles

RAA-2c would involve the installation of a new treatment system at MLWD well N5099 and continued operation of the existing OU-1 and OU-2 treatment systems. The new treatment system would pump site-related, COC-affected groundwater from the aquifer at a flow rate of 1,200 gpm; however, the system effluent would be discharged to the MLWD distribution system for beneficial use. Besides this impact, RAA-2c would involve minimal energy and water requirements, air emissions, impacts to land, material consumption, waste generation, health and safety concerns, and environmental impacts to the surrounding community associated with routine groundwater monitoring, reporting, and management activities.

7.3.6 Alternative 3a—Capture Additional Constituent of Concern Mass

RAA-3a would include institutional controls, continued operation of the OU-2 groundwater treatment system, installation of two new remediation wells (RW300 and EW1D), and expansion of the OU-2 groundwater treatment system. The OU-2 groundwater treatment system includes the extraction of groundwater from remediation well RW100, treatment with an air stripper, vapor-phase treatment, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a total flow rate of approximately 1,000 gpm. RAA-3a would extend the capture zone downgradient

of well RW100 and would further reduce the downgradient migration of OU-2 COCs. The analysis of RAA-3a is summarized in Tables 7-1 and 7-2, and Figure 7-5 shows the locations of the RAA-3a remediation wells, diffusion wells, and the OU-2 groundwater treatment system.

7.3.6.1 Overall Protectiveness of Public Health and the Environment

RAA-3a would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater. RAA-3a would meet the protection of public health RAO.

7.3.6.2 Conformance with SCGs

This section describes how RAA-3a complies with SCGs.

7.3.6.2.1 Chemical-Specific SCGs

RAA-3a would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.6.2.2 Action-Specific SCGs

RAA-3a would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.6.2.3 Location-Specific SCGs

RAA-3a would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-3a would comply with location-specific SCGs.

7.3.6.3 Long-Term Effectiveness and Permanence

RAA-3a would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be future risk of affecting additional downgradient water purveyors.

7.3.6.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-3a would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-3a would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 23,900 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, and operation of the upgraded OU-2 groundwater treatment system. Figure 7-5 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-3a mass removal information.

7.3.6.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and operational. Four new groundwater monitoring well clusters in RAA-3a would be installed, and outpost groundwater conditions would be monitored. Monitoring well and extraction well installation, implementation of groundwater monitoring, and operation of the OU-2 groundwater treatment system would be expected to have some impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-3a would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 19, 27,

and 28 years for golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.6.6 Implementability

RAA-3a is implementable, but it would likely be difficult because piping would need to cross and run along Lakeville Road. Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would not require the installation of additional treatment systems for remediation, but would require the installation of remediation wells RW300 and EW1D, pipelines connecting the wells to the groundwater treatment systems, and four new monitoring well clusters; therefore, a technical implementability score of 3 was assigned for this RAA. In addition, new access agreements and permits would be required to implement RAA-3a. The pipeline would cross and be installed adjacent to Lakeville Road, which would require obtaining access agreements from VLS, Nassau County, the New York State Department of Transportation (NYSDOT), and the Great Neck UFSD. Currently, only VLS has agreed to discuss access to install an extraction well and a pipeline crossing the golf course. An administrative implementability score of 7 was given to RAA-3a, resulting in an overall implementability score of 10 (Table 7-2).

7.3.6.7 Cost Effectiveness

The capital cost for RAA-3a would be approximately $14,000,000. The 30-year NPV cost would be approximately $42,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.6.8 Consistency with Green Remediation Principles

RAA-3a would involve the installation of two new remediation wells and continued operation of the existing OU-1 and OU-2 treatment systems. Remediation wells RW300 and EW1D would be connected via underground piping to OU-2 and OU-1, respectively, and the additional flow would be discharged back into the aquifer. Reinjecting the treated groundwater pumped from the two new remediation wells back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA. Generally, implementing this RAA would require minimal energy and water, air emissions, impacts to land,

material consumption, waste generation, health and safety concerns, and environmental impacts to the surrounding community associated with routine groundwater monitoring, reporting, and management activities.

7.3.7 Alternative 3b—Capture Additional Constituent of Concern Mass

RAA-3b would include institutional controls, continued operation of the OU-2 groundwater treatment system, installation of one new remediation well (RW300) and two new diffusion wells (DW300 and DW301), and construction of a new groundwater treatment system near well RW300 at the northeastern portion of VLSGC. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. RAA-3b would extend the capture zone downgradient of well RW100 and would further reduce the downgradient migration of OU-2 COCs. The analysis of RAA-3b is summarized in Tables 7-1 and 7-2, and Figure 7-6 shows the locations of the RAA-3b remediation wells, diffusion wells, new groundwater treatment system, and the OU-2 groundwater treatment system.

7.3.7.1 Overall Protectiveness of Public Health and the Environment

RAA-3b would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of the site-related, COC-affected groundwater. RAA-3b would meet the protection of public health RAO.

7.3.7.2 Conformance with SCGs

This section describes how RAA-3b complies with SCGs.

7.3.7.2.1 Chemical-Specific SCGs

RAA-3b would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.7.2.2 Action-Specific SCGs

RAA-3b would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.7.2.3 Location-Specific SCGs

RAA-3b would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-3b would comply with location-specific SCGs.

7.3.7.3 Long-Term Effectiveness and Permanence

RAA-3b would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be residual risk of affecting additional downgradient water purveyors.

7.3.7.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-3b would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-3b would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 23,900 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer,

continued operation of the OU-2 groundwater treatment system, and operation of the new groundwater treatment system. Figure 7-6 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-3b mass removal information.

7.3.7.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and operational. Four new groundwater monitoring well clusters in RAA-3b would be installed, and outpost groundwater conditions would be monitored. It is expected that monitoring well, extraction well, and diffusion well installation; implementation of groundwater monitoring; installation of the new groundwater treatment system; and operation of the OU-2 groundwater treatment system would have moderate impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-3b would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 20, 25, and more than 30 years for the golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.7.6 Implementability

RAA-3b is implementable. Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 treatment system is already constructed. This RAA would require the installation of remedial wells RW300 and EW1D, one additional treatment system located near well RW300, two new diffusion wells, and four new monitoring well clusters, which would require access agreements and permits.

A technical implementability score of 2 was given to RAA-3b. There would be no road crossings required in RAA-3b, but access agreements would need to be obtained from VLS to install piping trenches along the northern and western golf course boundaries. Because VLS has indicated a willingness to discuss access to implement this RAA, an administrative implementability score of 4 was assigned to RAA-3b. Accordingly, the overall implementability score for this alternative is 6 (Table 7-2).

7.3.7.7 Cost Effectiveness

The capital cost for RAA-3b would be approximately $20,000,000. The 30-year NPV cost would be approximately $55,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.7.8 Consistency with Green Remediation Principles

Although RAA-3b would consist of the installation of two new remedial wells, two new diffusion wells, and a new treatment system northeast of VLSGC, energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts to the surrounding community associated with this RAA would be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials. Reinjecting the treated groundwater pumped from the two new extraction wells back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if possible, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. The effect on land use would be minimal because all piping would be installed underground and the treatment system would be installed adjacent to a golf course. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reduced vehicle traffic during construction) and associated health and safety concerns.

7.3.8 Alternative 4a—Targeted Hydraulic Control

RAA-4a would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of three new remediation wells (RW400BM [700 gpm], RW400MM [500 gpm], and EW1D [120 gpm]) and four new diffusion wells (DW400 through DW402 and DW402a), and construction of a new groundwater treatment system east of FMCC. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion

wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. RAA-4a would extend the capture zone downgradient of well RW100 to contain the downgradient migration of site-related COCs. The analysis of RAA-4a is summarized in Tables 7-1 and 7-2, and Figure 7-7 shows the locations of the RAA-4a remediation wells, diffusion wells, the new groundwater treatment system, and the OU-2 groundwater treatment system.

7.3.8.1 Overall Protectiveness of Public Health and the Environment

RAA-4a would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of the site-related, COC-affected groundwater. RAA-4a would meet the protection of public health RAO.

7.3.8.2 Conformance with SCGs

This section describes how RAA-4a complies with SCGs.

7.3.8.2.1 Chemical-Specific SCGs

RAA-4a would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.8.2.2 Action-Specific SCGs

RAA-4a would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.8.2.3 Location-Specific SCGs

RAA-4a would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-4a would comply with location-specific SCGs.

7.3.8.3 Long-Term Effectiveness and Permanence

RAA-4a would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be residual risk of affecting additional downgradient water purveyors.

7.3.8.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-4a would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-4a would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 25,500 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, continued operation of the OU-2 groundwater treatment system, and operation of the new groundwater treatment system. Figure 7-7 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-4a mass removal information.

7.3.8.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and is operational. Four new groundwater monitoring well clusters in RAA-4a would be installed, and outpost groundwater conditions would be monitored. It is expected that monitoring, extraction, and diffusion well

installation; installation of the new groundwater treatment system; and operation of the OU-2 groundwater treatment system would have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-4a would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 16, more than 30, and 25 years for the golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.8.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of remedial wells RW400BM, RW400MM, and EW1D, one additional groundwater treatment system located east of FMCC, four new diffusion wells (DW400 through DW402 and DW402a), and four new monitoring well clusters, which would require access agreements and permits.

A technical implementability score of 3 was given to RAA-4a. There are no road crossings required for RAA-4a, but piping would be installed along Community Drive, the southern perimeter of FMCC, and Lakeville Road, which would require access agreements from FMCC, MLWD, and NYSDOT. To date, FMCC has declined to provide access for the installation of any proposed remediation-related infrastructure; therefore, an administrative implementability score of 9 was assigned to RAA-4a. As a result, the overall implementability score for this RAA is 12 (Table 7-2), and the RAA is, therefore, not implementable. Actions taken to gain access are further described in Appendix B.

7.3.8.7 Cost

The capital cost for RAA-4a would be approximately $23,000,000, and the 30-year NPV cost would be approximately $65,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.8.8 Consistency with Green Remediation Principles

Although RAA-4a would consist of the installation of three new extraction wells, four new diffusion wells, and a new treatment system east of FMCC, the associated energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental

impacts associated with the surrounding community would be expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials. Reinjecting the treated groundwater pumped from the three new extraction wells back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-4a would affect land use because it involves the installation of seven new wells and a new treatment system east of FMCC. However, the effect on land use would be minimal because all piping would be installed underground and the treatment system would be installed adjacent to a golf course. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reduced vehicle traffic during construction) and associated health and safety concerns.

7.3.9 Alternative 4b—Targeted Hydraulic Control

RAA-4b would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of three new remediation wells (RW401BM [500 gpm], RW401MM [500 gpm], and EW1D [120 gpm]) and four new diffusion wells (DW404 through DW406 and DW404a), and construction of a new groundwater treatment system south of NSLIJH. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. RAA-4b would extend the capture zone downgradient of remedial well RW100 to contain the downgradient migration of site-related COCs. The analysis of RAA-4b is summarized in Tables 7-1 and 7-2, and Figure 7-8 shows the locations of the RAA-4b remediation wells, diffusion wells, the new groundwater treatment system, and the OU-2 groundwater treatment system.

7.3.9.1 Overall Protectiveness of Public Health and the Environment

RAA-4b would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of the site-related, COC-affected groundwater. RAA-4b would meet the protection of public health RAO.

7.3.9.2 Conformance with SCGs

This section describes how RAA-4b complies with SCGs.

7.3.9.2.1 Chemical-Specific SCGs

RAA-4b would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.9.2.2 Action-Specific SCGs

RAA-4b would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.9.2.3 Location-Specific SCGs

RAA-4b would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-4b would comply with location-specific SCGs.

7.3.9.3 Long-Term Effectiveness and Permanence

RAA-4b would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be a residual risk of affecting additional downgradient water purveyors.

7.3.9.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-4b would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-4b would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 25,500 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, continued operation of the OU-2 groundwater treatment system, and operation of the new groundwater treatment system. Figure 7-8 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-4b mass removal information.

7.3.9.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and is operational. Four new groundwater monitoring well clusters in RAA-4b would be installed, and outpost groundwater conditions would be monitored. Monitoring, extraction, and diffusion well installation; installation of the new groundwater treatment system; and operation of the OU-2 groundwater treatment system would be expected to have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-4b would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be

approximately 17, more than 30, and 25 years for the golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.9.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of remedial wells RW401BM, RW401MM, and EW1D, one additional groundwater treatment system located at NSLIJH, four new diffusion wells (DW404 through DW406 and DW404a), and four new monitoring well clusters, which would require access agreements and permits.

A technical implementability score of 2 was given to RAA-4b. No road crossings would be required and all piping would be installed in the hospital's parking lot for RAA-4b; NSLIJH has indicated willingness to negotiate access to install this RAA's infrastructure. Consequently, RAA-4b was given an administrative implementability score of 4 and an overall implementability score of 6 (Table 7-2), and the RAA is, therefore, implementable.

7.3.9.7 Cost

The capital cost for RAA-4b would be approximately $23,000,000, and the 30-year NPV cost would be approximately $61,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.9.8 Consistency with Green Remediation Principles

Although RAA-4b would consist of the installation of three new extraction wells, four new diffusion wells, and a new treatment system south of NSLIJH, the associated energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts associated with the surrounding community would be expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials. Reinjecting the treated groundwater pumped from the three new extraction wells back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-4b would affect land use because it would involve the installation of seven new wells and a new treatment system south of NSLIJH. However, the effect on land use would be minimal because all piping would be installed underground and the treatment system would be installed at the edge of a parking lot. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reducing vehicle traffic during construction) and associated health and safety concerns.

7.3.10 Alternative 4c—Modified Hydraulic Containment

RAA-4c would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of three new remediation wells (RW300 [800 gpm], RW402 [800 gpm], and EW1D [120 gpm]), installation of four new diffusion wells (DW404, DW405, DW407, and DW408), and construction of a new groundwater treatment system located east of FMCC. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a total flow rate of approximately 500 gpm. RAA-4c would extend the capture zone. The analysis of RAA-4c is summarized in Tables 7-1 and 7-2, and Figure 7-9 shows the locations of the RAA-4c remediation wells, diffusion wells, new groundwater treatment system, and the OU-2 groundwater treatment system.

7.3.10.1 Overall Protectiveness of Public Health and the Environment

RAA-4c would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of the site-related, COC-affected groundwater. RAA-4c would meet the protection of public health RAO.

7.3.10.2 Compliance with SCGs

This section describes how RAA-4c complies with SCGs.

7.3.10.2.1 Chemical-Specific SCGs

RAA-4c would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.10.2.2 Action-Specific SCGs

RAA-4c would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.10.2.3 Location-Specific SCGs

RAA-4c would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-4c would comply with location-specific SCGs.

7.3.10.3 Long-Term Effectiveness and Permanence

RAA-4c would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be a residual risk of affecting additional downgradient water purveyors.

7.3.10.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-4c would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-4c would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 19,000 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, continued operation of the OU-2 groundwater treatment system, and operation of the new groundwater treatment system. Figure 7-9 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-4c mass removal information.

7.3.10.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and operational. Five new groundwater monitoring well clusters in RAA-4c would be installed, and outpost groundwater conditions would be monitored. Monitoring, extraction, and diffusion well installation; implementation of groundwater monitoring; installation of the new groundwater treatment system; and operation of the OU-2 groundwater treatment system would be expected to have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-4c would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 16 years for golf course wells and approximately 25 years for remedial and public supply wells (based on current pumping and modeling) (Table 7-3).

7.3.10.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of three new remediation wells (RW300, RW402, and EW1D) located in VLSGC, east of FMCC, and on site, respectively; one new groundwater treatment system east of FMCC; four new diffusion wells (two east of FMCC and two west of DGC); and four new monitoring well clusters, which would require access agreements and permits.

A technical implementability score of 3 was given to RAA-4c. RAA-4c may not be implementable because the pipelines would cross Lakeville Road, LIE, and possibly Little Neck Parkway, and pipelines would be routed along Community Drive, North Service Road, Horace Harding Boulevard, and Lakeville Road, which would require obtaining access agreements from NSLIJH, Nassau County, MLWD, VLS, and NYSDOT. To date, only VLS, NSLIJH, and MLWD have indicated a willingness to discuss and negotiate access to their respective properties; obtaining access agreements from the remaining stakeholders would be difficult. As a result, RAA-4c was given an administrative implementability score of 8 and an overall implementability score of 11 (Table 7-2). RAA-4c may be difficult to implement.

7.3.10.7 Cost Effectiveness

The capital cost for RAA-4c would be approximately $27,000,000, and the 30-year NPV cost would be approximately $69,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.10.8 Consistency with Green Remediation Principles

RAA-4c would consist of the installation of three new extraction wells, four new diffusion wells, and a new treatment system southeast of FMCC. However, the associated energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts associated with the surrounding community are expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials. Reinjecting the treated groundwater pumped from the three new extraction wells back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-4c would affect land use because it involves the installation of seven new wells and a new treatment system southeast of FMCC. However, the effect on land use would be

minimal because all piping would be installed underground and the treatment system would be installed on a golf course. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reducing vehicle traffic during construction) and associated health and safety concerns.

7.3.11 Alternative 4d—Minimize Impact to Public Supply Wells

RAA-4d would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of five new remediation wells (RW400BM [450 gpm], RW400MM [350 gpm], RW403 [1,200 gpm], RW404 [1,000 gpm], and EW1D [120 gpm]) to attempt to attain full containment, installation of eight new diffusion wells (DW404, DW405, and DW409 through DW414), and construction of a new groundwater treatment system at the Korean Church property. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a total flow rate of approximately 500 gpm. RAA-4d would extend the capture zone to attempt to fully contain the plume. The analysis of RAA-4d is summarized in Tables 7-1 and 7-2, and Figure 7-10 shows the locations of the RAA-4d remediation wells, diffusion wells, new groundwater treatment system, and the OU-2 groundwater treatment system.

7.3.11.1 Overall Protectiveness of Public Health and the Environment

RAA-4d would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater. RAA-4d would meet the protection of public health RAO.

7.3.11.2 Compliance with SCGs

This section describes how RAA-4d complies with SCGs.

7.3.11.2.1 Chemical-Specific SCGs

RAA-4d would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.11.2.2 Action-Specific SCGs

RAA-4d would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.11.2.3 Location-Specific SCGs

RAA-4d would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-4d would comply with location-specific SCGs.

7.3.11.3 Long-Term Effectiveness and Permanence

RAA-4d would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, but there would be only minimal residual risk of affecting additional downgradient water purveyors.

7.3.11.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-4d would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-; however as shown in Table 7-5, RAA-4d would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 12,200 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, continued operation of the OU-2 groundwater treatment system, and operation of the new groundwater treatment system 2. Figure 7-10 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-4d mass removal information.

7.3.11.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and operational. The four new groundwater monitoring well clusters in RAA-4d would be installed, and outpost groundwater conditions would be monitored. Monitoring, extraction, and diffusion well installation; implementation of groundwater monitoring; installation of the new groundwater treatment system; and operation of the OU-2 groundwater treatment system would be expected to have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-4d would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 15, 25, and 7 years for golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.11.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of five new remediation wells (RW400BM [450 gpm], RW400MM [350 gpm], RW403 [1,200 gpm], RW404 [1,000 gpm], and EW1D [120 gpm]), one new groundwater treatment system at the Korean Church property, eight new diffusion wells, and four new monitoring well clusters, which would require access agreements and permits.

A technical implementability score of 3 was given to RAA-4d. Additionally, pipelines would cross Lakeville Road, LIE, and possibly Little Neck Parkway, and would also be installed along Community Drive and Horace Harding Boulevard, which would require obtaining access agreements from NSLIJH, Nassau County, MLWD, VLS, Hebrew Academy, and NYSDOT. An access agreement would also be required to install a new treatment system at the Korean Church. Currently, only VLS, MLWD, and NSLIJH have agreed to negotiate access to their respective properties to install remedial infrastructure; obtaining access agreements from the remaining stakeholders would be difficult. As a result, RAA-4d was given an administrative implementability score of 8 and an overall implementability score of 11 (Table 7-2). RAA-4d may be difficult to implement.

7.3.11.7 Cost Effectiveness

The capital cost for RAA-4d would be approximately $35,000,000, and the 30-year NPV cost would be approximately $89,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.11.8 Consistency with Green Remediation Principles

RAA-4d would involve the installation of five new extraction wells, eight new diffusion wells, and a new treatment system at the Korean Church property. However, the associated energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts associated with the surrounding community would be expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials. Reinjecting the treated groundwater pumped from the five new extraction wells back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-4d would affect land use because it involves the installation of 13 new wells and

one new treatment system on a church property. However, the effect on land use would be minimal because all piping would be installed underground and the treatment system would be installed in a parking lot. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reduced vehicle traffic during construction) and associated health and safety concerns.

7.3.12 Alternative 4e—Minimize Impact to Public Supply Wells

RAA-4e would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of four new remediation wells (RW300 [800 gpm], RW401BM [450 gpm], RW401MM [350 gpm], and EW1D [120 gpm]), installation of six new diffusion wells (DW300, DW301, DW404, DW404a, DW405, and DW405a), and construction of two new groundwater treatment systems in the northeast corner of VLSGC and at NSLIJH. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. RAA-4e would extend the capture zone to attempt to fully contain the plume. The analysis of RAA-4e is summarized in Tables 7-1 and 7-2, and Figure 7-11 shows the locations of the RAA-4e remediation wells, diffusion wells, new groundwater treatment systems, and the OU-2 groundwater treatment system.

7.3.12.1 Overall Protectiveness of Public Health and the Environment

RAA-4e would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater. RAA-4e would meet the protection of public health RAO.

7.3.12.2 Compliance with SCGs

This section describes how RAA-4e complies with SCGs.

7.3.12.2.1 Chemical-Specific SCGs

RAA-4e would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.12.2.2 Action-Specific SCGs

RAA-4e would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.12.2.3 Location-Specific SCGs

RAA-4e would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-4e would comply with location-specific SCGs.

7.3.12.3 Long-Term Effectiveness and Permanence

RAA-4e would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be a residual risk of affecting additional downgradient water purveyors.

7.3.12.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-4e would not reduce toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-4e would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 17,800 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, continued operation of the OU-2 groundwater treatment system, and operation of the two new groundwater treatment systems. Figure 7-11 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-4e mass removal information.

7.3.12.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and operational. Five new groundwater monitoring well clusters in RAA-4e would be installed, and outpost groundwater conditions would be monitored. Monitoring, extraction, and diffusion well installation; implementation of groundwater monitoring; installation of the two new groundwater treatment systems; and operation of the OU-2 groundwater treatment system would be expected to have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-4e would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 19, more than 30, and 25 years for golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.12.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of four new remediation wells (at VLSGC, NSLIJH, and on site), two new groundwater treatment systems (at NSLIJH and northeast of VLSGC), six new diffusion wells (two at the western portion of VLSGC and four at NSLIJH), and four new monitoring well clusters, which would require access agreements and permits.

A technical implementability score of 3 was given to RAA-4e. Installing these wells, treatment systems, and piping along the northern and western golf course boundaries and along Community Drive would require obtaining access agreements from NSLIJH, MLWD, VLS, Nassau County, and NYSDOT. An administrative implementability score of 4 was assigned to this RAA because VLS, MLWD, and NSLIJH have indicated a willingness to negotiate access to their respective properties to install remedial infrastructure. The overall implementability score for RAA-4e is 7 (Table 7-2); therefore, this alternative is implementable.

7.3.12.7 Cost Effectiveness

The capital cost for RAA-4e would be approximately $31,000,000, and the 30-year NPV cost would be approximately $80,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.12.8 Consistency with Green Remediation Principles

Although RAA-4e would consist of the installation of four new extraction wells, six new diffusion wells, and two new treatment systems at VLSGC and NSLIJH, the associated energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts associated with the surrounding community would be expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials. Reinjecting the treated groundwater pumped from the four new extraction wells back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-4e would affect land use because it involves the installation of 10 new wells and two new treatment systems at VLSGC and NSLIJH. However, the effect on land use would be minimal because all piping would be installed underground and the treatment systems would be installed on a golf course or in a parking lot. Minimizing work activities on public roadways

would minimize impacts to the surrounding community (e.g., reduced vehicle traffic during construction) and associated health and safety concerns.

7.3.13 Alternative 4f—Minimize Impact to Public Supply Wells

RAA-4f would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of two new remediation wells (RW404 [1,600 gpm] and EW1D [120 gpm]), installation of four new diffusion wells (DW404, DW405, DW409, and DW410), and construction of a new groundwater treatment system at the Korean Church property. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. RAA-4f would extend the capture zone to attempt to fully contain the plume. The analysis of RAA-4f is summarized in Tables 7-1 and 7-2, and Figure 7-12 shows the locations of the RAA-4f remediation wells, diffusion wells, new groundwater treatment system, and the OU-2 groundwater treatment system.

7.3.13.1 Overall Protectiveness of Public Health and the Environment

RAA-4f would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater. RAA-4f would meet the protection of public health RAO.

7.3.13.2 Compliance with SCGs

This section describes how RAA-4f complies with SCGs.

7.3.13.2.1 Chemical-Specific SCGs

RAA-4f would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.13.2.2 Action-Specific SCGs

RAA-4f would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.13.2.3 Location-Specific SCGs

RAA-4f would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-4f would comply with location-specific SCGs.

7.3.13.3 Long-Term Effectiveness and Permanence

RAA-4f would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be a residual risk of affecting additional downgradient water purveyors.

7.3.13.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-4f would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-4f would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 16,900 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer,

continued operation of the OU-2 groundwater treatment system, and operation of the new groundwater treatment system. Figure 7-12 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-4f mass removal information.

7.3.13.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and operational. Four new groundwater monitoring well clusters in RAA-4f would be installed, and outpost groundwater conditions would be monitored. Monitoring, extraction, and diffusion well; implementation of groundwater monitoring; installation of the new groundwater treatment system; and operation of the OU-2 groundwater treatment system would be expected to have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-4f would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 16 years for golf course wells and approximately 25 years for remedial and public supply wells (based on current pumping and modeling) (Table 7-3).

7.3.13.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of a new remediation well (located on the Korean Church property), one new groundwater treatment system (at the Korean Church property), four new diffusion wells (all at NSLIJH), and four new monitoring well clusters, which would require access agreements and permits.

A technical implementability score of 3 was given to RAA-4f. Additionally, pipelines would cross Community Drive and would be installed along Community Drive, North Service Road, and Horace Harding Boulevard. Installing this RAA's components would require obtaining access agreements from NSLIJH, Korean Church, Nassau County, Hebrew Academy, MLWD, VLS, and NYSDOT. Currently, only VLS, MLWD, and NSLIJH have agreed to negotiate access to their properties. Access permission would need to be obtained from the other stakeholders, especially the Korean Church where a new treatment system is proposed. Consequently, an administrative

implementability score of 6 was assigned to this RAA. The overall implementability score for RAA-4f is 9 (Table 7-2); therefore, this alternative may be implementable.

7.3.13.7 Cost Effectiveness

The capital cost for RAA-4f would be approximately $23,000,000, and the 30-year NPV cost would be approximately $64,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.13.8 Consistency with Green Remediation Principles

RAA-4f would involve installing two new extraction wells, four new diffusion wells, and a new treatment system at the Korean Church property. However, the energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts associated with the surrounding community associated with this RAA would be expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials. Reinjecting the treated groundwater pumped from the two new extraction wells back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-4f would affect land use because it would involve the installation of six new wells and a new treatment system on a church property. However, the effect on land use would be minimal because all piping would be installed underground and the treatment system would be installed adjacent to a golf course. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reduced vehicle traffic during construction) and associated health and safety concerns.

7.3.14 Alternative 4g—Targeted Hydraulic Control

RAA-4g would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of one new 120-gpm remediation well (EW1D), four

new diffusion wells (DW411 through DW414), and construction of a new groundwater treatment system near MLWD well N5099 north of FMCC. Well N5099 would be converted to a remediation extraction well and the new treatment system would treat the water, which would then be injected subsurface into diffusion wells located at NSLIJH and in the Macy's parking lot. A new production well and treatment system would be provided to replace water from well N5099. The new production well and treatment system are assumed to be installed at the Chatham site and, following treatment via air stripping, groundwater would be pumped into the MLWD distribution system at IU Willets. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. RAA-4g would extend the capture zone downgradient of remedial well RW100 to contain the downgradient migration of site-related COCs. The analysis of RAA-4g is summarized in Tables 7-1 and 7-2, and Figure 7-13 shows the locations of the RAA-4g remediation wells, the new groundwater treatment system, and the OU-2 groundwater treatment system.

7.3.14.1 Overall Protectiveness of Public Health and the Environment

RAA-4g would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of the site-related, COC-affected groundwater. RAA-4g would meet the protection of public health RAO.

7.3.14.2 Conformance with SCGs

This section describes how RAA-4g complies with SCGs.

7.3.14.2.1 Chemical-Specific SCGs

RAA-4g would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.14.2.2 Action-Specific SCGs

RAA-4g would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.14.2.3 Location-Specific SCGs

RAA-4g would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-4g would comply with location-specific SCGs.

7.3.14.3 Long-Term Effectiveness and Permanence

RAA-4g would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. As part of this RAA, supply well N5099 would be converted to a remediation extraction well, but there would be a residual risk of affecting other downgradient water purveyors.

7.3.14.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-4g would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-4g would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 31,300 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer,

continued operation of the OU-2 groundwater treatment system, and operation of the new groundwater treatment system. Figure 7-13 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-4g mass removal information.

7.3.14.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and is operational. Four new groundwater monitoring well clusters in RAA-4g would be installed, and outpost groundwater conditions would be monitored. Monitoring, extraction, and diffusion well installation; installation of the new groundwater treatment system; installation of a new production well and treatment system (assumed at the Chatham site to replace water from well N5099); and operation of the OU-2 groundwater treatment system would be expected to have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-4g would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 18, 19, and 25 years for the golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.14.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of remediation well EW1D, one additional groundwater treatment system located at MLWD property, four new diffusion wells, a new production well and treatment system (assumed to be installed at the Chatham site to replace water from well N5099), infrastructure to discharge to MLWD distribution system at IU Willets, and four new monitoring well clusters, which would require access agreements and permits.

A technical implementability score of 3 was given to RAA-4g. To date, only NSLIJH and MLWD have agreed to negotiate access to install this RAA's components. Implementing RAA-4g would require obtaining access agreements from the owner of the Macy's property, Nassau County, and NYSDOT. Additionally, pipelines would cross Community Drive and would also be installed adjacent Community Drive East and Community Drive. Consequently, RAA-4g was given an

administrative implementability score of 6 and an overall implementability score of 9 (Table 7-2). This RAA is, therefore, potentially implementable.

7.3.14.7 Cost

The capital cost for RAA-4g would be approximately $22,000,000, and the 30-year NPV cost would be approximately $66,000,000 (Table 7-4).

7.3.14.8 Consistency with Green Remediation Principles

RAA-4g would consist of the installation of one new extraction well, four new diffusion wells, a new treatment system near MLWD well N5099 north of FMCC, and a new production well and treatment system (assumed to be installed at the Chatham site to replace water from well N5099). However, the associated energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts associated with the surrounding community would be expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials. Reinjecting the treated groundwater pumped from the new extraction well back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-4g would affect land use because it would involve the installation of six new wells and a new treatment system north of FMCC and a new production well and treatment system (assumed to be installed at the Chatham site to replace water from well N5099). However, the effect on land use would be minimal because all piping would be installed underground and the treatment system would be installed adjacent to a golf course. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reduced vehicle traffic during construction) and associated health and safety concerns.

7.3.15 Alternative 4h—Modified Hydraulic Containment

RAA-4h would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of two new remediation wells (RW300 [500 gpm] and EW1D [120 gpm]), installation of eight new diffusion wells (DW300, DW301, and DW411 through DW416), and construction of two new groundwater treatment systems in the northeast corner of VLSGC and near MLWD well N5099. Well N5099 would be converted to a remediation extraction well and the new treatment system would treat the water, which would then be injected into diffusion wells located at NSLIJH and in the Macy's parking lot. A new production well and treatment system would be provided to replace water from well N5099. The new production well and treatment system is assumed to be installed at the Chatham site and groundwater, treated using air stripping, would be pumped into the MLWD distribution system at IU Willets. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. RAA-4h would extend the capture zone to attempt to fully contain the plume. The analysis of RAA-4h is summarized in Tables 7-1 and 7-2, and Figure 7-14 shows the locations of the RAA-4h remediation wells, diffusion wells, new groundwater treatment systems, and the OU-2 groundwater treatment system.

7.3.15.1 Overall Protectiveness of Public Health and the Environment

RAA-4h would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater. RAA-4h would meet the protection of public health RAO.

7.3.15.2 Compliance with SCGs

This section describes how RAA-3b complies with SCGs.

7.3.15.2.1 Chemical-Specific SCGs

RAA-4h would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.15.2.2 Action-Specific SCGs

RAA-4h would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.15.2.3 Location-Specific SCGs

RAA-4h would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-4h would comply with location-specific SCGs.

7.3.15.3 Long-Term Effectiveness and Permanence

RAA-4h would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. As part of this RAA, supply well N5099 would be converted to a remediation extraction well, but there would be a residual risk of affecting other downgradient water purveyors.

7.3.15.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-4h would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-4h would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 21,500 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, continued operation of the OU-2 groundwater treatment system, and operation of the two new groundwater treatment systems. Figure 7-14 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-4h mass removal information.

7.3.15.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and operational. Five new groundwater monitoring well clusters in RAA-4h would be installed, and outpost groundwater conditions would be monitored. Monitoring, extraction, and diffusion well installation; implementation of groundwater monitoring; installation of the new groundwater treatment system; installation of a new production well and treatment system (assumed to be installed at the Chatham site to replace water from well N5099); and operation of the OU-2 groundwater treatment system would be expected to have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-4h would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 19, 30, and 25 years for golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.15.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of two new remediation wells (at VLSGC and on site), two new groundwater treatment systems (at MLWD well N5099 and northeast of VLSGC), eight new diffusion wells (two at the western portion of VLSGC and six at NSLIJH and in the Macy's parking lot north of NSLIJH), a new

production well and treatment system (assumed to be installed at the Chatham site to replace water from well N5099), infrastructure to discharge to MLWD distribution system at IU Willets, and four new monitoring well clusters, which would require access agreements and permits. Piping runs along Community Drive East and Community Drive would be required to connect the new diffusion wells to the proposed MLWD treatment system. The new VLSGC diffusion wells and treatment system would be connected via piping installed along the northern and western boundaries of the golf course.

A technical implementability score of 3 was given to RAA-4h. Installing these wells and treatment systems would require obtaining access agreements from NSLIJH, MLWD, VLS, Nassau County, NYSDOT, and commercial properties. Currently, only VLS, MLWD, and NSLIJH have indicated a willingness to negotiate access to their properties to install remedial system infrastructure. Accordingly, an administrative implementability score of 6 was assigned to this RAA. The overall implementability score for RAA-4h is 9 (Table 7-2); therefore, this alternative is potentially implementable.

7.3.15.7 Cost Effectiveness

The capital cost for RAA-4h would be approximately $35,000,000, and the 30-year NPV cost would be approximately $91,000,000 (Table 7-4). The cost of a replacement for MLWD well N5099 is included.

7.3.15.8 Consistency with Green Remediation Principles

RAA-4h would consist of the installation of two new extraction wells, eight new diffusion wells, two new treatment systems at VLSGC and near MLWD well N5099 north of FMCC, and a new production well and treatment system at the Chatham site to replace water from well N5099. However, the associated energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts associated with the surrounding community would be expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials. Reinjecting the treated groundwater pumped from the two new extraction wells back

into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-4h would affect land use because it would involve the installation of 10 new wells and two new treatment systems at VLSGC and north of FMCC. However, the effect on land use would be minimal because all the piping would be installed underground and the treatment systems would be installed at or adjacent to a golf course. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reduced vehicle traffic during construction) and associated health and safety concerns.

7.3.16 Alternative 5a—Modified Hydraulic Containment

RAA-5a would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of five new remediation wells (RW300 [500 gpm], RW400BM [750 gpm], RW400MM [750 gpm], RW403 [1,200 gpm], and EW1D [120 gpm]) and nine new diffusion wells (DW401 through DW406 and DW415 through DW417), and construction of two new groundwater treatment systems at VLSGC and east of FMCC. The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. RAA-5a would extend the capture zone downgradient of remedial well RW100 to contain the downgradient migration of site-related COCs. The analysis of RAA-5a is summarized in Tables 7-1 and 7-2, and Figure 7-15 shows the locations of the RAA-5a remediation wells, diffusion wells, new groundwater treatment systems, and the OU-2 groundwater treatment system.

7.3.16.1 Overall Protectiveness of Public Health and the Environment

RAA-5a would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by site-related COCs, and institutional controls would be implemented at wells that may become

affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of the site-related, COC-affected groundwater. RAA-5a would meet the protection of public health RAO.

7.3.16.2 Conformance with SCGs

This section describes how RAA-5a complies with SCGs.

7.3.16.2.1 Chemical-Specific SCGs

RAA-5a would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)
- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.16.2.2 Action-Specific SCGs

RAA-5a would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.16.2.3 Location-Specific SCGs

RAA-5a would be constructed and implemented with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-5a would comply with location-specific SCGs.

7.3.16.3 Long-Term Effectiveness and Permanence

RAA-5a would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would not protect purveyor well N5099 from being affected by site-related COCs, and there would be a minimal residual risk of affecting additional downgradient water purveyors.

7.3.16.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-5a would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-5a would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 6,400 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, continued operation of the OU-2 groundwater treatment system, and operation of the two new groundwater treatment systems. Figure 7-15 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-5a mass removal information.

7.3.16.5 Short-Term Impacts and Effectiveness

The OU-2 groundwater treatment system is already constructed and is operational. Four new groundwater monitoring well clusters in RAA-5a would be installed, and outpost groundwater conditions would be monitored. Monitoring, extraction, and diffusion well installation; installation of the new groundwater treatment systems; and operation of the OU-2 groundwater treatment system would be expected to have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-5a would be minimized to the extent possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 17, 28, and 7 years for golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.16.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of five remediation wells (RW300, RW400BM, RW400MM, RW403, and EW1D, located at VLSP, north of LIE, VLSGC, east of FMCC, and on site, respectively), two additional groundwater treatment systems (east of FMCC and northeast of VLSGC), nine new diffusion wells (located west of FMCC and at NSLIJH), and four new monitoring well clusters, which would require access agreements and permits that would potentially be difficult to obtain.

A technical implementability score of 3 was given to RAA-5a. Additionally, pipelines would cross Lakeville Road, LIE, and Community Drive and would be installed along Community Drive, Horace Harding Boulevard, and Lakeville Road. Implementing RAA-5a would require obtaining access agreements from FMCC, NSLIJH, MLWD, VLS, VLSP, Nassau County, and NYSDOT. Currently, only VLS, MLWD, and NSLIJH have agreed to negotiate access to their respective properties to install remediation system infrastructure, while FMCC has denied access to the country club. As a result, RAA-5a was given an administrative implementability score of 9 to bring the overall implementability score to 12 (Table 7-2); therefore, this alternative is not implementable.

7.3.16.7 Cost

The capital cost for RAA-5a would be approximately $42,000,000, and the 30-year NPV cost would be approximately $102,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.16.8 Consistency with Green Remediation Principles

RAA-5a would involve the installation of five new extraction wells, nine new diffusion wells, and two new treatment systems northeast of VLSGC and east of FMCC. However, the energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts associated with the surrounding community associated with this RAA would be expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials.

Reinjecting the treated groundwater pumped from the five new extraction wells back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-5a would affect land use because it involves the installation of 14 new wells and two new treatment systems east of FMCC and northeast of VLSGC. However, the effect on land use would be minimal because all the piping would be installed underground and the treatment systems would be installed at golf courses. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reduced vehicle traffic during construction) and associated health and safety concerns.

7.3.17 Alternative 5b—Hydraulic Containment

RAA-5b would include institutional controls, continued operation of the existing OU-2 groundwater treatment system, installation of five new remediation wells to attempt to attain full containment (RW501 [1,000 gpm], RW502 [650 gpm], RW503 [650 gpm], RW504 [1,000 gpm], and EW1D [120 gpm]), installation of nine new diffusion wells (DW501 through DW509), and construction of two new groundwater treatment systems (one located at the northeast corner of VLSGC and one located at NSLIJH). The OU-2 groundwater treatment system includes the extraction of groundwater from extraction well RW100, treatment with an air stripper, and subsurface injection into diffusion wells DW100, DW101, and DW102 at a flow rate of approximately 500 gpm. RAA-5b would extend the capture zone to fully contain the plume. The analysis of RAA-5b is summarized in Tables 7-1 and 7-2, and Figure 7-16 shows the locations of the RAA-5b remediation wells, diffusion wells, new groundwater treatment systems, and the OU-2 groundwater treatment system.

7.3.17.1 Overall Protectiveness of Public Health and the Environment

RAA-5b would be protective of public health concerning the exposure to groundwater because wellhead treatment has already been implemented at supply wells that are currently affected by

site-related COCs, and institutional controls would be implemented at wells that may become affected in the future. Additionally, the OU-2 groundwater treatment system has reduced the downgradient migration of site-related, COC-affected groundwater. RAA-5b would meet the protection of public health RAO.

7.3.17.2 Conformance with SCGs

This section describes how RAA-5b complies with SCGs.

7.3.17.2.1 Chemical-Specific SCGs

RAA-5b would comply with all chemical-specific SCGs, except those that relate to ambient water quality. This RAA would not comply with:

- CWA – Ambient Water Quality Criteria (40 CFR Part 131; EPA – 440/5-86/001 Quality Criteria for Water – 1986, superseded by EPA-822-R-02-047 National Recommended Water Quality Criteria: 2002)

- NYSDEC Ambient Water Quality Standards and Guidance Values (Division of Water TOGS 1.1.1 [1998, revised 2000])

If downgradient water purveyors become affected by site-related COCs, institutional controls would be provided to ensure compliance with drinking water standards.

7.3.17.2.2 Action-Specific SCGs

RAA-5b would be designed, constructed, and implemented to comply with all action-specific SCGs.

7.3.17.2.3 Location-Specific SCGs

RAA-5b would be constructed and implemented in accordance with all of the appropriate local building permits and would comply with Section 14.09 of the New York Preservation of Historic Structures or Artifacts location-specific SCGs. RAA-5b would comply with location-specific SCGs.

7.3.17.3 Long-Term Effectiveness and Permanence

RAA-5b would meet RAOs in the long-term because institutional controls would be provided to site-related, COC-affected purveyor wells. This RAA would protect MLWD well N5099 and WAGNN wells N4388 and N12796 from being affected by site-related COCs.

7.3.17.4 Reduction of Toxicity, Mobility, or Volume of Contamination through Treatment

RAA-5b would not reduce the toxicity or mobility of site-related, COC-affected groundwater throughout OU-2; however as shown in Table 7-5, RAA-5b would reduce the volume of site-related, COC-affected groundwater after 30 years from approximately 73,700 acre-feet to approximately 4,000 acre-feet by the continued operation of the OU-1 groundwater treatment system with the new remediation well (EW1D) in the basal portion of the Magothy aquifer, continued operation of the OU-2 groundwater treatment system, and operation of the two new groundwater treatment systems. Figure 7-16 illustrates the 30-year groundwater model-predicted 5 µg/L TVOC concentration contour, and Appendix A provides the RAA-5b mass removal information.

7.3.17.5 Short-Term Impact and Effectiveness

The OU-2 groundwater treatment system is already constructed and operational. Four new groundwater monitoring well clusters in RAA-5b would be installed, and outpost groundwater conditions would be monitored. Monitoring, extraction, and diffusion well installation; implementation of groundwater monitoring; installation of the new groundwater treatment systems; and operation of the OU-2 groundwater treatment system would be expected to have a high impact on the public, the workers, and the environment, but adverse short-term effects associated with implementing RAA-5b would be minimized as much as possible. The length of time required to achieve RAOs in OU-2 groundwater would be approximately 16, 26, and 7 years for golf course, remedial, and public supply wells, respectively (based on current pumping and modeling) (Table 7-3).

7.3.17.6 Implementability

Treatment systems are already installed at site-related, COC-affected purveyor wells, and the OU-2 groundwater treatment system is already constructed. This RAA would require the installation of five new remediation wells, two additional groundwater treatment systems located at northeast corner of VLSGC and at NSLIJH, nine new diffusion wells, and four new monitoring well clusters, which would require access agreements and permits.

A technical implementability score of 4 was given to RAA-5b. Additionally, pipelines would cross Lakeville Road, LIE, Community Drive, and Northern Boulevard and would be installed along Community Drive, Northern Boulevard, Lakeville Road, Horace Harding Boulevard, and numerous residential streets, which would require obtaining access agreements from VLSGC, DGC, Korean Church, Nassau County, NYSDOT, and area neighborhoods. The difficulty of obtaining access agreements from area neighborhoods is the main reason that RAA-5b is not implementable. Initial conversations with residents of the area neighborhoods have revealed that there will be significant reluctance to issue access agreements to allow the installation of treatment systems and pipelines. As a result, RAA-5b was assigned an administrative implementability score of 10 to bring the overall implementability score to 14 (Table 7-2), the highest, and hence the least implementable, among all evaluated RAAs.

7.3.17.7 Cost Effectiveness

The capital cost for RAA-5b would be approximately $34,000,000, and the 30-year NPV cost would be approximately $97,000,000 (Table 7-4). The cost for providing well head treatment on MLWD well N5099 is included.

7.3.17.8 Consistency with Green Remediation Principles

RAA-5b would consist of the installation of five new extraction wells, nine new diffusion wells, and two new treatment systems at NSLIJH and northeast of VLSGC. However, the energy and water requirements, air emissions, impacts to land, health and safety concerns, and environmental impacts associated with the surrounding community associated with this RAA would be expected to be minimal. The required routine VPGAC change-outs would result in moderate material use and waste generation and the associated impacts from transportation of treatment materials.

Reinjecting the treated groundwater back into the subsurface would create an aquifer water balance and would reduce water discharge, thereby lowering water impacts associated with this RAA.

Air emissions would be minimized by using local suppliers for infrastructure construction materials and using trucks and heavy machinery that run on biofuels, if available, to haul construction and treatment (VPGAC) materials to the site and generated wastes off site for disposal. RAA-5b would affect land use because it involves the installation of 14 new wells and two new treatment systems at NSLIJH and VLSGC. However, the effect on land use would be minimal because all the piping would be installed underground and the treatment systems would be installed at golf courses. Minimizing work activities on public roadways would minimize impacts to the surrounding community (e.g., reduced vehicle traffic during construction) and associated health and safety concerns.

7.4 SUMMARY OF REMEDIAL ACTION ALTERNATIVES EVALUATION

After performing the above detailed analysis of the 16 RAAs, five were determined to be implementable for OU-2: RAA-1, RAA-2a, RAA-2b, RAA-2c, and RAA-3b. All of the RAAs were found to be protective of public health because institutional controls have already and will continue to include providing wellhead treatment (where necessary) at purveyor wells and at a golf course irrigation well that have or will become affected above groundwater SCG values during implementation of the remedy. Each of the RAAs is also equally protective of the environment because no surface waters will become affected and each RAA removes approximately 30,000 pounds of COC mass in the 30-year evaluation period (Table 7-5). All RAAs comply with action-, location-, and chemical-specific SCGs. The RAAs are all effective in the long-term. However, the alternatives are not projected to achieve the water quality RAO throughout OU-2 within 30 years. None of the RAAs reduce the toxicity (the COCs are not made less toxic in groundwater because their chemical compositions are not altered by the remediation processes) or mobility (the physical parameters of the aquifer are not affected by remediation) of site-related, COC-affected groundwater throughout OU-2 within 30 years. All of the RAAs reduce the volume of site-related, COC-affected groundwater throughout OU-2 from approximately 73,700 acre-feet to a maximum

residual volume of approximately 36,200 acre-feet for RAA-1 and a minimum residual volume of approximately 4,000 acre-feet for RAA-5b.

The short-term impact and effectiveness evaluation of the RAAs included consideration of adverse effects on the community while implementing the remedy and the anticipated time required to achieve RAOs throughout OU-2. The short-term adverse effects on the community during implementation of the five implementable RAAs is as follows: four are classified as having minimal impact (RAA-1, RAA-2a, RAA-2b, and RAA-2c), and one (RAA-3b) is classified as having moderate impact. All of the remaining 11 RAAs that are not considered to be implementable have high impacts on the public during implementation.

The time to achieve the RAOs in the five implementable RAAs is indeterminate for RAA-1 and greater than 30 years for the others.

The 30-year NPV cost per pound of COC removed for the five implementable RAAs ranged from $300 (RAA-1) to $1,800 (RAA-3b). Although each of the RAAs have provisions that protect public health and the environment and most remove approximately the same quantity of contaminant mass, cost-effectiveness varies greatly among the RAAs.

The five implementable RAAs are the most sustainable of the 16 RAAs evaluated. This is mainly because of the complexity associated with infrastructure installation of the other RAAs, which also means they are not cost-effective. All of the RAAs achieve beneficial re-use of the treated groundwater via subsurface injection or use by a purveyor or golf course.

The next section recommends a remedy from the five RAAs that are deemed implementable.

Section 8
Recommended Remedy

This section evaluates the RAAs and presents the recommended remedy.

8.1 EVALUATION CRITERIA

An evaluation of each of the RAAs against seven of the eight evaluation criteria was presented in Section 7 as required by the DER-10 (NYSDEC 2010b) guidelines (the eighth criterion—community acceptance—will be evaluated once public comments have been received and addressed). In addition to the evaluation criteria required by DER-10, the RAAs are each evaluated for consistency with green remediation principles as required by DER-31 (NYSDEC 2010c). Because the RAAs are similar (i.e., each RAA uses the same remediation technologies, but differ in the number and location of remedial wells, diffusion wells, and treatment systems), the evaluation outcome for six of the eight criteria is analogous for all of the RAAs. Therefore, the six evaluation criteria—overall protectiveness of public health and the environment; conformance with SCGs; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume of contamination through treatment; short-term impact and effectiveness; and consistency with green remediation principles—are not discriminators because they have comparable evaluation scores for the RAAs during the 30-year evaluation period. Thus, the remaining two criteria—implementability and cost-effectiveness—are the primary discriminators used to determine the appropriate remedy for OU-2.

8.2 PRIMARY DISCRIMINATORS

As presented above and summarized in Table 8-1, the two primary discriminators are implementability and cost-effectiveness. A detailed discussion of each primary discriminator is presented in the sections below.

8.2.1 Implementability

As mentioned in Section 2, groundwater in OU-2 is located beneath a densely populated area with many structures and facilities with high-use infrastructure. This creates a challenge with implementing the final remedy. Gaining access to public and private properties to install the necessary infrastructure and operate the remediation systems may be difficult. Several of the alternatives evaluated would require the installation of infrastructure adjacent to or beneath major public roadways and highways, such as LIE, Lakeville Road, and Community Drive and adjacent to or beneath golf courses and public institutions, such as NSLIJH and the Hebrew Academy.

As mentioned in Section 6.2.2, the implementability criterion encompasses the technical and administrative feasibility of executing a RAA with associated process options. Technical implementability pertains to the difficulties associated with infrastructure construction and site availability for the RAAs with associated process options. For this FS, each RAA was given a technical implementability score from 1 to 4, with 1 being the easiest to construct. Administrative implementability mainly involves obtaining access to properties where extraction/diffusion wells and treatment system components of each RAA would need to be installed. For this FS, each RAA was assigned an administrative implementability score from 1 to 10, with 1 corresponding to the highest likelihood of negotiating and obtaining access to construct the required infrastructure. The overall implementability score is the aggregate of the technical and administrative implementability scores (ranging from 2 to 14). At the end of Section 7, five RAAs were retained because they were determined to be implementable with an implementability score of 6 or less. The implementability score for each RAA is presented in Table 8-1.

8.2.2 Cost Effectiveness

The cost for each RAA was presented in Section 7. NPV costs for each RAA and NPV costs per pound recovered by pumping wells are presented in Table 8-1. Thirty-year NPV costs ranged from $9,000,000 (RAA-1) to $102,000,000 (RAA-5a). The NPV cost per pound removed ranged from a low of $300 for RAA-1 to a high of $3,100 for RAA-5a.

8.3 RECOMMENDED REMEDY

As presented above and summarized in Table 8-1, the two primary discriminators are implementability and cost-effectiveness. The recommended remedy is RAA-2c based on the following discriminators:

- It has an implementability score of 5, which indicates that it can be implemented.
- A preliminary commitment has been obtained from MLWD for the implementation of RAA-2c, assuming NYSDEC and NYSDOH approval. A draft agreement is in negotiations between MLWD and Lockheed Martin that supports this option and will allow for the construction of a new treatment system without additional stakeholder negotiations. For the two reasons above, RAA-2c is the alternative that can be implemented in the shortest period of time, yet provides comparable hydraulic control and minimization of site-related COC migration to many other RAAs.
- It removes a similar quantity of site-related COC mass (approximately 31,000 pounds) as compared to the other RAAs.
- Reduces the volume of site-related, COC-affected groundwater from approximately 73,700 acre-feet to approximately 22,400 acre-feet—a reduction of approximately 70 percent, which is the largest reduction of the implementable RAAs (Table 8-2).
- It is one of the most cost-effective RAAs ($1,300 per pound on an NPV basis) based on an evaluation of NPV cost per pound of site-related COC mass removed.
- It allows MLWD to continue to use N5099—a critical water purveyor well—albeit at an increased flow rate.
- It is the most sustainable of the RAAs that include a new treatment system because it maintains beneficial use through treatment and eliminates the need to pump water to the surface twice, once for treatment and again to supply wells after the treated water is injected into the subsurface.

- It assists in maintaining both water quality and affordability of water to MLWD's customers within the service area.

- It is expected to have the lowest impact to the community during construction and operations and to involve the least consumption of resources during the implementation, which translates into the most sustainable solution using green principles.

- It is protective of public health and the environment since no one will be exposed to site-related COCs and affected groundwater will not affect lakes, ponds, or the surface water management system.

In addition RAA-2c is the last element of a larger strategy to remediate the site-related, COC-affected groundwater from the former Unisys site. There are several other components that, when combined with RAA-2c, constitute the overall remedy for the site-related, COC-affected groundwater. The other components are source control, groundwater P&T, and the implementation of institutional controls. Source control has involved the removal of site-related, COC-affected soil and the implementation of an SVE system to recover residual site-related COC mass in the source area. Groundwater P&T includes the upgraded OU-1 system designed to minimize the further migration of site-related COCs from the site; the installation of the OU-2 IRM that is designed to recover as much site-related COC mass from a "hot spot" in the off-site COC-affected groundwater; and the "on call" system that will be installed as necessary for the VLSGC irrigation well to prevent site-related, COC-affected groundwater from entering Lake Surprise. Existing deed restrictions prevent contact with COC-affected sediment in the on-site stormwater basins. Because RAA-2c accomplishes the goals set out for the OU-2 remedy at a reasonable cost and, when combined with other remedial components, constitutes an effective remedy for the site-related COC-affected groundwater, Lockheed Martin requests that it be selected as the recommended RAA for OU-2.

Section 9
References

1. ARCADIS. 1999. Supplemental OU-2 Remedial Investigation Work Plan.

2. ARCADIS. 2003. OU-2 IRM South System Groundwater Remediation Work Plan. May 29, 2003.

3. ARCADIS. 2008. Draft Feasibility Study, Operable Unit 2. July 14, 2008.

4. ARCADIS. 2012. Remedial Investigation Report, Operable Unit No 2 for the Unisys Site, Great Ceck, New York May 2012.

5. H2M Group. 1998. OU-2 Remedial Investigation/Feasibility Study (RI/FS) Work Plan. Lockheed Martin Corporation, Great Neck, New York. NYSDEC Site No. 130045.

6. Lockheed Martin Corporation. 2003. Non-Detect Performance Standard described in the Access Agreement.

7. McClymonds and Frank. 1972. Water Transmitting Properties of Aquifers on Long Island, New York, US Geological Survey Professional Paper 627-E.

8. New York State Department of Environmental Conservation. 1990. Technical and Administrative Guidance Memorandum HWR 90-4030, Selection of Remedial Actions at Inactive Hazardous Waste Sites. Division of Hazardous Waste Remediation.

9. New York State Department of Environmental Conservation. 1991. Administrative Order on Consent (Consent Order No. W-1-0527-91-02). November.

10. New York State Department of Environmental Conservation. 1997. Record of Decision, Lockheed Martin Tactical Systems, Inc. Site, Operable Unit 1, Lake Success and Town of North Hempstead, Nassau County, Site Number 1-30-45.

11. New York State Department of Environmental Conservation. 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.

12. New York State Department of Environmental Conservation. 1999. Technical Guidance for Screening Contaminated Sediments.

13. New York State Department of Environmental Conservation. 2010a. Website located at http://www.dec.ny.gov/chemical/8654.html. July 1.

14. New York State Department of Environmental Conservation. 2010b. DER-10, Technical Guidance for Site Investigation and Remediation. Division of Environmental Remediation.

15. New York State Department of Environmental Conservation. 2010c. DER-31, Green Remediation.

16. New York State Department of Environmental Conservation. 2005.

17. New York State Department of Environmental Conservation. 2008. NYSDEC Environmental Resource Mapper.

18. New York State Department of Health. 2006.

19. Suffolk Country Department of Environmental Control. 1970. Long Island Water Resources Bulletin 2. Prepared by the US Department of Interior, Geological Survey.

20. Suffolk County Water Authority. 1974. Long Island Water Resources Bulletin 5. Prepared by the US Department of Interior Geological Survey.

21. Swarzenski, W. 1963. Hydrogeology of Northwestern Nassau and Northeastern Queens Counties, Long Island, New York. US Geological Survey Water-Supply Paper 1657.

22. United States Environmental Protection Agency. 1988a. Guidance for Conducting RI/FS Studies Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Interim Final.

23. United States Environmental Protection Agency. 1988b. Guidance for Remedial Actions for Contaminated Groundwater and Superfund Sites.

24. United States Environmental Protection Agency. 1989. Superfund; Volume I: Human Health Evaluation Manual. Part A. U.S. Environmental Protection Agency. Office of Emergency and Remedial Response. Washington, DC, EPA/540/I-89/002. December.

25. United States Environmental Protection Agency. 1993. Remediation Technologies Screening Matrix and Reference Guide.

26. United States Environmental Protection Agency. 1995. Policy for Risk Characterization at the U.S. Environmental Protection Agency. U.S. Environmental Protection Agency, Office of the Administrator, Washington, D.C. March.

27. United States Environmental Protection Agency. 1997. Exposure Factors Handbook. Volumes I, II, and III. U.S. Environmental Protection Agency, Office of Health and Environmental Assessment, Washington, DC, EPA/600/P-95/002Fa,b,c. August.

28. United States Environmental Protection Agency. 1998. Risk Assessment Guidance for Superfund (RAGS); Volume I, Human Health Evaluation Manual, Part D. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC, Interim Publication No. 9285.7-01D. January.

29. United States Environmental Protection Agency. 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC, EPA/540/R/99/005. July.

30. United States Environmental Protection Agency. 2008. Technology Primer -Green Remediation: Incorporating Sustainable Environmental Practices into Remediation of Contaminated Sites, Office of Solid Waste and Emergency Response, EPA 542-R-08-002. April.

31. United States Environmental Protection Agency. 2009.

32. U.S. Geological Survey. 1984. Water Resources Investigations Report 86-4189.

33. U.S. Geological Survey. 1999. Ground-Water Resources of Kings and Queens Counties, Long Island, New York, US Geological Survey Water Supply Paper 2498.

Section 10
Glossary

access agreement: an agreement between a property owner and other entity (in this case Lockheed Martin) that allows access for the installation of infrastructure or environmental sampling

Administrative Order on Consent: a legal agreement signed by United States EPA and an individual, business, or other entity through which the violator agrees to pay for correction of violations, take the required corrective or cleanup actions, or refrain from an activity. It describes the actions to be taken, may be subject to a comment period, applies to civil actions, and can be enforced in court

advanced oxidation: refers to a group of chemical treatment techniques designed to remove organic and inorganic constituents of water and wastewater by oxidation

air sparge/sparging: the process of injecting air directly into the groundwater to volatilize contaminants and enhance biodegradation

air stripper/stripping: the process of forcing air through polluted groundwater or surface water to remove volatile and semi-volatile contaminants

basal Magothy**:** the portion of the Magothy aquifer generally existing between 200 feet below mean sea level and the upper surface of the Raritan confining unit. This aquifer horizon is generally characterized by medium to coarse grained sand and gravel.

capital costs: costs incurred for the purchase of land, buildings, construction, and equipment needed for the production of goods or the rendering of services

capture zone: the zone of hydraulic containment beyond which a groundwater contaminant will not migrate

Clean Water Act: the cornerstone of surface water quality protection in the United States, it employs a variety of regulatory and non-regulatory tools to significantly reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff

Code of Federal Regulations: the document that codifies all rules of the executive departments and agencies of the federal government. It is divided into fifty volumes, known as titles. Title 40 of the CFR (referenced as 40 CFR) lists all environmental regulations.

Comprehensive Environmental Response, Compensation, and Liability Act: was enacted by the United States Congress on December 11, 1980 to create a tax on the chemical and petroleum industries and to provide broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment

concentration contour: a line consisting of sample points exhibiting the same isolate concentration of constituent of concern

constituents of concern: specific chemicals that are identified for evaluation in a site assessment process

containment: refers to general response action performed to control migration of constituents of concern in groundwater

deed restriction: a restriction on the deed that place limitations on the use of the property

diffusion well: a well that is designed for the reinjection of water into an aquifer; usually water from a groundwater-based air conditioning system or for treated water.

discharge/re-use: refers to general response actions used to manage site-related, constituent of concern-affected groundwater

dry well: a subsurface structure constructed for liquid disposal

engineering controls: techniques for managing environmental and health risks by placing a barrier between the contamination and the rest of the site, thus limiting exposure pathways

Enhanced Reductive Dechlorination: the process of injecting an electron donor (e.g., molasses, lactate), nutrients, and potentially dechlorinating microorganisms (i.e., bioaugmentation) into the subsurface

environmental easement: an enforcement mechanism used for property where the remedial program leaves residual contamination that makes the property suitable for some, but not all uses, or includes engineering controls that must be maintained to be effective

ex-situ: removal of the contaminated material for its original place to be treated elsewhere

exposure pathway: the path from sources of pollutants via, soil, water, or food to man and other species or settings

extraction well: a discharge well used to remove groundwater or air

fate and transport: models used by risk assessors to estimate the movement and chemical alteration of contaminants as they move through environmental media (e.g., air, soil, water, groundwater)

Feasibility Study: a study presenting the description and analysis of the practicability of potential cleanup alternatives for a site and ending with a recommendation for the selection of a cost-effective alternative

final remedy: a treatment technology or alternative selected during the feasibility study process.

General Response Actions: actions, singly or in combination, that may be taken to satisfy the remedial action objectives for a site

groundwater model: a computer model of groundwater flow systems used by hydrogeologists to simulate and predict aquifer conditions

groundwater plume: an underground pattern of contaminant concentrations created by the movement of groundwater beneath a contaminant source

Human Health Exposure Assessment and Ecological Evaluation: Assessments conducted consistent with NYSDEC guidance to provide citizens and regulators with information about potential exposure pathways for site-related compounds that may be linked to health problems.

hydraulic conductivity: the rate at which water can move through a permeable medium. (i.e. the coefficient of permeability)

hydraulic containment/control: a condition in which subsurface hydraulic gradients are created to influence or control the movement/migration of groundwater within a defined area of the groundwater system. Typically, such a condition is created via operation of groundwater pumping and/or diffusion wells.

impacted: media (e.g. soil, groundwater, air) or resources with contamination resulting from site activities

implementability: the technical and administrative feasibility of setting in place a remedial technology

in-situ: in its original place, unmoved, unexcavated, or remaining at the site or in the subsurface

in-situ chemical oxidation: an aggressive technology that involves the injection of chemical oxidants that destroy organic compounds in groundwater

institutional controls: any non-physical means of enforcing a restriction on the use of real property that limits human or environmental exposure, restricts the use of groundwater, provides notice to potential owners, operators, or members of the public, or prevents actions that would interfere with the effectiveness of a remedial program or with the effectiveness and/or integrity of site management activities at or pertaining to a site.

Interim Remedial Measure: a discrete set of planned actions for both emergency and non-emergency situations that can be conducted without the extensive investigation and evaluation of a Remedial Investigation/Feasibility Study

irrigation well: a well from which water is pumped for the purpose of irrigating crops or, in this case, golf course grass.

liquid-phase adsorption: the process of attracting atoms or molecules from an adjacent liquid to an exposed solid surface

liquid-phase granular activated carbon: a form of carbon that has been processed to make it extremely porous and thus to have a very large surface area available for adsorption and removal of atoms or molecules from a liquid stream

Magothy aquifer: the main water producing aquifer of the Long Island groundwater system. It is typically composed of sand, silt, and gravel, with some clay lenses, is hundreds of feet thick, and is located between the upper Glacial aquifer and the Raritan confining unit.

mass removal: amount of constituents of concern removed by a treatment system

Maximum Contaminant Level: the maximum enforceable, permissible level of a contaminant in water delivered to any user of a public system

mean sea level: a measure of the average height of the ocean's surface, used as a standard in estimating land elevation

middle Magothy: the portion of the Magothy aquifer directly overlying the basal Magothy horizon. For the purposes of this report, it generally exists between elevations of 110 to 200 feet below mean sea level.

monitored natural attenuation: remediation of groundwater through natural processes (e.g., biodegradation, dispersion, and adsorption) without active intervention

monitoring well: (1) a well used to obtain water quality samples or measure groundwater levels or (2) a well drilled at a hazardous waste management facility or Superfund site to collect groundwater samples for physical, chemical, or biological analysis to determine the amounts, types, and distribution of contaminants in the groundwater

municipal supply well: a well that it is operated by a municipality or water district that supplies water (for drinking and other purposes) to a specific service area.

National Contingency Plan: the federal regulation that guides determination of the sites to be corrected under both the Superfund program and the program to prevent or control spills into surface waters or elsewhere

net present value: the present value of an investment's future net cash flows minus the initial investment

no action: a general response action which involves no or minimal remedial efforts and is included in a feasibility study as a baseline for comparison with other alternatives.

Operable Unit: a portion of the remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination

permeable reactive barrier: a barrier that provides *in-situ* treatment of groundwater and is designed to intercept affected groundwater flow

phytoremediation: the use of green plants to remove pollutants from the environment or render them harmless

potassium permanganate-impregnated zeolite: an adsorbent medium generally used for treating organic compounds and acid vapors

preliminary remediation/remedial goals: screening levels for contaminants in environmental media (e.g., soil, water, groundwater)

process option: a component of a treatment technology. For example, air stripping and activated carbon adsorption are processes grouped with the technology “physical treatment” for groundwater.

Publicly Owned Treatment Works: a waste treatment works owned by a state, unit of local government, or Indian tribe, usually designed to treat domestic wastewaters

pumping with treatment: a common method for cleaning up groundwater where pumps are used to bring polluted groundwater to the surface where it can be cleaned more easily

pumping test: also know as an aquifer test, a common tool used by hydrogeologists to characterize an aquifer by "stimulating" the aquifer through constant pumping and observing the aquifer's "response" (drawdown) in observation wells

purveyor well: a groundwater extraction well used by a public utility, mutual water company, county water district, or municipality to provide drinking water to customers

Record of Decision: a public document that explains which cleanup alternative(s) will be used at National Priorities List sites where, under CERCLA, Trust Funds pay for the cleanup

recovery well: a well that is designed to pump contaminated groundwater for treatment purposes.

remedial action alternative/remedial alternative: a combination of remediation technologies and process options that are potentially applicable for the cleanup of a contaminated site

remedial action objectives/remedial objectives: medium-specific or operable unit-specific goals for protecting human health and the environment at a contaminated site

remedial investigation: an in-depth study designed to gather data needed to determine the nature and extent of contamination at a Superfund site, establish site cleanup criteria, identify preliminary alternatives for remedial action, and support technical and cost analyses of alternatives

remedial technology: a technology used for the removal of pollutants or contaminants for the general protection of human health and the environment

remediation well: a groundwater extraction well used as a part of a groundwater remediation system

removal: refers to general response actions which are aimed at removing impacted medium/media from a site

soil vapor extraction: an *in-situ* process for soil remediation where contaminants are removed by stripping to a medium such as air or steam. The extracted soil vapors are separated into liquids and vapors to be treated as necessary

sole-source aquifer system: an aquifer that supplies 50-percent or more of the drinking water of an area

standards, criteria, and guidance: standards and criteria are generally cleanup standards and environmental requirements that are enacted by federal and/or state law, whereas guidance refers to non-promulgated criteria and advisories.

State Pollutant Discharge Elimination System: a New York State program for the control of wastewater and stormwater discharges in accordance with the Clean Water Act.

stormwater retention basin: a type of best management practice used to manage stormwater runoff to prevent flooding and downstream erosion, and improve water quality in an adjacent river, stream, lake or bay.

sub-slab depressurization system: a system consisting of a fan or a blower which draws air from the soil beneath a building to prevent soil gases from infiltrating structures located above subsurface contamination

subsurface injection: emplacement of a liquid stream into the vadose zone or water table

Target Compound List: a specific list of chemicals that regulatory agencies require to be analyzed by someone undertaking an environmental investigation at a hazardous waste or Superfund site.

treatment: the implementation of *in-situ* or *ex-situ* technologies to clean up media (air, soil, groundwater) affected by site-related constituents of concern

vapor intrusion: a process by which chemicals in soil or groundwater migrate to indoor air above a contaminated site

volatile organic compound: an organic chemical compound which has a high vapor pressure and which can affect the environment and human health

vapor-phase granular activated carbon: a form of carbon that has been processed to make it extremely porous and thus to have a very large surface area available for adsorption and removal of atoms or molecules from a vapor stream

vertical hydraulic gradient: vertical component of groundwater flow

water purveyor: a public utility, mutual water company, county water district, or municipality that delivers drinking water to customers

well cluster: a group of wells installed in the same vicinity

wellhead treatment: treatment before use or discharge at a single or group of wells

Tables

Table 3-1
Well Construction Details and Survey Coordinates for Wells Within a 2.5-Mile Radius (downgradient) of the Former Unisys Facility
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Well Designation	Date Installed	Total Depth (feet bls)	Well Diameter (inches) top/bottom	X-Coordinate NAD 83[1]	Y-Coordinate NAD 83[1]	Measuring Point Elevation NAVD 88[2] (feet relative to msl)	Land Surface Elevation (feet relative to msl)	Screened Interval (feet bls)	Notes or Well Use as per Well Completion Report	Screened Aquifer
Extraction/Recovery Wells										
EW1	August 42	235	12/8/4	1066747	215913	134.66	142[4]	199 to 229	Recovery	UM
RW1RS	June 00	205	12	1067515	215810	138.33	140[4]	144 to 164	Recovery	UG/UM
								172 to 202		
RW1RD	May 00	271	12	1067509	215772	136.75	140[4]	238 to 268	Recovery	UM/MM
RW100	September 03	329.5	12	--	--	151.2	157[4]	190 to 210	Recovery	UM/MM
Monitoring Wells										
1GU	May 88	115	2	1067616	215747	141.35	--	105 to 115	Monitoring	UG
1GL	May 88	147	4	1067608	215762	141.44	--	127 to 147	Monitoring	UG
1MI	May 88	255	4	1067608	215762	141.71	--	235 to 255	Monitoring	UM
1MI/L	May 89	342	4	1067608	215762	141.74	--	322 to 342	Monitoring	MM/BM
1ML	May 91	395	4	1067608	215762	141.96	--	390 to 400	Monitoring	BM
2GL	May 88	147	4	1068291	214583	126.17	--	127 to 147	Monitoring	UM
2MU	July 91	185	4	1068060	214496	126.41	--	175 to 185	Monitoring	UM
2MI	April 89	250	4	1068291	214583	125.88	--	230 to 250	Monitoring	MM
2ML	August 94	447	4	1068120	214475	125.58	--	397 to 407	Monitoring	BM
3GL	May 88	149	4	1067847	213990	136.10	--	129 to 149	Monitoring	UG
3ML	July 94	350	4	1067847	213990	136.69	--	325 to 335	Monitoring	BM
4GL	May 88	150	4	1066212	215279	141.13	--	130 to 150	Monitoring	UG
4MI	March 89	250	4	1066212	215279	141.36	--	230 to 250	Monitoring	UM
5GU	January 92	95	4	1067373	214064	130.77	--	74 to 94	Monitoring	UG
5GL	February 89	130	4	1066913	213950	129.55	--	110 to 130	Monitoring	UG
5MI	February 89	250	4	1066913	213950	129.56	--	239 to 250	Monitoring	MM
5ML	July 94	350	4	1066913	213950	128.26	--	325 to 335	Monitoring	BM
6GL	February 89	125	4	1066740	214320	124.80	--	105 to 125	Monitoring	UG
6MI	July 91	240	4	1066650	214560	125.36	--	215 to 235	Monitoring	UM
7GL	March 89	150	4	1066305	215925	148.55	--	130 to 150	Monitoring	UG
7MU	February 04	248	4	1066298	215902	149.53	--	238 to 248	Monitoring	UM
7ML	June 94	355	4	1066305	215925	148.15	--	323 to 333	Monitoring	MM
8GU	April 89	90	4	1068475	215461	121.19	--	80 to 90	Monitoring	UG
8GL	April 89	150	4	1068475	215461	121.21	--	130 to 150	Monitoring	UM
8ML	June 94	355	4	1068475	215461	121.50	--	328 to 338	Monitoring	BM
9GL	April 89	155	4	1068392	214850	127.05	--	135 to 155	Monitoring	UM
10GL	April 89	132	4	1067864	215282	125.90	--	112 to 132	Monitoring	UG

See footnotes on last page.

Table 3-1
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Former Unisys Facility, Great Neck, New York

Well Designation	Date Installed	Total Depth (feet bls)	Well Diameter (inches) top/bottom	X-Coordinate NAD 83[1]	Y-Coordinate NAD 83[1]	Measuring Point Elevation NAVD 88[2] (feet relative to msl)	Land Surface Elevation (feet relative to msl)	Screened Interval (feet bls)	Notes or Well Use as per Well Completion Report	Screened Aquifer
Monitoring Wells (continued)										
11GL	May 89	140	4	1067365	214410	126.08	--	120 to 140	Monitoring	UM
11MI	May 89	250	4	1067365	214410	126.00	--	230 to 250	Monitoring	MM
12MI	May 91	253	4	1067702	215354	131.89	--	243 to 253	Monitoring	MM
12ML	May 91	393	4	1067753	215349	131.84	--	383 to 393	Monitoring	BM
13ML	April 96	275	4	1068384	218586	159.13	--	255 to 275	Monitoring	MM
14MI	April 96	250	4	1067209	217721	162.49	--	220 to 250	Monitoring	UM
15GL	August 94	170	4	1068259	213634	132.57	--	150 to 160	Monitoring	UM
15ML	August 94	340	4	1068259	213634	132.39	--	328 to 338	Monitoring	BM
16GL	April 96	222	4	1065997	218115	225.32	--	202 to 222	Monitoring	UG
16ML	August 95	326	4	1065997	218155	225.80	--	316 to 326	Monitoring	UM
17GL	August 94	170	4	1067104	216449	138.48	--	155 to 165	Monitoring	UM
17ML	August 94	428	4	1067144	216449	138.03	--	390 to 400	Monitoring	BM
18GL	September 94	170	4	1065848	216265	148.85	--	160 to 170	Monitoring	UG
18ML	September 94	345	4	1065888	216265	148.07	--	324 to 334	Monitoring	MM
19GU	January 92	99	2	--	--	135.43	--	78 to 98	Monitoring	UG
19MI	January 92	248	4	1067455	213895	135.63	--	229 to 239	Monitoring	MM
20GU	June 92	93	--	--	--	--	130 [4]	73 to 93	Monitoring	UG
21GU	January 92	98	4	1066484	214089	131.62	--	78 to 98	Monitoring	UG
22GL	September 94	168	4	1067707	216614	134.94	--	158 to 168	Monitoring	UM
22ML	August 94	340	4	1067747	216614	134.59	--	315 to 325	Monitoring	MM
23GL	August 94	150	2	1066827	215913	139.22	--	140 to 150	Monitoring	UG
23MI	June 94	215	2	1066827	215913	138.22	--	202 to 212	Monitoring	UM
23MM	January 04	321	4	1066817	215921	139.76	--	311 to 321	Monitoring	MM
24GL	May 94	150	2	1066930	215901	139.22	--	139 to 149	Monitoring	UG
24MI	May 94	220	2	1066930	215901	139.33	--	200 to 210	Monitoring	UM
25GL	May 94	170	2	1067735	215687	134.51	--	159 to 169	Monitoring	UM
25MI	May 94	220	2	1067735	215687	135.58	--	200 to 210	Monitoring	UM
26GL	May 94	184	2	1068021	215602	130.40	--	174 to 184	Monitoring	UM
26MI	May 94	240	2	1068021	215602	130.73	--	220 to 230	Monitoring	UM
27GL	June 94	180	2	1068201	215620	121.28	--	170 to 180	Monitoring	UM
27MI	June 94	230	2	1068201	215620	122.22	--	217 to 227	Monitoring	UM
28GL	June 94	150	2	1067553	215569	135.83	--	140 to 150	Monitoring	UG
28MI	June 94	250	2	1067553	215569	136.52	--	222 to 232	Monitoring	UM

See footnotes on last page.

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Monitoring Wells (continued)										
29GL	July 94	170	2	1067184	215884	142.52	--	145 to 155	Monitoring	UG
29MI	July 94	250	2	1067184	215884	142.50	--	207 to 217	Monitoring	UM
30GL	September 98	210	4	1069227	217525	139.18	136.13	190 to 210	Monitoring	UM
30MI	August 98	280	4	1069187	217525	139.33	136.14	260 to 280	Monitoring	MM
30ML	August 98	380	4	1069147	217525	139.28	136.36	360 to 380	Monitoring	BM
31GL	October 98	200	4	1067091	221080	123.43	124.17	180 to 200	Monitoring	UM
31MI	October 98	255	4	1067051	221080	123.98	124.73	235 to 255	Monitoring	MM
31ML	October 98	355	4	1067011	221080	124.17	124.87	335 to 355	Monitoring	BM
32GL	September 98	240	4	--	--	200.71[3]	201.01	220 to 240	Former Monitoring / Destroyed	UG
32MI	September 98	330	4	--	--	202.16[3]	202.39	310 to 330	Former Monitoring / Destroyed	MM
32ML	September 98	412	4	--	--	202.59[3]	202.79	392 to 412	Former Monitoring /	BM
33GL	August 98	252	4	--	--	255.21	256.55	232 to 252	Monitoring	UG
33MI	August 98	310	4	1061954	215487	255.43	256.65	290 to 310	Monitoring	UM
33ML	August 98	425	4	1061946	215497	255.38	256.66	405 to 425	Monitoring	BM
35GL	August 98	135	2	1068180	214650	126.58	126.7	115 to 135	Monitoring	UG
36GL	August 98	135	2	1066417	214774	131.62	132.49	115 to 135	Monitoring	UG
37MU	July 99	252	4	1066050	216650	178.79	180.11	242 to 252	Monitoring	UM
37MI	June 99	325	4	1066090	216690	178.76	180.09	315 to 325	Monitoring	MM
37ML	July 99	428	4	1066130	216730	178.81	180.21	418 to 428	Monitoring	BM
38MU	August 99	242	4	1066285	217260	185.61	186.84	232 to 242	Monitoring	UM
38MI	August 99	344	4	1066305	217300	187.43	188.77	334 to 344	Monitoring	MM
38ML	August 99	444	4	1066345	217300	187.17	188.87	430 to 440	Monitoring	BM
39MU	September 99	206	4	1067150	217450	157.93	158.7	196 to 206	Monitoring	UM
39MI	September 99	312	4	1067110	217450	157.53	158.1	302 to 312	Monitoring	MM
39ML	October 99	407	4	1067070	217450	158.16	159	397 to 407	Monitoring	BM
40MI	June 01	300	4	1069130	216824	130.18	129.3	250 to 300	Monitoring	MM
41MI	July 01	312	4	1069324	217043	138.61	137.8	262 to 312	Monitoring	MM
43MU	August 04	228	4	1067096	220404	130.27	131[4]	218 to 228	Monitoring	UM
43MI	August 04	330	4	1067106	220406	130.95	131[4]	310 to 330	Monitoring	MM/BM
44MU	August 04	226	4	1065499	215483	147.57	148[4]	216 to 226	Monitoring	UM
44MI	August 04	330	4	1065492	215475	147.67	148[4]	320 to 330	Monitoring	MM
45MU	February 05	289	4	1061883	218875	205.25	--	279 to 289	Monitoring	UM

See footnotes on the last page.

Table 3-1
Well Construction Details and Survey Coordinates for Wells Within a 2.5-Mile Radius (downgradient) of the Former Unisys Facility
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Well Designation	Date Installed	Total Depth (feet bls)	Well Diameter (inches) top/bottom	X-Coordinate NAD 83[1]	Y-Coordinate NAD 83[1]	Measuring Point Elevation NAVD 88[2] (feet relative to msl)	Land Surface Elevation (feet relative to msl)	Screened Interval (feet bls)	Notes or Well Use as per Well Completion Report	Screened Aquifer
Monitoring Wells (continued)										
45MI	February 05	333	4	1061890	218871	205.83	--	323 to 333	Monitoring	MM
46MI	March 06	314	4	1065537	220453	187.10	187.49	292 to 302	Monitoring	MM
46ML	March 06	400	4	1065526	220433	188.30	188.66	353 to 363	Monitoring	BM
47MI	February 08	281	4	1064284	215482	191.51	191.85	264 to 279	Monitoring	MM
47ML	February 08	390	4	1064249	215475	192.91	193.23	368 to 388	Monitoring	BM
48MI	March 08	245	4	1064248	212587	121.69	121.97	220 to 240	Monitoring	MM
48ML	March 08	345	4	1064257	212597	121.50	121.76	320 to 340	Monitoring	BM
49MI	April 08	265	4	1068621	212440	125.54	126.06	240 to 260	Monitoring	MM
49ML	April 08	353	4	1068610	212438	125.62	126.09	328 to 348	Monitoring	BM
50MI	January 2009	250	4	1068441	214145	133.46		225 to 245	Monitoring	MM
50ML	January 2009	452	4	1068439	214151	132.82		432 to 452	Monitoring	BM
51MI	December 2009	208	4	1065666	222620	142.01	140.10	183 to 203	Monitoring	UM
51ML	December 2009	347	4	1065675	222615	141.36	139.50	312 to 322 332 to 342	Monitoring	BM
EW2	July 54	260	12	--	--	--	124.57	225 to 255	Monitoring/ Former Recovery	UM/MM
EW3	March 42	256	12	1068276	215509	--	120[4]	220 to 250	Monitoring/ Former Recovery	UM/MM
N1102	March 63	166	4	1066293	219707	181.56	181.99	-- to --	Observation	UG
N3905	June 52	259	20/12	1068136	217202	126.42	126.23	214 to 254	Former Supply / Monitoring	UM
N4243	August 53	260	20/12	1068204	216994	120.39	125.58	205 to 255	Former Supply / Monitoring	UM
N4266[5]	--	396	8	--	--	57.0[3]	--		Monitoring	L
N5710	January 57	390	20/12	1067826	218753	166.19	175.89	325 to 385	Former Supply / Monitoring	MM/BM
N8585	May 69	107	4	--	--	108	--	-- to --	Observation	UG
N9948	April 82	113	4	1072440	213374	125.00	--	105 to 110	Observation	UG
N9983	June 82	55	4	--	--	--	105[4]	50 to 55	--	UG
N9982	June 82	112	4	--	--	120.00	--	104 to 109	Observation	UG
N10056	November 82	120	2	--	--	--	115[4]	110 to 120	Observation	UG
N10057	November 82	95	2	--	--	--	115[4]	85 to 95	Observation	UG
N10058	November 82	100	2	--	--	--	115[4]	90 to 100	Observation	UG
N10059	November 82	94	2	--	--	--	90[4]	84 to 94	Observation	UG

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Draft Feasibility Study, Operable Unit 2
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Monitoring Wells (continued)										
N10060	November 82	115	2	--	--	--	90[4]	105 to 115	Observation	UG
N10192[5]	January 84	352	4	--	--	23.35[3]	--	343 to 348	Observation	L
N11659	May 90	422	4	--	--	104	--	399 to 419	Observation	BM or L?
N10252	June 84	104	4	--	--	96.00	--	95 to 100	Monitoring	UG
N10290	May 85	170	4	1066012	216106	153	--	160 to 165	Observation	UG
N12082[5]	April 92	495	4	--	--	111.31[3]	--	450 to 490	Observation	L
N12154[5]	December 92	520	4	--	--	109.10[3]	--	495 to 515	Observation	L
N12247	July 93	100	4	--	--	--	120[4]	90 to 100	Observation	UG
N12248	July 93	98	4	--	--	--	115[4]	88 to 98	Observation	UG
N12450	March 94	685	4	1062197	219314	220	--	660 to 680	Monitoring	L
Q3804	June 1998	115	2				118		USGS Monitoring Well	
N12455	March 94	200	2	1062197	219314	--	220[4]	175 to 195	Monitoring	UG
RW1	September 91	196	16	--	--	144.82	139[4]	140 to 160	Former Recovery	UG
								171 to 191	Well	UM
RW2	July 91	215	8	1068149	214562	128.23	126.19	180 to 210	Monitoring/ Former Recovery	UM
ERM-MW-01		179		1066048	215549	143.71		169 to 179	Observation	UM
ERM-MW-02		142		1065840	215321	144.04		132 to 142	Observation	UM
ERM-MW-03		170		106573	215528	143.72		160 to 170	Observation	UM
ERM-MW-04		190		1066009	215931	151.88		180 to 190	Observation	UM
ERM-MW-05		220	2	1066294	217230	185.81		210 to 220	Observation	UM
ERM-MW-06		197	2	1066084	216706	178.54		187 to 197	Observation	UM
ERM-MW-07		175	2	1065879	214905	136.90		165 to 175	Observation	UM
ERM-MW-08		205	2	1065206	215683	161.03		195 to 205	Observation	UM
Municipal Supply Wells										
N1618	March 41	556	20/12	1066379	221918	82.31	83[4]	470 to 550	Inactive since 1990; estimated location of abandoned well surveyed	L?
N1802	September 42	703	20/12	1066800	213950	--	131[4]	641 to 691	Active	L?
N1958	May 45	737	20/8	--	--	--	115[4]	667 to 727	Active	L?
N3672	October 62	452	18/10	1074908	212764	--	100[4]	407 to 447	Inactive since 1981	BM or L?
N3673	September 51	433	18/10	1075158	212583	--	100[4]	388 to 428	Inactive since 1981	BM or L?
N4390	May 54	301	18/12	--	--	118[4]	120[4]	261 to 296	Active	MM
N5099	July 55	399	20/12	1064760	223420	--	170[4]	345 to 378	Active	MM/BM
								383 to 393		

See footnotes on the last page.

Table 3-1
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Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Well Designation	Date Installed	Total Depth (feet bls)	Well Diameter (inches) top/bottom	X-Coordinate NAD 83[1]	Y-Coordinate NAD 83[1]	Measuring Point Elevation NAVD 88[2] (feet relative to msl)	Land Surface Elevation (feet relative to msl)	Screened Interval (feet bls)	Notes or Well Use as per Well Completion Report	Screened Aquifer
Municipal Supply Wells (continued)										
N5603	June 56	420	18/8	1074873	214731	--	110[4]	362 to 413	Active	BM or L?
N7445	April 64	453	18/12	1070539	214112	--	120[4]	388 to 448	Active	BM
N7512	June 65	380	20/12	1071847	216287	--	120[4]	325 to 375	Active	BM
N9308[5]		--	--	--	--	--	--		Active	L
N10612	March 88	455	20/12	--	--	--	170[4]	375 to 405	Active	BM
								420 to 450		BM
N12802	--	567	18/12	1066314	221835	85.77	80[4]	476 to 562	Replaces N1618	L?
N12999	--	417	20/12	1068371	221788	--	200[4]	294 to 304	Active	UM
								312 to 322		MM
								392 to 412		MM
N13000	--	353	20/12	1068380	221596	--	220[4]	308 to 348	Active	UM/MM
Non-Municipal Diffusion Wells										
DW5	July 42	267	12	--	--	--	128[4]	210 to 260	Abandoned in 2002	UM/MM
DW6	September 42	259	12	--	--	--	132[4]	209 to 259	Abandoned in 2002	UM/MM
DW7	June 54	245	12	--	--	--	130[4]	199 to 239	Abandoned in 2002	UM/MM
DW8	June 42	195	12	--	--	--	128[4]	140 to 190	Abandoned in 2002	UG/UM
DW9	July 01	306	8	1069103	216860	120.26[6]	124[4]	252 to 290	Diffusion from EW-1,	MM
								294 to 301	RW-1RS and RW-1RD	
DW10	July 01	317	8	1068571	218243	136.02[6]	136[4]	262 to 317	Diffusion from EW-1,	MM
									RW-1RS and RW-1RD	
DW11	June 02	416	10	1069213	216970	129.21[6]	129[4]	275 to 411	Diffusion from EW-1,	MM/BM
DW12	August 02	401	12/10	1069434	217153	135.92[6]	136[4]	308 to 396	Diffusion from EW-1,	MM/BM
									RW-1RS and RW-1RD	
DW13	October 08	385	12/10	--	--	121.54	126	250 320	Diffusion from EW-1,	MM/BM
								340 380	RW-1RS and RW-1RD	
DW100	January 04	424	12/10	--	--	131.1	133[4]	299 to 331	Diffusion from RW100	MM/BM
								415 to 419		
DW101	November 03	413	12/10	1068628	217988	126.8	128[4]	333 to 383	Diffusion from RW100	BM
								393 to 408		
DW102	February 04	418	12/10	1068573	217805	126.4	127[4]	365 to 413	Diffusion from RW100	BM
N2220D	December 46	77	12	--	--	--	125[4]	62 to 77	Diffusion from N2219	UG
N3819D	November 54	74	6	--	--	--	120[4]	52 to 74	Diffusion from N3736	UG
N4203D	October 53	40	4	--	--	115[4]	125[4]	30 to 40	Diffusion from N4202	UG

See footnotes on the last page.

Table 3-1
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Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

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Non-Municipal Diffusion Wells (continued)										
N6890D	June 60	57	8	--	--	--	110[4]	27 to 57	Diffusion from N6865	UG
N6960D	August 60	59	12/8	--	--	--	110[4]	43 to 59	Diffusion from N6918	UG
N6961D	August 60	58	12/8	--	--	--	110[4]	42 to 58	Diffusion from N6918	UG
N7762D	November 64	98	6	1066043	215544	144.00	150[4]	68 to 98	Diffusion from N7560 (replaced by N9714D)	UG
N8372D	October 67	348	8	--	--	--	120[4]	286 to 346	Diffusion from N8358	MM/BM
N8373D	May 68	350	8	--	--	--	120[4]	290 to 350	Diffusion from N8358	MM/BM
N8375D	September 67	545	8	1065542	224443	98.33	110[4]	498 to 545	Diffusion from N8255	L
N8565D	June 70	260	8	--	--	--	130[4]	200 to 260	Diffusion from N8499/N8564	UM/MM
N8566D	June 70	250	8	--	--	--	130[4]	190 to 250	Diffusion from N8499/N8564	UM/MM
N8567D	June 70	250	8	--	--	--	130[4]	190 to 250	Diffusion from N8499/N8564	UM/MM
N8568D	June 70	241	8	--	--	--	130[4]	201 to 241	Diffusion from N8499/N8564	UM
N8787D	May 71	101	6	--	--	--	150[4]	71 to 101	Supplemental diffuser (from N7560)	UG
N9714D	June 80	99	6	1066042	215551	144.60	140[4]	59 to 99	--	UG
N9877D	March 82	293	8/6	--	--	--	120[4]	250 to 290	Air Conditioning	MM
N11080D	April 88	318	6	--	--	--	120[4]	252 to 312	Diffusion from N10421/N10422	MM
N11081D	March 88	318	6	--	--	--	120[4]	263 to 313	Diffusion from N10421/N10422	MM
N12668D	January 96	65	8	--	--	--	110[4]	45 to 65	Diffusion from N6865 (replaces N6890D)	UG
Q2429D	May 64	90	6	--	--	--	100[4]	75 to 90	Diffusion from Q2428	UG
Q3024D	September 71	182	10	1065272	214490	136.64	137.51	141 to 181	Diffusion from Q3003	UG/UM
Q3025D	September 71	217	10/8	1065312	214466	135.96	137.21	171 to 212	Diffusion from Q3003	UM
Non-Municipal Irrigation Wells										
N2169	March 47	239	10	1065517	215619	--	80[4]	221 to 239	Irrigation	MM
N2576	July 75	200	10	1065517	215619	133[4]	131[4]	178 to 198	Irrigation	UM
N3927	July 52	95	8	--	--	120[4]	120[4]	84 to 95	Irrigation	UG
N5535	November 56	390	16/12	1069230	220000	--	250[4]	330 to 350 370 to 390	Irrigation	UM MM
N7053	June 61	286	12	--	--	--	200[4]	246 to 286	Irrigation	UM
N8038	June 66	295	12	1063200	217720	--	210[4]	272 to 295	Irrigation	UM
N8055	June 66	199	4	--	--	--	180[4]	191 to 199	Irrigation	UG
N9080	August 75	111	4	--	--	--	110[4]	105 to 110	Irrigation	UG
N11435	April 89	105	4	--	--	101[4]	105[4]	100 to 105	Irrigation	UG
N13221	June 02	281	16	1064322	215789	220[4]	220[4]	195 to 235	Irrigation	UG

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Table 3-1
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Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

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Non-Municipal Irrigation Wells (continued)										
aka Main								271 to 281		UM
N13266	June 02	240	6	1064236	215819	220[4]	220[4]	200 to 240	Irrigation	UG
aka Jockey										
Q3241	April 89	114	4	--	--	111[4]	115[4]	109 to 114	Irrigation	UG
Q3244	June 89	106	4	--	--	99[4]	105[4]	101 to 106	Irrigation	UG
Q3246	June 89	101	4	--	--	108[4]	110[4]	96 to 101	Irrigation	UG
Q3247	June 89	110	4	1066861	212468	122[4]	125[4]	105 to 110	Irrigation	UG
Q3908	July 2001	385							Irrigation (Douglaston Golf Course)	
Non-Municipal Supply Wells										
Glen Oaks Pool/2604	--	210[4]	--	1062339	214418	--	150[4]	-- to --	--	UG?
N2219	November 46	110	8	--	--	111[4]	125[4]	88 to 110	Air Conditioning	UG
N2584	February 48	48	6	--	--	--	100[4]	36 to 47	Washing Gravel	UG
N3736	September 51	80	6	--	--	111[4]	120[4]	74 to 80	Cooling	UG
N3756	September 51	100	8	--	--	116[4]	125[4]	89 to 100	Cooling (Abandoned)	UG
N3954	August 52	149	8	--	--	--	40[4]	127 to 149	Cooling	UM
N4202	October 53	82	4	--	--	--	125[4]	72 to 82	Air Conditioning	UG
N6322	September 57	96	6/4	--	--	--	140[4]	91 to 96	Air Conditioning	UG
N6835	February 60	78	10	--	--	--	100[4]	-- to --	Cooling (Abandoned)	UG
N6865	May 60	301	8/6	--	--	--	110[4]	280 to 301	Cooling	MM
N6918	July 60	303	10/8	--	--	--	110[4]	283 to 303	Cooling	MM
N7113	July 61	125	8/6	--	--	--	40[4]	104 to 125	Cooling	UM
N7376	November 62	65	4	--	--	--	100[4]	59 to 65	Transit Mix	UG
N7399	January 63	200	6/4	--	--	--	120[4]	189 to 199	Air Conditioning	MM
N7560	August 64	242	8/6	1065848	215706	139.99	150[4]	221 to 241	Cooling	UM
N7784	February 65	105	4	--	--	--	115[4]	99 to 105	Cooling	UG
N8211	February 67	225	10/6	--	--	--	120[4]	194 to 209	Process	UM
N8255	--	--	--	1065570	224154	97.91	--	-- to --	--	--
N8358	September 67	397	12/10	--	--	--	120[4]	355 to 397	Air Conditioning	BM
N8456	November 68	600	10/8	1065589	224143	95.11	120[4]	559 to 600	Air Conditioning	L
N8499	October 68	270	16/12	1069776	217178	--	150[4]	160 to 180	Air Conditioning (West)	UG/UM
								230 to 270		UM/MM
N8564	--	323	18/12	1070099	217222	--	150[4]	170 to 190	Air Conditioning (East)	UG/UM
								280 to 320		MM

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Non-Municipal Supply Wells (continued)										
N13436				1069900	217203	--	150 [4]		Air Conditioning (Center)	
N10442	June 85	155	4	--	--	--	170 [4]	150 to 155	To fill pond	UG
N11048	September 88	330	10	--	--	--	120 [4]	287 to 327	Cooling	MM
Q1908	October 52	180	12	--	--	116 [4]	130 [4]	140 to 180	Cooling; Inaccessible	UG/UM
Q1909	October 52	245	12	--	--	122 [4]	132 [4]	205 to 245	A/C; Inaccessible	UM
Q1914	Dec 1952	253							General use (Creedmor)	
Q2428	April 64	103	6	--	--	--	100 [4]	93 to 103	Cooling and A/C	UG
Q3003	June 72	320	16/12	--	--	--	130 [4]	279 to 319	A/C; Inaccessible	MM
Q4649	--	--	--	--	--	--	--	-- to --	No such well/permit exists	
Use Unknown										
N6406	January 58	171	4	--	--	--	170 [4]	166 to 171	--	UG
N9687	--	--	--	--	--	--	80 [4]	-- to --	--	--
N11460	May 1989	106	4	--	--	102 [4]	105 [4]	101 to 106	--	UG
Q3190	April 86	108	4	--	--	--	110 [4]	104 to 108	--	UG

Notes:

bls	Below land surface.
msl	Mean sea level.
--	Information not available.
(1)	X- and Y-coordinates are in NAD 83 unless otherwise indicated.
(2)	Measuring point elevations are referenced to Nassau County NAVD 88 unless otherwise indicated; land surface elevations are referenced to Nassau County NGVD 29.
(3)	Z-coordinate is referenced to Nassau County NGVD 29.
(4)	Estimated.
(5)	Monitoring wells N4266, N10192, N12082, and N12154; and municipal supply well N9308 are all located outside the 2-mile radius.
(6)	Measuring point for OU-1 diffusion wells installed by the Former Unisys Facility are the top of access tubing, not well seal.
BM	Basal portion of the Magothy. Screen interval located from approximately -204 to -270 feet relative to msl.
L	Lloyd aquifer. Screen interval located approximately deeper than -270 feet relative to msl and below the Raritan.
MM	Middle portion of the Magothy. Screen interval located from approximately -113 to -204 feet relative to msl.
NAD 83	North American Datum of 1983.
NAVD 88	North American Vertical Datum of 1988.
NGVD 29	National Geodetic Vertical Datum of 1929.
UG	Upper Glacial. Screen interval located from approximately land surface to -24 feet relative to msl.
UM	Upper portion of the Magothy. Screen interval located from approximately -24 to -113 feet relative to msl.

Table 3-2
Vertical Hydraulic Gradients at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Well Pairing Identification	Measuring Point Elevation (feet above msl)	Well Screen Midpoint Elevation (ft msl)	March 29, 2006 Water Level Elevation (ft msl)	March 29, 2006 Vertical Gradient (ft/ft)*10^{-3}	January 12-13, 2010 Water Level Elevation (ft msl)	January 12-13, 2010 Vertical Gradient (ft/ft)*10^{-3}
Upper Glacial-Upper Magothy						
1GU	141.35	UG			--	
1GL	141.44	7	43.19	-0.19	46.88	5.09
1MI	141.71	-101	43.21		46.33	
4GL	141.13	5	43.02	1.80	45.85	3.40
4MI	141.36	-95	42.84		45.51	
7GL	148.55	10	42.15	4.57	44.93	2.48
7MU	149.53	-95	41.67		44.67	
8GU	121.19	35	47.26	23.09	50.91	27.82
8GL	121.21	-20	45.99		49.38	
16GL	225.32	15	40.25	2.66	42.34	-3.76
16ML	225.80	-94	39.96		42.75	
23GL	139.22	-5	41.72	19.21	44.57	19.84
23MI	138.22	-68	40.51		43.32	
24GL	139.22	-4	41.97	8.85	44.89	9.34
24MI	139.33	-65	41.43		44.32	
28GL	135.83	-9	43.24	-4.94	46.53	-1.60
28MI	136.52	-90	43.64		46.66	
29GL	142.52	-7	42.21	3.55	45.38	5.48
29MI	142.50	-69	41.99		45.04	
33GL	255.21	15	39.16	52.24	42.71	70.17
33MI	255.43	-43	36.13		38.64	
Upper Magothy-Middle Magothy						
1MI	141.71	-101	43.21	-11.51	46.33	-12.67
1M1/L	141.74	-187	44.20		47.42	
11GL	126.08	-1	45.05	2.36	48.06	2.18
11MI	126.00	-111	44.79		47.82	
22GL	134.94	-27	43.70	0.06	46.98	--
22ML	134.59	-185	43.69		Not taken	
30GL	139.18	-64	44.43	-9.43	50.04	-19.29
30MI	139.33	-134	45.09		51.39	
31GL	123.43	-66	33.18	6.48	38.46	8.15
31MI	123.98	-120	32.83		38.02	
37MU	178.79	-67	41.61	0.27	44.14	0.55
37MI	178.76	-140	41.59		44.10	
39MU	157.93	-42	42.02	0.47	40.77	4.30
39MI	157.53	-149	41.97		40.31	
43MU	130.27	-73	33.10	-1.55	37.81	-5.46
43MI	130.95	-170	33.25		38.34	
44MU	147.57	-70	42.27	1.35	45.07	1.54
44MI	147.67	-174	42.13		44.91	

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Table 3-2
Vertical Hydraulic Gradients at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Well Pairing Identification	Measuring Point Elevation (feet above msl)	Well Screen Midpoint Elevation (feet msl)	March 29, 2006 Water Level Elevation (feet msl)	March 29, 2006 Vertical Gradient (ft/ft)*10^{-3}	January 12-13, 2010 Water Level Elevation (feet msl)	January 12-13, 2010 Vertical Gradient (ft/ft)*10^{-3}
Middle Magothy-Basal Magothy						
1MI/L	141.74	-187	44.20	3.17	47.42	2.54
1ML	141.96	-250	44.00		47.26	
5MI	129.56	-114.5	45.04	-5.20	50.18	23.70
5ML	128.26	-201	45.49		48.13	
12MI	131.89	-114	44.48	-1.50	47.62	-0.71
12ML	131.84	-254	44.69		47.72	
30MI	139.33	-134	45.09	0.70	51.39	4.00
30ML	139.28	-234	45.02		50.99	
37MI	178.76	-140	41.59	0.39	44.10	-0.49
37ML	178.81	-243	41.55		44.15	
39MI	157.53	-149	41.97	0.43	40.31	-44.79
39ML	158.16	-243	41.93		44.52	

Notes:

msl Mean sea level.
Vertical hydraulic gradient calculated as follows:
1 shallower well.
2 deeper well.

$$\frac{(\text{Water Level Elevation}_1 - \text{Water Level Elevation}_2)}{(\text{Screen Midpoint Elevation}_1 - \text{Screen Midpoint Elevation}_2)}$$

A positive "+" value indicates a downward hydraulic gradient.
A negative "-" value indicates an upward hydraulic gradient.

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	1GL 04/27/06 212764-005	1GL 06/01/09 220-9206-9	1GU 04/27/06 212764-004	1GU 03/03/10 220-11577-9
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**1.0**	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 UJ	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**86**	**0.52 J**	1.0 U	**0.21 J**
1,2-Dichloroethene (trans)	5	**0.60 J**	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	2.0 U
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	1.0 U
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	1.0 UB
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	1.0 UJ
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**6.0**	**0.45 J**	2.0 U	**0.39 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**16**	**1.2**	**1.0**	**1.7**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**110 J**	**3.7 J**	**1.0**	**3.7 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	1MI 04/28/06 212764-009	1MI 06/01/09 220-9206-10	1MI 06/22/09 220-9451-6	1MI-L 04/27/06 212764-003
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**1.0**	**1.8**	**2.5**	**15**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	**0.18 J**	**0.23 J**	1.0 U
1,1-Dichloroethene	5	1.0 U	**0.86 J**	**1.2**	**1.0**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**20**	**11**	**12**	**140**
1,2-Dichloroethene (trans)	5	1.0 U	**0.16 J**	**0.17 J**	**0.90 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	NA	1.0 U
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 UBJ	5.0 U
Benzene	1	1.0 U	NA	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**1.4**	**2.2**	**3.0**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	**0.12 J**	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 UB	1.0 UB	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	**0.23 J**	**0.20 J**	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**5.0**	**5.9**	**8.2**	**43**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**4.0**	**7.0**	**8.4**	**52**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	1.0 U	3.0 U
Total VOCs	- -	**30**	**31 J**	**37 J**	**250 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	1MI-L 06/01/09 220-9206-7	1ML 04/28/06 212764-008	1ML 06/01/09 220-9206-8	2GL 05/16/06 212899-001
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**10**	**10**	**9.8**	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**0.14 J**	1.0 U	**0.26 J**	1.0 U
1,1-Dichloroethene	5	**0.64 J**	**0.70 J**	**0.94 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 UJ	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**32**	**140**	**84**	**1.0**
1,2-Dichloroethene (trans)	5	**0.56 J**	**1.0**	**0.87 J**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**1.2**	**1.0**	**2.5**	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.15 J**	1.0 U	**0.54 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UB	1.0 U	1.0 UB	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	**0.31 J**	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**23**	**20**	**26**	**2.0 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**16**	**63**	**39**	**2.0**
Trichlorofluoromethane (Freon 11)	- -	**0.11 J**	1.0 U	**0.25 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**85 J**	**240 J**	**170 J**	**5.0 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	2GL 12/18/09 220-11147-6	2MI 05/16/06 212874-019	2MI 12/22/09 220-11147-13	2ML 05/16/06 212874-018
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.11 J**	**9.0**	**0.25 J**	**0.60 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**0.25 J**	**24**	**1.3**	**14**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB	**6.0**
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UB	1.0 U	**0.11 J**	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**8.7**	**8.0**	**14**	**1.0 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**1.2**	**11**	**1.4**	**3.0**
Trichlorofluoromethane (Freon 11)	- -	**0.15 J**	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**10 J**	**52**	**17 J**	**25 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	2ML 12/15/09 220-11092-12	2MU 05/16/06 212874-020	2MU 12/18/09 220-11147-7	3GL 04/21/06 212727-004
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.64 J**	**4.0**	**1.7**	**1.0**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.14 J**	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**6.4**	**100**	**39**	**24**
1,2-Dichloroethene (trans)	5	**0.12 J**	**0.50 J**	**0.43 J**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	**12 J**	5.0 U	5.0 UB	5.0 UJ
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.2 UB	1.0 U
Chloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	**0.11 J**	1.0 U
Chloromethane (Methyl chloride)	5	**0.24 J**	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	**0.16 J**	**0.50 J**
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**2.1**	**15**	**12**	**5.0**
Toluene	5	**0.19 J**	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**2.4**	**20**	**10**	**5.0**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	**0.12 J**	1.0 U
Xylenes (total)	5	**0.14 J**	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**24 J**	**140 J**	**64 J**	**36 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	3GL 12/14/09 220-11092-3	3ML 04/21/06 212727-003	3ML 12/14/09 220-11092-4	4GL 05/05/06 212806-009
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.38 J**	**16**	**17**	**2.0**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	**0.24 J**	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	**0.45 J**	1.0 U
1,1-Dichloroethene	5	1.0 U	**0.60 J**	**0.70 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	**0.76 J**	1.0 U
1,2-Dichloroethene (cis)	5	**5.0**	**340 D**	**290 D**	**71**
1,2-Dichloroethene (trans)	5	1.0 U	**4.0**	**2.8**	**0.40 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	**0.25 J**	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	**0.18 J**	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 UJ	5.0 UBJ	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 UB	1.0 U	1.0 UB	**58**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	**1.0 J**	**0.87 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	**0.30 J**	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	**2.0**	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**1.6**	**35**	**46**	**14**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**1.4**	**110**	**95**	**15**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	**0.60 J**	**0.39 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	**0.17 J**	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**8.4 J**	**510 J**	**460 J**	**160 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	4GL 06/02/09 220-9206-14	4GL 06/23/09 220-9451-10	4MI 05/05/06 212806-010	4MI 06/02/09 220-9206-13
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.39 J**	**0.23 J**	1.0 U	**7.9**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	**0.18 J**
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	**0.27 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 UJ	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**6.2**	**2.8**	**5.0**	**110**
1,2-Dichloroethene (trans)	5	1.0 U	**0.10 J**	1.0 U	**1.8**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UB	5.0 U	5.0 UB
Benzene	1	NA	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**6.0**	**2.8**	**2.0**	**0.75 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	**0.21 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UB	1.0 UB	1.0 U	1.0 UB
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**4.2**	**3.2**	**2.0 J**	**15**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**2.3**	**1.5**	**0.80 J**	**18**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	**0.11 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**20 J**	**12 J**	**9.8 J**	**160 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	5GL 05/09/06 212806-019	5GL 12/15/09 220-11092-10	5GU 05/12/06 212874-009	5GU 12/22/09 220-11147-14
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	**0.12 J**	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	**0.92 J**	1.0 U	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UBJ	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 UJ	**1.3**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 UJ	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 UJ	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	**0.90 J**	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	**0.52 J**	2.0 U	**0.48 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**0.70 J**	**0.51 J**	**0.40 J**	**0.33 J**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**1.6 J**	**2.1 J**	**0.40 J**	**2.1 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	5MI 05/09/06 212806-020	5MI 12/15/09 220-11092-9	5ML 05/09/06 212806-022	5ML 12/15/09 220-11092-8
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**47**	**1.5**	**18**	**4.8**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	**0.12 J**
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**1.0**	1.0 U	**0.80 J**	**0.23 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 UJ	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	**0.37 J**
1,2-Dichloroethene (cis)	5	**930 D**	**21**	**350 D**	**88**
1,2-Dichloroethene (trans)	5	**33**	**0.23 J**	**2.0**	**0.92 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UBJ	5.0 U	5.0 UBJ
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**2.0**	1.0 U	1.0 U	1.0 UB
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**2.0**	1.0 U	**1.0**	**0.61 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	**0.11 J**
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	**0.11 J**
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**160**	**5.9**	**52**	**12**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**230 D**	**7.6**	**140**	**41**
Trichlorofluoromethane (Freon 11)	- -	**0.50 J**	1.0 U	**0.80 J**	**0.56 J**
Vinyl chloride	2	1.0 U	1.0 U	**1.0**	**0.77 J**
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**1,400 J**	**36 J**	**570 J**	**150 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	6GL 05/11/06 212874-004	6GL 12/22/09 220-11147-18	6MI 05/11/06 212874-003	6MI 12/22/09 220-11147-17
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	**0.13 J**	**5.0**	**2.3**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	**2.0**	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	**3.0 J**	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 UJ	1.0 U	1.0 UJ	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	1.0 U	**55**	**36**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	**1.0**	**0.51 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 UJ	NA	3.0 UJ	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UJ	5.0 UB	5.0 UJ	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.0 UB
Chloroethane	5	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 UJ	NA	1.0 UJ	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UJ	1.0 U	1.0 UJ	**0.11 J**
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 UJ	NA	1.0 UJ	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	**0.51 J**	**11**	**7.4**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U	**0.41 J**	**12**	**7.7**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	5.0 U	**1.1 J**	**89 J**	**54 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	7GL 05/04/06 212806-005	7GL 06/02/09 220-9206-19	7ML 05/05/06 212806-011	7ML 06/02/09 220-9206-15
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**2.0**	**0.69 J**	**20**	**13**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	**0.13 J**
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	**0.60 J**
1,1-Dichloroethene	5	1.0 U	1.0 U	**1.0**	**0.77 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 UJ	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	**0.68 J**
1,2-Dichloroethene (cis)	5	**21**	**26**	**530 D**	**290 D**
1,2-Dichloroethene (trans)	5	1.0 U	**0.20 J**	**4.0**	**3.7**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	**0.13 J**
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**16**	**27**	**4.0**	**3.2**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	**0.80 J**	**0.62 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 UB	1.0 U	1.0 UB
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	**0.33 J**
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**4.0**	**3.5**	**65**	**60**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**7.0**	**4.5**	**94**	**57**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	**0.25 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	**0.41 J**
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**50**	**64 J**	**720 J**	**430 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	7MU 05/04/06 212806-006	7MU 12/22/09 220-11147-12	8GL 04/24/06 212727-008	8GL 06/02/09 220-9206-18
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**4.0**	**2.7**	**5.0**	**5.2**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	**0.13 J**	1.0 U	**0.55 J**
1,1-Dichloroethene	5	1.0 U	1.0 U	**2.0**	**2.9**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**110**	**50**	**35**	**29**
1,2-Dichloroethene (trans)	5	**4.0**	**1.4**	**1.0**	**0.51 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 UJ	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**4.0**	**8.0**	**3.0**	**4.2**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	**0.14 J**	1.0 U	**0.29 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	**0.13 J**	1.0 U	1.0 UB
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	**0.26 J**	1.0 U	**0.16 J**
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**18**	**8.0**	**18**	**18**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**21**	**8.2**	**26**	**21**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	**4.0**	**0.12 J**
Vinyl chloride	2	1.0 U	**0.10 J**	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**160**	**79 J**	**94**	**83 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	8GU 04/24/06 212727-009	8GU 06/02/09 220-9206-17	8ML 04/24/06 212727-007	8ML 06/02/09 220-9206-16
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	**3.0**	**1.5**	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**7.0**	**4.4**	**5.0**	**7.2**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	**0.14 J**	1.0 U	**0.36 J**
1,1-Dichloroethene	5	**7.0**	**3.9**	**0.80 J**	**1.4**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	**1.2**	**44**	**45**
1,2-Dichloroethene (trans)	5	**6.0**	**2.9**	**0.50 J**	**0.72 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UJ	5.0 UB	5.0 UJ	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**0.29 J**	**3.0**	**3.1**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	**0.40 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 UB
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	**0.17 J**	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**2.0 J**	**1.9**	**12**	**20**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**0.70 J**	**1.7**	**26**	**28**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	**0.16 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**26 J**	**19 J**	**91 J**	**110 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	9GL 05/17/06 212899-008	9GL 12/29/09 220-11193-11	10GL 05/11/06 212874-006	10GL 12/18/09 220-11147-5
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	**2.1**
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.80 J**	**2.9**	**9.0**	**4.7**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	**0.37 J**	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	**1.4**	**3.0**	**6.0**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 UJ	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichloroethene (cis)	5	**4.0**	**14**	**2.0**	**0.35 J**
1,2-Dichloroethene (trans)	5	1.0 U	**0.21 J**	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 UJ	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UJ	5.0 UB	5.0 UJ	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**2.9**	1.0 U	1.0 UB
Chloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 UJ	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 UJ	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	**0.28 J**	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**3.0**	**9.1**	**3.0**	**1.7**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**4.0**	**14**	**0.70 J**	**0.80 J**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**12 J**	**45 J**	**18 J**	**16 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	11GL 05/17/06 212899-006	11GL 12/16/09 220-11140-6	11MI 05/17/06 212899-005	11MI 12/16/09 220-11140-5
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**25**	**21**	**6.0**	**15 [16]**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	**0.20 J [1.0 U]**
1,1-Dichloroethane	5	1.0 U	**0.29 J**	1.0 U	**0.65 J [0.65 J]**
1,1-Dichloroethene	5	1.0 U	**0.80 J**	1.0 U	**0.88 J [0.98 J]**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 UJ	3.0 U [3.0 U]
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	**0.66 J [0.62 J]**
1,2-Dichloroethene (cis)	5	**180**	**210 D**	**140**	**370 D [370 D]**
1,2-Dichloroethene (trans)	5	**4.0**	**0.73 J**	**11**	**3.1 [2.9]**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UJ	5.0 UB	5.0 UJ	5.0 UB [5.0 UB]
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 UB	**1.0**	**4.0 [4.1]**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloroform	7	1.0 U	**0.31 J**	1.0 U	**0.68 J [0.69 J]**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	**0.28 J [0.35 J]**
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	**0.31 J**	1.0 U	**0.22 J [0.12 J]**
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB [2.0 UB]
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Tetrachloroethene (PCE)	5	**46**	**57**	**19**	**68 [68]**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Trichloroethene (TCE)	5	**26**	**24**	**27**	**69 [70]**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	**0.25 J [0.22 J]**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	**0.29 J [0.29 J]**
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U [1.0 U]
Total VOCs	- -	**280**	**310 J**	**200**	**530 J [530 J]**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	12MI 05/01/06 212764-014	12MI 12/17/09 220-11140-12	12ML 04/26/06 212727-020	12ML 12/16/09 220-11140-3
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	**3.0**	**1.6**	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**10**	**4.7**	**6.0**	**5.9**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	**0.17 J**
1,1-Dichloroethene	5	**6.0**	**4.1**	1.0 U	**0.38 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**3.0**	**1.6**	**62**	**57**
1,2-Dichloroethene (trans)	5	**5.0**	1.0 U	1.0 U	**0.88 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UBJ
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.7 UB
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	**0.70 J**	**1.0**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**3.0**	**2.1**	**12**	**16**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**2.0**	**1.2**	**25**	**23**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	**0.30 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**32**	**15**	**110 J**	**100 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	13ML 05/24/06 212940-017	14MI 06/27/06 213191-005	14MI 06/19/09 220-9430-3	15GL 05/23/06 212940-009
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	**0.40 J**	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	**8.0**	**19 J**	**7.0**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	**0.15 J**	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	**0.56 J**	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	**3.3 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	**0.43 J**	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	**250 A**	**190 J**	**42**
1,2-Dichloroethene (trans)	5	1.0 U	**2.0**	1.0 UB	**0.40 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	**0.13 J**	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	3.0 UJ	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 U	5.0 U	5.0 UB	5.0 U
Benzene	1	1.0 U	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**15**	**25 J**	**0.50 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	**0.64 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	**1.2 J**	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 U	2.0 UBJ	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	**34**	**60 J**	**10**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U	**120**	**80 J**	**11**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 UB	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	5.0 U	**430**	**380 J**	**71 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	15GL 12/15/09 220-11092-6	15ML 05/23/06 212940-010	15ML 12/15/09 220-11092-7	16GL 05/22/06 212940-005
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.28 J**	1.0 U	**0.61 J**	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	**0.13 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**2.6**	1.0 U	**9.0**	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	**0.13 J**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UBJ	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 UB	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	**0.21 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	**0.14 J**	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	**0.25 J**	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	**0.29 J**	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**1.0**	**0.70 J**	**1.6**	2.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**0.70 J**	**0.60 J**	**2.6**	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**4.9 J**	**1.3 J**	**15 J**	5.0 U

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	16GL 06/08/09 220-9279-9	16ML 05/16/06 212899-002	16ML 06/26/09 220-9493-3	17GL 05/24/06 212940-015
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	**37**	**18 J**	**12**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	**0.29 J**	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	**0.61 J**	1.0 U
1,1-Dichloroethene	5	1.0 U	**2.0**	**1.2**	**0.90 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	**1.0**	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	**770 D**	**330 D**	**360 D**
1,2-Dichloroethene (trans)	5	1.0 U	**4.0**	**4.7**	**22**
1,2-Dichloropropane	1	1.0 U	1.0 U	**0.29 J**	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**6.0**	**25 J**	**3.0**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	**2.0**	**1.4**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 UBJ	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 U	2.0 UBJ	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	1.0 U	**96**	**74**	**68**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U	**190**	**120**	**58**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	**0.90 J**	**1.1 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 UJ	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**1.1 J**	**1,100 J**	**580 J**	**520 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	17GL 06/03/09 220-9271-5	17ML 05/24/06 212940-016	17ML 06/03/09 220-9271-3	18GL 05/18/06 212899-013
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**2.5**	**6.0**	**2.4 [2.4]**	**5.0**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1-Dichloroethane	5	**0.24 J**	1.0 U	**0.17 J [0.17 J]**	1.0 U
1,1-Dichloroethene	5	**0.90 J**	1.0 U	**0.57 J [0.56 J]**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U [3.0 U]	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethene (cis)	5	**66**	**120**	**47 [47]**	**140**
1,2-Dichloroethene (trans)	5	**0.66 J**	**0.50 J**	**0.41 J [0.41 J]**	**1.0**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB [5.0 UB]	5.0 UJ
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 UJ [1.0 UJ]	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**2.3**	**0.70 J**	**1.4 [1.3]**	**150**
Chloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloroform	7	1.0 UB	1.0 U	1.0 UB [1.0 UB]	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 UJ
Cyclohexane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	**0.13 J [1.0 U]**	1.0 UJ
Ethylbenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB [2.0 UB]	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Tetrachloroethene (PCE)	5	**16**	**10**	**4.8 [4.7]**	**28**
Toluene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Trichloroethene (TCE)	5	**20**	**38**	**19 [19]**	**30**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Vinyl chloride	2	**0.32 J**	1.0 U	**0.12 J [0.11 J]**	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U [1.0 U]	3.0 U
Total VOCs	- -	**110 J**	**180 J**	**78 J [77 J]**	**350**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	18GL 06/03/09 220-9271-6	18ML 05/18/06 212899-012	18ML 06/03/09 220-9271-7	19GU 05/12/06 212874-011
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**3.4**	**30**	**8.1**	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	**0.12 J**	1.0 U
1,1-Dichloroethane	5	**0.21 J**	1.0 U	**0.45 J**	1.0 U
1,1-Dichloroethene	5	**0.32 J**	**2.0**	**0.85 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	**1.0 J**	**0.43 J**	1.0 UJ
1,2-Dichloroethene (cis)	5	**110**	**700 D**	**270 D**	1.0 U
1,2-Dichloroethene (trans)	5	**1.0**	**5.0**	**1.6**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	**0.13 J**	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 UJ	5.0 UB	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**99**	**6.0**	**3.1**	1.0 UJ
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 UB	**1.0**	1.0 UB	1.0 UJ
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 UJ	NA	1.0 UJ
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 UJ	**0.14 J**	1.0 UJ
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 UJ
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	**2.0**	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	**0.20 J**	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**21**	**65**	**19**	**0.40 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**22**	**130**	**40**	1.0 U
Trichlorofluoromethane (Freon 11)	- -	**0.11 J**	**0.60 J**	**0.14 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**260 J**	**940 J**	**350 J**	**0.40 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	19GU 12/28/09 220-11193-5	19MI 05/12/06 212874-010	19MI 12/28/09 220-11193-4	20GU 07/20/06 213336-001
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	**22**	**17**	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	**0.34 J**	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	**0.64 J**	1.0 U
1,1-Dichloroethene	5	1.0 U	**0.70 J**	**0.78 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 UJ	**0.94 J**	1.0 U
1,2-Dichloroethene (cis)	5	**0.58 J**	**400 D**	**450 D**	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U	**10**	**6.4**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	**0.35 J**	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UBJ	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 UB	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**2.0 J**	**1.9**	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.78 J**	**1.0 J**	**1.2**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 UJ	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 UJ	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**0.65 J**	**71**	**84**	2.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**0.27 J**	**120**	**110**	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	**0.80 J**	**0.43 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**2.3 J**	**630 J**	**670 J**	5.0 U

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	21GU 05/17/06 212899-007	21GU 01/04/10 220-11239-2	22GL 05/18/06 212899-015	22GL 01/04/10 220-11239-1
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	**7.0**	**5.2**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	**0.57 J**
1,1-Dichloroethene	5	1.0 U	1.0 U	**3.0**	**2.4**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**0.50 J**	**0.42 J**	**44**	**36**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	**0.54 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UJ	5.0 UB	5.0 UJ	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	**7.0**	**6.0**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	**0.28 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 UJ	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	**0.48 J**	**24**	**21**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U	**0.73 J**	**35**	**28**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**0.50 J**	**2.8 J**	**120**	**100 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	22ML 05/18/06 212899-014	23GL 05/09/06 212806-021	23GL 12/16/09 220-11140-8	23MI 05/08/06 212806-015
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**3.0**	**2.0 [5.0]**	**0.49 J**	**20**
1,1,2-Trichloroethane	1	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,1-Dichloroethene	5	**1.0**	1.0 U [1.0 U]	1.0 U	5.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ [1.0 UJ]	1.0 U	5.0 UJ
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 UJ [3.0 UJ]	3.0 U	15 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,2-Dichloroethene (cis)	5	**29**	**19 [23]**	**0.83 J**	**590 D**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U [1.0 U]	1.0 U	**9.0**
1,2-Dichloropropane	1	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	3.0 U [3.0 U]	NA	15 U
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	1.0 U [1.0 U]	NA	5.0 U
Acetone (2-propanone)	50	5.0 UJ	5.0 U [5.0 U]	5.0 UB	25 U
Benzene	1	1.0 U	1.0 U [1.0 U]	NA	5.0 U
Bromodichloromethane	50	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Bromoform	50	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Carbon disulfide	- -	1.0 U	1.0 U [1.0 U]	NA	5.0 U
Carbon tetrachloride	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chlorobenzene	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chlorodifluoromethane (Freon 22)	- -	**3.0**	1.0 U [1.0 U]	1.0 UB	5.0 U
Chloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chloroform	7	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 UJ	1.0 UJ [1.0 U]	NA	5.0 U
Cyclohexane	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Dibromochloromethane	50	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UJ	1.0 UJ [1.0 U]	1.0 U	5.0 U
Ethylbenzene	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Methyl Acetate	- -	1.0 U	1.0 U [1.0 U]	NA	5.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Methyl cyclohexane	- -	1.0 U	1.0 U [1.0 U]	NA	5.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Methylene chloride	5	2.0 U	2.0 U [2.0 U]	2.0 UB	10 U
Styrene	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Tetrachloroethene (PCE)	5	**8.0**	**5.0 [6.0]**	**3.1**	**63**
Toluene	5	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Trichloroethene (TCE)	5	**15**	**11 [13]**	**3.8**	**62**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Vinyl chloride	2	1.0 U	1.0 U [1.0 U]	1.0 U	5.0 U
Xylenes (total)	5	3.0 U	3.0 U [3.0 U]	1.0 U	15 U
Total VOCs	- -	**59**	**37 [47]**	**8.2 J**	**740**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	23MI 12/16/09 220-11140-9	23MM 05/08/06 212806-014	23MM 12/16/09 220-11140-7	24GL 05/04/06 212806-004
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**15**	**18**	**8.6**	**4.0**
1,1,2-Trichloroethane	1	**0.23 J**	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**0.67 J**	1.0 U	**0.67 J**	1.0 U
1,1-Dichloroethene	5	**1.8**	**1.0**	**0.67 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 UJ	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	**0.63 J**	1.0 U	**0.61 J**	1.0 U
1,2-Dichloroethene (cis)	5	**320 D**	**500 D**	**300 D**	**16**
1,2-Dichloroethene (trans)	5	**3.5**	**3.0**	**3.3**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**4.7**	**4.0**	**5.2**	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.83 J**	**0.90 J**	**0.62 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.32 J**	1.0 U	**0.29 J**	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	**0.12 J**	1.0 U	**0.18 J**	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**66**	**52**	**31**	**5.0**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**82**	**100**	**49**	**12**
Trichlorofluoromethane (Freon 11)	- -	**0.37 J**	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	**0.19 J**	1.0 U	**0.45 J**	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**500 J**	**680 J**	**400 J**	**37**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	24GL 06/05/09 220-9279-3	24MI 05/04/06 212806-003	24MI 12/28/09 220-11193-6	25GL 05/01/06 212764-013
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.24 J**	**11**	**5.5 [5.5]**	**0.80 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	**0.23 J [0.24 J]**	1.0 U
1,1-Dichloroethene	5	1.0 U	**0.80 J**	**1.0 U [0.32 J]**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 UJ	3.0 U [3.0 U]	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	**0.31 J [0.34 J]**	1.0 U
1,2-Dichloroethene (cis)	5	1.0 UB	**260 D**	**140 [140]**	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U	**4.0**	**8.3 [6.0]**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB [5.0 UB]	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 U [1.0 UB]	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**2.0**	**1.3 [1.3]**	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloroform	7	1.0 UB	**0.40 J**	**0.28 J [0.27 J]**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	**0.28 J [1.0 U]**	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	**0.46 J [0.45 J]**	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB [2.0 UB]	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Tetrachloroethene (PCE)	5	**1.5**	**52**	**27 [26]**	**1.0 J**
Toluene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Trichloroethene (TCE)	5	**2.8**	**59**	**26 [26]**	**0.50 J**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Vinyl chloride	2	1.0 U	**1.0**	1.0 U [1.0 U]	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U [1.0 U]	3.0 U
Total VOCs	- -	**6.6 J**	**390 J**	**210 J [210 J]**	**2.3 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	25GL 12/18/09 220-11147-4	25MI 04/28/06 212764-010	25MI 12/18/09 220-11147-3	26GL 05/01/06 212764-016
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**3.3**	**4.0**	**4.8**	**4.0**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**0.13 J**	1.0 U	**0.54 J**	1.0 U
1,1-Dichloroethene	5	**0.69 J**	**2.0**	**0.85 J**	**0.90 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**10**	**120**	**28**	**35**
1,2-Dichloroethene (trans)	5	**0.23 J**	**2.0**	**1.8**	**1.0**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UBJ	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**2.6**	**3.0**	**6.0**	**4.0**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	**0.27 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UB	1.0 U	1.0 UB	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**6.9**	**19**	**25**	**16**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**8.7**	**18**	**23**	**27**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	**0.11 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**33 J**	**170**	**90 J**	**88 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	26GL 12/21/09 220-11147-11	26MI 05/01/06 212764-015	26MI 12/21/09 220-11147-10	27GL 05/02/06 212764-020
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**4.3**	**5.0**	**4.4**	**4.0**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**0.49 J**	1.0 U	**0.48 J**	1.0 U
1,1-Dichloroethene	5	**2.1**	**2.0**	**2.1**	**1.0**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 UJ	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**24**	**35**	**26**	**30**
1,2-Dichloroethene (trans)	5	**0.70 J**	**0.40 J**	**0.59 J**	**1.0**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB	5.0 U
Benzene	1	NA	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**5.5**	**4.0**	**5.5**	**4.0**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.27 J**	1.0 U	**0.27 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 UB	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.15 J**	1.0 U	**0.13 J**	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	**0.15 J**	1.0 U	**0.16 J**	1.0 U
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**21**	**19**	**18**	**15**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**20**	**28**	**19**	**24**
Trichlorofluoromethane (Freon 11)	- -	**0.11 J**	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**79 J**	**93 J**	**77 J**	**79**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	27GL 12/30/09 220-11193-16	27MI 05/02/06 212764-019	27MI 06/05/09 220-9279-4	28GL 05/15/06 212874-015
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**4.4**	**4.0**	**4.7**	**62**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**0.57 J**	1.0 U	**0.46 J**	1.0 U
1,1-Dichloroethene	5	**2.3**	**2.0**	**1.7**	**4.0**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 UJ	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	**4.0**
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**25**	**28**	**23**	**1,200 D**
1,2-Dichloroethene (trans)	5	**0.48 J**	**2.0**	**0.79 J**	**1.0**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	**0.60 J**
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB	5.0 U
Benzene	1	NA	1.0 U	NA	**1.0**
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Carbon disulfide	- -	NA	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**4.6**	**3.0**	**3.9**	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Chloroform	7	**0.27 J**	1.0 U	1.0 UB	**0.60 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	**0.12 J**	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	**0.14 J**	**1.0**
Methylene chloride	5	2.0 UB	2.0 U	**0.35 JB**	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**19**	**12**	**17**	**100**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**22**	**21**	**18**	**80**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	**0.10 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	**200**
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**79 J**	**72**	**72 J**	**1,700 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	28GL 06/04/09 220-9271-16	28GL 06/23/09 220-9451-12	28MI 05/15/06 212874-014	28MI 06/04/09 220-9271-15
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	**0.26 J**	1.0 U	1.0 U [1.0 U]
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**72**	**97**	**12**	**1.6 [1.6]**
1,1,2-Trichloroethane	1	**0.33 J**	**0.32 J**	1.0 U	1.0 U [1.0 U]
1,1-Dichloroethane	5	**1.4**	**1.6**	1.0 U	**0.11 J [0.11 J]**
1,1-Dichloroethene	5	**5.7**	**7.2**	**0.90 J**	1.0 U [1.0 U]
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2,4-Trichlorobenzene	- -	1.0 U	**0.11 J**	1.0 U	1.0 U [1.0 U]
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U [3.0 U]
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichlorobenzene	- -	**13**	**10**	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethane	0.6	**0.79 J**	**0.78 J**	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethene (cis)	5	**1,600 D**	**1,700 D**	**310 D**	**50 [52]**
1,2-Dichloroethene (trans)	5	**7.8**	**1.9**	**5.0**	**3.0 [2.6]**
1,2-Dichloropropane	1	**0.54 J**	**0.58 J**	1.0 U	1.0 U [1.0 U]
1,3-Dichlorobenzene	- -	**0.32 J**	**0.30 J**	1.0 U	1.0 U [1.0 U]
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,4-Dichlorobenzene	- -	**1.6**	**1.3**	1.0 U	1.0 U [1.0 U]
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
2-Butanone (Methyl ethyl ketone)	50	NA	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UB	5.0 U	5.0 UB [5.0 UB]
Benzene	1	NA	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 U	1.0 UJ [1.0 UJ]
Carbon disulfide	- -	NA	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chlorodifluoromethane (Freon 22)	- -	**0.95 J**	**1.3**	**3.0**	**0.61 J [0.60 J]**
Chloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U [1.0 U]
Chloroform	7	1.0 UB	**0.74 J**	1.0 U	1.0 U [1.0 U]
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloropentafluoroethane (Freon 115)	- -	NA	NA	1.0 U	NA
Cyclohexane	- -	**1.2**	**1.4**	1.0 U	1.0 U [1.0 U]
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	**3.1 J**	1.0 U	1.0 U [1.0 U]
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl Acetate	- -	NA	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl cyclohexane	- -	NA	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	**0.73 J**	**0.65 J**	1.0 U	**0.31 J [0.31 J]**
Methylene chloride	5	2.0 UB	2.0 UB	2.0 U	2.0 UB [2.0 UB]
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Tetrachloroethene (PCE)	5	**160**	**200**	**45**	**7.8 [7.6]**
Toluene	5	**0.12 J**	**0.13 J**	1.0 U	1.0 U [1.0 U]
Trichloroethene (TCE)	5	**76**	**87**	**34**	**4.5 [4.5]**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Vinyl chloride	2	**560 D**	**550 D**	1.0 U	**0.11 J [0.13 J]**
Xylenes (total)	5	1.0 U	1.0 U	3.0 U	1.0 U [1.0 U]
Total VOCs	- -	**2,500 J**	**2,700 J**	**410 J**	**69 J [71 J]**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	29GL 05/02/06 212764-022	29GL 06/04/09 220-9271-13	29MI 05/02/06 212764-021	29MI 06/04/09 220-9271-14
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**7.0**	**1.6**	**9.0**	**5.9**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	**0.27 J**
1,1-Dichloroethene	5	1.0 U	1.0 U	**0.70 J**	**0.40 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 UJ	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**68**	**21**	**320 D**	**160**
1,2-Dichloroethene (trans)	5	1.0 U	**0.36 J**	**1.0**	**1.2**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**0.23 J**	**2.0**	**1.2**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 UB	1.0 U	1.0 UB
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	**0.17 J**	1.0 U	**0.41 J**
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**23**	**9.7**	**30**	**26**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**29**	**9.3**	**26**	**24**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	**0.10 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	**0.16 J**
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**130**	**44 J**	**390 J**	**220 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	30GL 05/19/06 212899-016	30GL 12/17/09 220-11140-15	30MI 05/19/06 212899-018	30MI 12/17/09 220-11140-14
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	**0.30 J**
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	1.0 U [1.0 U]	**0.46 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	**0.33 J**
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U [1.0 U]	**1.2**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U [3.0 U]	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	1.0 U	1.0 U [1.0 U]	**0.33 J**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U [3.0 U]	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U [1.0 U]	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U [5.0 U]	5.0 UB
Benzene	1	1.0 U	NA	1.0 U [1.0 U]	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U [1.0 U]	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	**1.0 U [1.0]**	**14**
Chloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U [1.0 U]	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U [1.0 U]	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U [1.0 U]	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U [2.0 U]	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	1.0 U	2.0 U [2.0 U]	**0.29 J**
Toluene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Trichloroethene (TCE)	5	1.0 U	1.0 U	**1.0 U [0.80 J]**	**1.7**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U [3.0 U]	1.0 U
Total VOCs	- -	5.0 U	5.0 U	**5.0 U [1.8 J]**	**19 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	30ML 05/19/06 212899-017	30ML 12/17/09 220-11140-13	31GL 03/28/06 212471-006	31GL 04/26/06 212727-017
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	**0.52 J**	1.0 U [1.0 U]	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1-Dichloroethane	5	1.0 U	**0.21 J**	1.0 U [1.0 U]	1.0 U
1,1-Dichloroethene	5	1.0 U	**1.4**	1.0 U [1.0 U]	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 UJ
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U [3.0 U]	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethene (cis)	5	**1.0 J**	**0.59 J**	**2.0 [2.0]**	**2.0**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U [3.0 U]	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U [1.0 U]	1.0 U
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U [5.0 U]	5.0 U
Benzene	1	1.0 U	NA	1.0 U [1.0 U]	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U [1.0 U]	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**1.0**	**3.7**	1.0 U [1.0 U]	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U [1.0 U]	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U [1.0 U]	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U [1.0 U]	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U [2.0 U]	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	**0.38 J**	2.0 U [2.0 U]	2.0 U
Toluene	5	1.0 U	1.0 U	1.0 U [1.0 U]	**0.80 J**
Trichloroethene (TCE)	5	**1.0 J**	**1.8**	1.0 U [1.0 U]	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U [3.0 U]	3.0 U
Total VOCs	- -	**3.0 J**	**8.6 J**	**2.0 [2.0]**	**2.8 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	31GL 05/31/06 213002-004	31GL 06/28/06 213191-006	31GL 07/26/06 213336-008	31GL 03/26/09 220-8544-1
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**2.0**	**1.0 UJ [2.0 J]**	**3.0**	**1.1**
1,1,2-Trichloroethane	1	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 UJ	1.0 U [1.0 U]	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U [3.0 U]	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**28**	**21 J [31 J]**	**37**	**16**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	3.0 U [3.0 U]	3.0 UJ	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UJ [5.0 UJ]	5.0 U	5.0 UB
Benzene	1	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 UJ	1.0 U [1.0 U]	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 UJ	1.0 U
Chloroform	7	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 UB
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	1.0 UJ [1.0 UJ]	1.0 UJ	NA
Cyclohexane	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U [1.0 U]	1.0 UJ	1.0 U
Ethylbenzene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	1.0 U [1.0 U]	1.0 UJ	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	1.0 U [1.0 U]	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Methylene chloride	5	2.0 U	7.0 U [2.0 U]	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**2.0**	**2.0 UJ [2.0 J]**	**3.0 J**	**1.4**
Toluene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Trichloroethene (TCE)	5	**9.0**	**4.0 J [9.0 J]**	**11**	**4.4**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	3.0 U [3.0 U]	3.0 U	1.0 U
Total VOCs	- -	**41**	**25 J [44 J]**	**54 J**	**25 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	31GL 06/03/09 220-9271-8	31GL 09/23/09 220-10224-9	31GL 11/02/09 220-10596-13	31MI 03/28/06 212471-005
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**1.0**	**0.49 J**	**0.46 J**	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**15**	**8.0**	**7.4**	**7.0**
1,2-Dichloroethene (trans)	5	**0.20 J**	**0.11 J**	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 UB	5.0 UB	5.0 U
Benzene	1	NA	NA	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**1.5**	**1.2**	**1.1**	2.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**3.8**	**2.6**	**2.6**	**2.0**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	3.0 U
Total VOCs	- -	**23 J**	**12 J**	**12 J**	**9.0**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	31MI 04/26/06 212727-018	31MI 05/31/06 213002-001	31MI 06/28/06 213191-008	31MI 07/26/06 213336-010
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**1.0 J**	**2.0**	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**14**	**29**	**6.0**	**6.0**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	3.0 U	3.0 U	3.0 UJ
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Acetone (2-propanone)	50	5.0 U	5.0 U	5.0 UJ	5.0 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	1.0 U	1.0 UJ	1.0 UJ
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**1.0 J**	**3.0**	2.0 U	2.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**4.0**	**11**	**2.0**	**2.0**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	3.0 U	3.0 U	3.0 U
Total VOCs	- -	**20 J**	**45**	**8.0**	**8.0**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	31MI 03/26/09 220-8544-2	31MI 06/03/09 220-9271-10	31MI 09/23/09 220-10224-10	31MI 11/02/09 220-10596-11
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**15 [16]**	**15**	**15 [15]**	**14 [14 J]**
1,1,2-Trichloroethane	1	**0.21 J [0.22 J]**	**0.20 J**	**0.22 J [0.24 J]**	**0.26 J [0.24 J]**
1,1-Dichloroethane	5	**0.30 J [0.29 J]**	**0.28 J**	**0.27 J [0.31 J]**	**0.34 J [0.33 J]**
1,1-Dichloroethene	5	**0.47 J [0.67 J]**	**0.53 J**	**0.59 J [0.56 J]**	**0.63 J [0.58 J]**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
1,2,4-Trichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
1,2-Dibromo-3-chloropropane	- -	3.0 U [3.0 U]	3.0 U	3.0 U [3.0 U]	3.0 U [3.0 UJ]
1,2-Dibromoethane	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
1,2-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
1,2-Dichloroethane	0.6	**0.82 J [0.86 J]**	**0.91 J**	**0.85 J [0.84 J]**	**1.0 J [0.95 J]**
1,2-Dichloroethene (cis)	5	**190 D [190 D]**	**210 D**	**220 D [230 D]**	**230 D [210 D]**
1,2-Dichloroethene (trans)	5	**0.93 J [0.89 J]**	**1.3**	**1.5 [1.6]**	**0.96 J [0.90 J]**
1,2-Dichloropropane	1	**0.27 J [0.24 J]**	**0.21 J**	**0.26 J [0.24 J]**	**0.32 J [0.27 J]**
1,3-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
1,3-Dichloropropene (cis)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 UJ [1.0 UJ]
1,3-Dichloropropene (trans)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
1,4-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U [1.0 U]	1.0 U	**0.16 J [0.18 J]**	1.0 U [1.0 UJ]
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB [5.0 UB]	5.0 UB	5.0 U [5.0 U]	5.0 UB [5.0 UBJ]
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Bromoform	50	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Bromomethane (Methyl bromide)	5	1.0 U [1.0 U]	1.0 UJ	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Chlorobenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Chlorodifluoromethane (Freon 22)	- -	**2.7 J [2.8]**	**2.0**	**2.7 [2.7]**	**2.9 [2.9 J]**
Chloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Chloroform	7	1.0 UB [1.0 UB]	**0.98 J**	**0.91 J [0.93 J]**	**1.1 [1.0 J]**
Chloromethane (Methyl chloride)	5	1.0 U [1.0 U]	1.0 U	**0.21 J [1.0 U]**	1.0 U [1.0 UJ]
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Dichlorodifluoromethane (Freon 12)	- -	1.0 U [1.0 U]	**0.26 J**	**0.23 J [1.0 U]**	**0.18 J [1.0 UJ]**
Ethylbenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Isopropylbenzene (Cumene)	- -	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U [1.0 U]	1.0 U	1.0 UJ [1.0 UJ]	1.0 U [1.0 UJ]
Methylene chloride	5	2.0 UB [2.0 UB]	2.0 UB	2.0 UBJ [2.0 UBJ]	2.0 UB [2.0 UBJ]
Styrene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Tetrachloroethene (PCE)	5	**23 [23]**	**21**	**28 [28]**	**28 [27 J]**
Toluene	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Trichloroethene (TCE)	5	**69 J [68]**	**71**	**69 [70]**	**77 [74 J]**
Trichlorofluoromethane (Freon 11)	- -	**0.46 J [0.49 J]**	**0.46 J**	**0.45 J [0.44 J]**	**0.46 J [0.45 J]**
Vinyl chloride	2	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 UJ]	1.0 U [1.0 UJ]
Xylenes (total)	5	1.0 U [1.0 U]	1.0 U	1.0 U [1.0 U]	1.0 U [1.0 UJ]
Total VOCs	- -	**310 J [310 J]**	**330 J**	**340 J [350 J]**	**360 J [330 J]**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	31ML 04/26/06 212727-019	31ML 05/31/06 213002-002	31ML 06/28/06 213191-007	31ML 07/26/06 213336-009
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U [1.0 U]	1.0 UJ	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 UJ [1.0 UJ]	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U [3.0 U]	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U [3.0 U]	3.0 U	3.0 U	3.0 UJ
4-Methyl-2-pentanone (MIBK)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Acetone (2-propanone)	50	5.0 U [5.0 U]	5.0 U	5.0 UJ	5.0 U
Benzene	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U [1.0 U]	1.0 UJ	1.0 U	1.0 U
Chloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U [1.0 U]	1.0 U	1.0 UJ	1.0 UJ
Cyclohexane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 UJ
Ethylbenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 UJ
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U
Styrene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 U
Toluene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U [3.0 U]	3.0 U	3.0 U	3.0 U
Total VOCs	- -	5.0 U [5.0 U]	5.0 U	5.0 U	5.0 U

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	31ML 03/26/09 220-8544-3	31ML 06/03/09 220-9271-9	31ML 09/23/09 220-10224-11	31ML 11/02/09 220-10596-12
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.45 J**	**0.30 J**	**0.14 J**	**0.51 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**3.3**	**2.0**	**2.5**	**4.9**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 UJ
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UB	5.0 UB	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.49 J**	**0.25 J**	**0.37 J**	**0.59 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	**0.11 J**	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**0.64 J**	**0.39 J**	**0.33 J**	**0.81 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**1.8**	**1.1**	**1.1**	**2.3**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 UJ	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	1.0 U
Total VOCs	- -	**8.6 J**	**5.6 J**	**4.6 J**	**9.1 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	33GL 05/30/06 212989-008	33GL 01/06/10 220-11239-13	33MI 05/30/06 212989-007	33MI 01/06/10 220-11239-14
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 UJ	1.0 U	1.0 UJ	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	**0.72 J**	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 UJ	NA	1.0 UJ	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	1.0 U	2.0 U	**0.34 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**7.0**	1.0 U	1.0 U	**1.3**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**7.0**	**3.0 J**	5.0 U	**4.0 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	33ML 05/30/06 212989-011	33ML 01/06/10 220-11239-15	35GL 05/15/06 212874-016	35GL 12/23/09 220-11147-20
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**2.0 J**	**1.4**	**6.0**	**20**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	**0.45 J**
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	**2.0**
1,1-Dichloroethene	5	1.0 U	**0.17 J**	**1.0**	**5.1**
1,1-Difluoroethane (Freon 152a)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	**1.0**	**2.9**
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	**2.8**
1,2-Dichloroethene (cis)	5	**4.0**	**2.8**	**420 D**	**1,800 D**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	**0.50 J**	**2.3**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	**0.56 J**
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	**0.38 J**
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	**0.80 J**	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	**0.36 J**	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	**0.12 J**
Chlorodifluoromethane (Freon 22)	- -	**0.40 J**	**0.32 J**	1.0 U	**1.8**
Chloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroform	7	1.0 U	**0.33 J**	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	**0.68 J**
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	**0.21 J**	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	**0.20 J**
Methyl Acetate	- -	1.0 UJ	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 UJ	1.0 U	**0.60 J**	**0.29 J**
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**3.0**	**1.8**	**15**	**29**
Toluene	5	1.0 U	1.0 U	1.0 U	**0.15 J**
Trichloroethene (TCE)	5	**21**	**14**	**24**	**63**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	**17**	**92**
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	**0.20 J**
Total VOCs	- -	**30 J**	**23 J**	**490 J**	**2,000 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	36GL 05/11/06 212874-005	36GL 12/23/09 220-11147-19	37MI 06/06/06 213025-007	37MI 12/29/09 220-11193-9
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	**27**	**18**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	**0.30 J**
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	**0.92 J**
1,1-Dichloroethene	5	1.0 U	1.0 U	**2.0**	**1.5**
1,1-Difluoroethane (Freon 152a)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 UJ	1.0 U	1.0 U	**1.1**
1,2-Dichloroethene (cis)	5	1.0 U	1.0 U	**560 D**	**580 D**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	**3.0**	**3.8**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	**0.43 J**
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 UJ	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UJ	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	**3.0**	**4.4**
Chloroethane	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	**1.0**	**1.1**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 UJ	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UJ	1.0 U	1.0 U	**0.41 J**
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 UJ	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	**0.29 J**	**72**	**39**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U	**0.17 J**	**150**	**94**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	**0.80 J**	**0.58 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	5.0 U	**0.46 J**	**820 J**	**750 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	37ML 06/06/06 213025-009	37ML 06/23/09 220-9451-14	37MU 06/06/06 213025-008	37MU 12/29/09 220-11193-10
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**17**	**21**	**7.0**	**7.4**
1,1,2-Trichloroethane	1	1.0 U	**0.29 J**	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	**0.61 J**	1.0 U	**0.42 J**
1,1-Dichloroethene	5	**0.90 J**	**1.5**	1.0 U	**0.56 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	**1.2**	1.0 U	**0.45 J**
1,2-Dichloroethene (cis)	5	**280 D**	**400 D**	**200**	**220 D**
1,2-Dichloroethene (trans)	5	**1.0**	**1.7**	**0.90 J**	**1.4**
1,2-Dichloropropane	1	1.0 U	**0.31 J**	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**2.6**	**29**	**26**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**1.0**	**1.6**	**0.50 J**	**0.56 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 UB	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**39**	**39**	**25**	**33**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**120**	**120**	**60**	**51**
Trichlorofluoromethane (Freon 11)	- -	**1.0**	**1.6**	**0.60 JM**	**0.31 J**
Vinyl chloride	2	1.0 U	**0.20 J**	1.0 U	**0.35 J**
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**460 J**	**590 J**	**320 J**	**340 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	38MI 05/23/06 212940-012	38MI 06/08/09 220-9279-11	38ML 05/17/06 212899-009	38ML 06/08/09 220-9279-10
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**26**	**29**	**12**	**9.5**
1,1,2-Trichloroethane	1	1.0 U	**0.21 J**	1.0 U	**0.14 J**
1,1-Dichloroethane	5	1.0 U	**0.77 J**	1.0 U	**0.21 J**
1,1-Dichloroethene	5	**1.0**	**1.8**	1.0 U	**0.54 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 UJ	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	**1.8**	1.0 U	**0.68 J**
1,2-Dichloroethene (cis)	5	**530 D**	**580 D**	**170**	**200**
1,2-Dichloroethene (trans)	5	**6.0**	**3.2**	**3.0**	**1.7**
1,2-Dichloropropane	1	1.0 U	**0.44 J**	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 UJ	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 UJ	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**2.0**	**2.0**	**0.60 J**	**0.62 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**2.0**	2.1 UB	**0.80 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	**0.29 J**	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 UJ	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**94**	**95**	**29**	**28**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**170**	**190**	**73**	**61**
Trichlorofluoromethane (Freon 11)	- -	**2.0**	**1.5**	**1.0**	**0.86 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**830**	**910 J**	**290 J**	**310 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	38MU 05/23/06 212940-011	38MU 06/22/09 220-9451-4	39MI 06/07/06 213025-011	39MI 06/09/09 220-9279-12
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**1.0**	**3.9 B**	**20**	**1.3**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	**0.27 J**	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 UB	**3.0**	**0.52 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	**0.35 J**	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**100**	**170 J**	**570 D**	**5.3**
1,2-Dichloroethene (trans)	5	**2.0**	**3.2 J**	**1.0**	1.0 U
1,2-Dichloropropane	1	1.0 U	**0.11 J**	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**6.0**	**16 J**	**5.0**	**0.71 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	**0.57 J**	**0.30 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 UB	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**13**	**33 J**	**140**	**44**
Toluene	5	1.0 U	1.0 UB	1.0 U	1.0 U
Trichloroethene (TCE)	5	**30**	**45 J**	**80**	**4.1**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 UB	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**150**	**280 J**	**820 J**	**57 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	39ML 06/07/06 213025-010	39ML 06/09/09 220-9279-13	39MU 05/31/06 212989-015	39MU 06/09/09 220-9279-14
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**2.0**	**6.0**	**6.0**	**5.3**
1,1,2-Trichloroethane	1	1.0 U	**0.21 J**	1.0 U	**0.12 J**
1,1-Dichloroethane	5	1.0 U	**0.14 J**	1.0 U	**0.21 J**
1,1-Dichloroethene	5	1.0 U	**0.53 J**	1.0 U	**0.35 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	**0.36 J**	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**32**	**59**	**360 D**	**230 D**
1,2-Dichloroethene (trans)	5	1.0 U	**0.96 J**	**5.0**	**1.0**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.60 JM**	**1.9**	**0.40 J**	**0.25 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 UB	1.0 U	1.0 UB
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	**0.27 J**	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 UJ	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	**0.52 J**
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**9.0**	**17**	**52**	**23**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**38**	**56**	**92**	**39**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	**0.35 J**	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**82 J**	**140 J**	**520 J**	**300 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	40MI 03/08/10 220-11577-19	41MI 03/10/10 220-11577-30	43MI 03/27/06 212471-002	43MI 04/25/06 212727-013
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	1.0 U	**1.0**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 UB	1.0 U	1.0 U	1.0 UJ
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**0.29 J**	1.0 UB	**7.0**	**14**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	2.0 U	2.0 U	3.0 UJ	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 UB	5.0 U	5.0 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	1.0 UB	1.0 U	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 UJ	1.0 UJ	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Cyclohexane	- -	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 UJ	1.0 UJ	1.0 U	1.0 U
Methyl Acetate	- -	1.0 UJ	1.0 UJ	1.0 U	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Methyl cyclohexane	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 U	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	1.0 U	1.0 U	2.0 U	**1.0 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U	1.0 U	**3.0**	**7.0**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	3.0 U	3.0 U
Total VOCs	- -	**1.3 J**	**2.0 J**	**10**	**23 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	43MI 05/30/06 213002-005	43MI 06/27/06 213191-002	43MI 07/25/06 213336-004	43MI 03/30/09 220-8578-1
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U [1.0 U]	1.0 U	1.0 U	**9.6**
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	**0.48 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 UJ [1.0 UJ]	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U [3.0 U]	3.0 UJ	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U [1.0 U]	1.0 UJ	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U [1.0 U]	1.0 U	1.0 U	**120**
1,2-Dichloroethene (trans)	5	1.0 U [1.0 U]	1.0 U	1.0 U	**0.39 J**
1,2-Dichloropropane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U [3.0 U]	3.0 UJ	3.0 UJ	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	NA
Acetone (2-propanone)	50	5.0 U [5.0 U]	5.0 U	5.0 U	**0.94 J**
Benzene	1	1.0 U [1.0 U]	1.0 U	1.0 U	NA
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U [1.0 U]	1.0 U	1.0 U	NA
Carbon tetrachloride	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 UJ [1.0 UJ]	1.0 U	1.0 U	**11**
Chloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U [1.0 U]	1.0 U	1.0 U	**0.65 J**
Chloromethane (Methyl chloride)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U [1.0 U]	1.0 U	1.0 UJ	NA
Cyclohexane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U [1.0 U]	1.0 U	1.0 UJ	**0.15 J**
Ethylbenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U [1.0 U]	1.0 UJ	1.0 UJ	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U [2.0 U]	2.0 U	2.0 U	2.0 UB
Styrene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U [2.0 U]	2.0 U	2.0 U	**17**
Toluene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U [1.0 U]	1.0 U	1.0 U	**48**
Trichlorofluoromethane (Freon 11)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	**0.53 J**
Vinyl chloride	2	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U [3.0 U]	3.0 U	3.0 U	1.0 U
Total VOCs	- -	5.0 U [5.0 U]	5.0 U	5.0 U	**210 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	43MI 04/25/09 220-8899-7	43MI 05/28/09 220-9195-3	43MI 06/24/09 220-9482-3	43MI 07/30/09 220-9767-6
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**9.3 [9.3]**	**9.2**	**13**	**8.0**
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	**0.13 J**	**0.10 J**	1.0 U
1,1-Dichloroethane	5	1.0 U [1.0 U]	**0.14 J**	**0.15 J**	1.0 U
1,1-Dichloroethene	5	**0.65 J [0.51 J]**	**0.38 J**	**0.60 J**	**0.33 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	**0.14 J [1.0 UJ]**	1.0 U	1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U [3.0 U]	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	**0.63 J [1.0 U]**	**0.65 J**	**0.61 J**	1.0 U
1,2-Dichloroethene (cis)	5	**120 J [120 J]**	**120**	**140**	**110**
1,2-Dichloroethene (trans)	5	**0.86 J [0.77 J]**	**0.27 J**	**0.96 J**	**0.68 J**
1,2-Dichloropropane	1	1.0 U [1.0 U]	**0.14 J**	**0.11 J**	1.0 U
1,3-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 U [5.0 U]	5.0 UB	5.0 UB	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U [1.0 U]	1.0 U	**0.15 J**	1.0 U
Chlorobenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**14 [14]**	**7.5**	**13**	**12**
Chloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.64 J [0.71 J]**	**0.67 J**	1.0 UB	**0.61 J**
Chloromethane (Methyl chloride)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.28 J [0.30 J]**	**0.20 J**	1.0 UB	1.0 U
Ethylbenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB [2.0 UB]	2.0 UB	2.0 UB	2.0 UB
Styrene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**17 [16]**	**18**	**23**	16 UB
Toluene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**46 [45]**	**54**	**61**	**48**
Trichlorofluoromethane (Freon 11)	- -	**0.56 J [0.52 J]**	**0.47 J**	**0.69 J**	**0.45 J**
Vinyl chloride	2	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Total VOCs	- -	**210 J [210 J]**	**210 J**	**260 J**	**180 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	43MI 08/27/09 220-9994-2	43MI 09/24/09 220-10224-4	43MI 10/30/09 220-10596-3	43ML 03/30/09 220-8578-2
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**9.2**	**8.4**	**8.0**	1.0 U
1,1,2-Trichloroethane	1	1.0 U	**0.13 J**	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	**0.16 J**	1.0 U
1,1-Dichloroethene	5	**0.45 J**	**0.39 J**	**0.44 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	**0.57 J**	**0.67 J**	1.0 U
1,2-Dichloroethene (cis)	5	**130**	**120**	**140**	1.0 U
1,2-Dichloroethene (trans)	5	**0.54 J**	**0.39 J**	**0.38 J**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	**0.20 J**	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	**0.10 J**	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UBJ	5.0 UB	5.0 UB	**1.2 J**
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	**0.25 J**
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**11**	**11**	**13**	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.65 J**	**0.58 J**	**0.70 J**	1.0 U
Chloromethane (Methyl chloride)	5	**0.12 J**	**0.83 J**	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.28 J**	**0.22 J**	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**18**	**18**	**17**	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**49**	**44**	**50**	1.0 U
Trichlorofluoromethane (Freon 11)	- -	**0.45 J**	**0.44 J**	**0.43 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	1.0 U
Total VOCs	- -	**220 J**	**210 J**	**230 J**	**1.8 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	43MU 03/27/06 212471-001	43MU 04/25/06 212727-012	43MU 05/30/06 213002-006	43MU 06/27/06 213191-001
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dichloroethene (cis)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 UJ	3.0 U	3.0 U	3.0 UJ
4-Methyl-2-pentanone (MIBK)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
Acetone (2-propanone)	50	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroethane	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
Cyclohexane	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Methyl Butyl Ketone (2-Hexanone)	50	1.0 UJ	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	2.0 U	2.0 U	2.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	**4.0**
Trichloroethene (TCE)	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	3.0 U	3.0 U	3.0 U
Total VOCs	- -	5.0 U	5.0 U	5.0 U	**4.0**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	43MU 07/25/06 213336-005	43MU 04/25/09 220-8899-5	43MU 05/28/09 220-9195-4	43MU 06/24/09 220-9482-5
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 UJ
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 UJ	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	1.0 UJ	**0.16 J**	**0.13 J**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 UJ	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 UJ	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	NA	NA
Acetone (2-propanone)	50	5.0 U	5.0 UJ	5.0 UB	5.0 UB
Benzene	1	1.0 U	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	NA	NA
Carbon tetrachloride	5	1.0 U	**0.15 J**	**0.25 J**	**0.40 J**
Chlorobenzene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 UJ	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UJ	1.0 UJ	1.0 U	1.0 UB
Ethylbenzene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methyl Acetate	- -	1.0 UJ	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UBJ	2.0 UB	2.0 UB
Styrene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	1.0 UJ	1.0 U	1.0 U
Toluene	5	**3.0**	1.0 UJ	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 UJ	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 UJ	1.0 U	1.0 U
Total VOCs	- -	**3.0**	**0.61 J**	**1.4 J**	**2.0 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	43MU 07/30/09 220-9767-5	43MU 08/27/09 220-9994-1	43MU 09/24/09 220-10224-3	43MU 10/30/09 220-10596-2
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U [3.0 U]	3.0 U [3.0 U]	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**0.12 J [1.0 U]**	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 UJ
1,3-Dichloropropene (trans)	0.4	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	1.0 UB [5.0 UB]	5.0 UBJ [5.0 UBJ]	5.0 UB	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Bromoform	50	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	**0.27 J [0.30 J]**	**0.27 J [0.25 J]**	**0.23 J**	1.0 U
Chlorobenzene	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Chloroethane	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Chloroform	7	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Ethylbenzene	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 UJ	1.0 U
Methylene chloride	5	2.0 UB [2.0 UB]	2.0 UB [2.0 UB]	2.0 UB	2.0 UB
Styrene	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	1.0 UB [1.0 UB]	1.0 U [1.0 U]	1.0 U	1.0 U
Toluene	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Vinyl chloride	2	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Xylenes (total)	5	1.0 U [1.0 U]	1.0 U [1.0 U]	1.0 U	1.0 U
Total VOCs	- -	**0.39 J [0.30 J]**	**0.27 J [0.25 J]**	**0.23 J**	5.0 U

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	44MI 06/01/06 212989-020	44MI 12/30/09 220-11193-14	44MU 05/31/06 212989-014	44MU 12/30/09 220-11193-15
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**23**	**25**	**5.0**	**1.7**
1,1,2-Trichloroethane	1	1.0 U	**0.40 J**	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	**1.2**	1.0 U	1.0 U
1,1-Dichloroethene	5	**2.0**	**1.7**	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	**1.1**	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**520 D**	**630 D**	**88**	**18**
1,2-Dichloroethene (trans)	5	**4.0**	**5.6**	**0.90 J**	**0.26 J**
1,2-Dichloropropane	1	1.0 U	**0.48 J**	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	**0.34 J**	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U	5.0 UB
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**5.0**	**4.9**	**2.0 J**	**0.42 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.80 J**	**1.1**	1.0 U	**0.25 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	**0.46 J**	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 UJ	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	**0.56 J**
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**70**	**70**	**13**	**4.9**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**110**	**120**	**28**	**9.1**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	**0.41 J**	**0.40 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**730 J**	**860 J**	**140 J**	**35 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	45MI 06/01/06 212989-018	45MI 03/31/09 220-8597-2	45MI 04/27/09 220-8899-20	45MI 05/29/09 220-9206-4
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**1.0**	**1.5**	**1.6 J**	**1.6**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	**0.31 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 UJ	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichloroethene (cis)	5	**21**	**12**	**11 J**	**15**
1,2-Dichloroethene (trans)	5	1.0 U	**0.13 J**	**0.16 J**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 UJ	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	NA	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 UBJ	5.0 UB
Benzene	1	1.0 U	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 UJ	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 UJ	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Carbon disulfide	- -	1.0 U	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	**0.35 J**	**0.29 J**
Chlorobenzene	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	**0.31 J**	**0.35 J**	**0.17 J**
Chloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroform	7	**0.40 J**	1.0 UB	1.0 UBJ	**0.43 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 UJ	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	**0.18 J**	1.0 UJ	**0.20 J**
Ethylbenzene	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Methyl Acetate	- -	1.0 U	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 UJ	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 UBJ	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Tetrachloroethene (PCE)	5	**3.0**	**4.2**	**3.7 J**	**3.7**
Toluene	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Trichloroethene (TCE)	5	**22**	**15**	**12 J**	**16**
Trichlorofluoromethane (Freon 11)	- -	**0.80 J**	**0.66 J**	**0.78 J**	**0.65 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 UJ	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	1.0 UJ	1.0 U
Total VOCs	- -	**48 J**	**36 J**	**32 J**	**39 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	45MI 06/29/09 220-9511-4	45MI 07/30/09 220-9767-4	45MI 08/27/09 220-9994-4	45MI 09/24/09 220-10224-2
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.30 J [0.31 J]**	**1.3**	**1.3**	**1.7**
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	**0.12 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U [3.0 U]	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**2.3 [2.4]**	**14**	**14**	**17**
1,2-Dichloroethene (trans)	5	1.0 U [1.0 U]	**0.11 J**	**0.12 J**	**0.17 J**
1,2-Dichloropropane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB [5.0 UB]	5.0 UB	5.0 UBJ	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ [1.0 UJ]	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U [1.0 U]	1.0 U	1.0 U	**0.22 J**
Chlorobenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U [1.0 U]	**0.25 J**	**0.24 J**	**0.27 J**
Chloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 UB [1.0 UB]	**0.39 J**	**0.39 J**	**0.45 J**
Chloromethane (Methyl chloride)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.13 J [1.0 U]**	1.0 U	**0.20 J**	**0.17 J**
Ethylbenzene	5	1.0 U [1.0 UB]	**0.11 J**	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 UJ
Methylene chloride	5	2.0 UB [2.0 UB]	2.0 UB	2.0 UB	**2.0 JB**
Styrene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**1.4 [1.4]**	1.0 UB	**2.9**	**4.0**
Toluene	5	1.0 UB [1.0 UB]	**1.9**	**7.3**	**1.8**
Trichloroethene (TCE)	5	**3.1 [3.2]**	**12**	**12**	**15**
Trichlorofluoromethane (Freon 11)	- -	**0.10 J [1.0 U]**	**0.49 J**	**0.49 J**	**0.63 J**
Vinyl chloride	2	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 UB [1.0 UB]	**0.59 J**	**0.19 J**	1.0 U
Total VOCs	- -	**12 J [13 J]**	**31 J**	**39 J**	**44 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	45ML 11/02/09 220-10596-9	45MU 06/01/06 212989-019	45MU 03/31/09 220-8597-1	45MU 04/27/09 220-8899-19
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.88 J**	**0.60 J**	**3.4**	**3.3 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1-Dichloroethene	5	1.0 U	1.0 U	**0.24 J**	**0.31 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dichloroethane	0.6	**0.15 J**	1.0 U	1.0 U	1.0 UJ
1,2-Dichloroethene (cis)	5	**11**	**13**	**65**	**57 J**
1,2-Dichloroethene (trans)	5	**0.17 J**	**0.30 J**	**1.1**	**0.67 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 UJ
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,3-Dichloropropene (cis)	0.4	1.0 UJ	1.0 U	1.0 U	1.0 UJ
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 UJ
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	NA	NA
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB	5.0 UBJ
Benzene	1	NA	1.0 U	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 UJ
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 UJ
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Carbon disulfide	- -	NA	1.0 U	NA	NA
Carbon tetrachloride	5	**0.14 J**	1.0 U	1.0 U	1.0 UJ
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Chlorodifluoromethane (Freon 22)	- -	**0.24 J**	1.0 U	**0.71 J**	**0.71 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Chloroform	7	**0.40 J**	1.0 U	1.0 UB	1.0 UBJ
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 UJ
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	**0.12 J**	1.0 UJ
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Methyl Acetate	- -	NA	1.0 U	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 UJ
Methyl cyclohexane	- -	NA	1.0 U	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Methylene chloride	5	2.0 UB	2.0 U	2.0 UB	2.0 UBJ
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Tetrachloroethene (PCE)	5	**2.1**	**2.0**	**11**	**11 J**
Toluene	5	**0.40 J**	1.0 U	1.0 U	1.0 UJ
Trichloroethene (TCE)	5	**9.3**	**8.0**	**26**	**22 J**
Trichlorofluoromethane (Freon 11)	- -	**0.36 J**	1.0 U	**0.36 J**	**0.36 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 UJ
Xylenes (total)	5	1.0 U	3.0 U	1.0 U	1.0 UJ
Total VOCs	- -	**25 J**	**24 J**	**110 J**	**97 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	45MU 05/29/09 220-9206-3	45MU 06/25/09 220-9482-11	45MU 07/30/09 220-9767-3	45MU 08/27/09 220-9994-3
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**2.9**	**3.7 J [3.6 J]**	**3.1**	**3.2**
1,1,2-Trichloroethane	1	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,1-Dichloroethane	5	**0.11 J**	**0.12 J [0.12 J]**	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.19 J**	**0.30 J [0.28 J]**	**0.25 J**	**0.22 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	**0.18 J**	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U [3.0 U]	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	**1.0 U [0.23 J]**	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**63**	**66 J [66 J]**	**69**	**71**
1,2-Dichloroethene (trans)	5	**0.45 J**	1.0 UB [1.0 UB]	**0.73 J**	**0.68 J**
1,2-Dichloropropane	1	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UB [5.0 UB]	5.0 UB	5.0 UJ
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	**0.10 J**	**0.13 J [0.13 J]**	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.37 J**	**0.47 J [0.52 J]**	**0.70 J**	**0.61 J**
Chloroethane	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chloroform	7	**0.38 J**	1.0 UB [1.0 UB]	**0.36 J**	**0.39 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.19 J**	**0.14 J [0.20 J]**	**0.20 J**	**0.19 J**
Ethylbenzene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UBJ [2.0 UBJ]	2.0 UB	2.0 UB
Styrene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**11**	**11 J [12 J]**	13 UB	**14**
Toluene	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Trichloroethene (TCE)	5	**27**	**26 J [26 J]**	**28**	**28**
Trichlorofluoromethane (Freon 11)	- -	**0.30 J**	**0.36 J [0.37 J]**	**0.31 J**	**0.28 J**
Vinyl chloride	2	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U [1.0 U]	1.0 U	1.0 U
Total VOCs	- -	**110 J**	**110 J [110 J]**	**100 J**	**120 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	45MU 09/24/09 220-10224-1	45MU 11/02/09 220-10596-8	46MI 05/25/06 212940-020	46MI 03/27/09 220-8569-2
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**3.0**	**3.2**	**1.0**	**4.2**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	**0.13 J**	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.26 J**	**0.27 J**	1.0 U	**0.16 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	**0.31 J**	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**70**	**84**	**16**	**44**
1,2-Dichloroethene (trans)	5	**0.60 J**	**0.60 J**	1.0 U	**0.77 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UB	5.0 U	**0.99 J**
Benzene	1	NA	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.57 J**	**0.74 J**	1.0 U	**0.58 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.36 J**	**0.44 J**	1.0 U	**0.55 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.18 J**	1.0 U	1.0 U	**0.13 J**
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**13**	**17**	**2.0**	**4.2**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**26**	**32**	**10**	**22**
Trichlorofluoromethane (Freon 11)	- -	**0.27 J**	**0.29 J**	**0.40 J**	**0.66 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**110 J**	**140 J**	**29 J**	**79 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	46MI 04/24/09 220-8899-3	46MI 06/05/09 220-9279-5	46MI 06/26/09 220-9493-4	46MI 07/31/09 220-9767-13
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 UJ	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 UJ	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**6.0 J**	**4.1**	**5.0 J**	**3.8**
1,1,2-Trichloroethane	1	1.0 UJ	1.0 U	**0.11 J**	1.0 U
1,1-Dichloroethane	5	1.0 UJ	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.21 J**	1.0 U	**0.20 J**	**0.11 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 UJ	**0.27 J**	**0.41 J**	1.0 U
1,2-Dichloroethene (cis)	5	**53 J**	**44**	**58**	**57**
1,2-Dichloroethene (trans)	5	**0.68 J**	**0.48 J**	1.0 UB	**0.81 J**
1,2-Dichloropropane	1	1.0 UJ	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 UJ	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 UJ	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UJ	5.0 UB	5.0 UB	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 UJ	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 UJ	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 UJ	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 UJ	1.0 U	**0.11 J**	1.0 U
Chlorobenzene	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.82 J**	**0.43 J**	**0.48 J**	**0.68 J**
Chloroethane	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.63 J**	1.0 UB	**0.65 J**	**0.64 J**
Chloromethane (Methyl chloride)	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Dibromochloromethane	50	1.0 UJ	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 UJ	**0.16 J**	1.0 UBJ	1.0 U
Ethylbenzene	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 UJ	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 UJ	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UBJ	2.0 UB	2.0 UBJ	2.0 UB
Styrene	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**5.9 J**	**3.8**	**5.0**	3.3 UB
Toluene	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**26 J**	**22**	**27**	**27**
Trichlorofluoromethane (Freon 11)	- -	**0.90 J**	**0.64 J**	**0.78 J**	**0.62 J**
Vinyl chloride	2	1.0 UJ	1.0 U	1.0 UJ	1.0 U
Xylenes (total)	5	1.0 UJ	1.0 U	1.0 U	1.0 U
Total VOCs	- -	**95 J**	**78 J**	**100 J**	**130 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	46MI 08/31/09 220-9994-10	46MI 09/29/09 220-10260-4	46ML 05/25/06 212940-021	46ML 03/27/09 220-8569-1
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**5.5**	**5.3**	1.0 U	**0.51 J**
1,1,2-Trichloroethane	1	**0.11 J**	**0.10 J**	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.17 J**	**0.22 J**	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	**0.42 J**	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**61**	**60**	1.0 U	**4.8**
1,2-Dichloroethene (trans)	5	**0.40 J**	**0.53 J**	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UJ	5.0 U	5.0 U	**0.91 J**
Benzene	1	NA	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.56 J**	**0.65 J**	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroform	7	**0.65 J**	**0.61 J**	1.0 U	**0.11 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.17 J**	**0.14 J**	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**6.3**	**7.6**	2.0 U	**0.85 J**
Toluene	5	1.0 U	1.0 U	**0.60 J**	1.0 U
Trichloroethene (TCE)	5	**31**	**30**	1.0 U	**5.3**
Trichlorofluoromethane (Freon 11)	- -	**0.68 J**	**0.68 J**	1.0 U	**0.40 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**110 J**	**110 J**	**0.60 J**	**13 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	46ML 04/24/09 220-8899-2	46ML 06/05/09 220-9279-6	46ML 06/26/09 220-9493-5	46ML 07/31/09 220-9767-12
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.49 J**	**0.46 J**	**0.53 J**	**0.43 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**5.2**	**4.5**	**4.9**	**6.9**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 UB	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.14 J**	1.0 UB	**0.19 J**	**0.17 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 UBJ	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UBJ	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**0.83 J**	**0.66 J**	**0.86 J**	1.0 UB
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**5.7**	**4.5**	**5.0**	**6.8**
Trichlorofluoromethane (Freon 11)	- -	**0.51 J**	**0.42 J**	**0.45 J**	**0.45 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 UJ	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	1.0 U
Total VOCs	- -	**13 J**	**12 J**	**13 J**	**15 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	46ML 08/31/09 220-9994-11	46ML 09/29/09 220-10260-3	46ML 10/30/09 220-10596-1	47MI 06/11/09 220-9348-6
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.49 J**	**0.45 J**	**0.45 J**	**1.3**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**6.3**	**6.1**	**6.8**	**15**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	**0.25 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UJ	5.0 U	5.0 UB	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 UJ	**0.13 J**	**0.18 J**
Chloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroform	7	**0.18 J**	**0.18 J**	**0.22 J**	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**0.90 J**	**0.97 J**	**0.99 J**	**3.3**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**6.4**	**6.0**	**6.5**	**3.9**
Trichlorofluoromethane (Freon 11)	- -	**0.42 J**	**0.39 J**	**0.40 J**	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	1.0 U
Total VOCs	- -	**15 J**	**14 J**	**15 J**	**25 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	47ML 06/11/09 220-9348-7	48MI 01/05/10 220-11239-11	48ML 01/05/10 220-11239-10	49MI 01/05/10 220-11239-8
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.70 J**	**0.22 J**	1.0 U	**0.64 J [0.61 J]**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1-Dichloroethene	5	**0.22 J**	1.0 U	1.0 U	1.0 U [1.0 U]
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U [3.0 U]
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethene (cis)	5	**17**	**3.2**	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethene (trans)	5	**0.19 J**	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UB	5.0 UB	1.0 UBJ [5.0 UB]
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ [1.0 UJ]
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chlorodifluoromethane (Freon 22)	- -	**0.15 J**	1.0 U	1.0 U	1.0 U [1.0 U]
Chloroethane	5	**0.55 J**	1.0 U	1.0 U	1.0 U [1.0 U]
Chloroform	7	1.0 UB	**0.65 J**	1.0 U	1.0 U [1.0 U]
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	**0.23 J [0.23 J]**
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 UB [2.0 UB]
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Tetrachloroethene (PCE)	5	**1.2**	**1.1**	1.0 U	**1.2 [1.2]**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Trichloroethene (TCE)	5	**9.3**	**4.3**	1.0 U	1.0 U [1.0 U]
Trichlorofluoromethane (Freon 11)	- -	**0.37 J**	**0.76 J**	1.0 U	1.0 U [1.0 U]
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Total VOCs	- -	**32 J**	**11 J**	**0.83 J**	**3.5 J [3.2 J]**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	49ML 01/05/10 220-11239-9	50MI 03/26/09 220-8544-4	50MI 12/30/09 220-11193-17	50ML 03/26/09 220-8544-5
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	NA	NA	NA
1,1,2,2-Tetrachloroethane	5	1.0 U	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	**17**	**11**	1.0 U
1,1,2-Trichloroethane	1	1.0 U	NA	NA	NA
1,1-Dichloroethane	5	1.0 U	NA	NA	NA
1,1-Dichloroethene	5	1.0 U	NA	NA	NA
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	NA	NA	NA
1,2,4-Trichlorobenzene	- -	1.0 U	NA	NA	NA
1,2-Dibromo-3-chloropropane	- -	3.0 U	NA	NA	NA
1,2-Dibromoethane	- -	1.0 U	NA	NA	NA
1,2-Dichlorobenzene	- -	1.0 U	NA	NA	NA
1,2-Dichloroethane	0.6	1.0 U	NA	NA	NA
1,2-Dichloroethene (cis)	5	1.0 U	**310 D**	**230 D**	**0.16 J**
1,2-Dichloroethene (trans)	5	1.0 U	NA	NA	NA
1,2-Dichloropropane	1	1.0 U	NA	NA	NA
1,3-Dichlorobenzene	- -	1.0 U	NA	NA	NA
1,3-Dichloropropene (cis)	0.4	1.0 U	NA	NA	NA
1,3-Dichloropropene (trans)	0.4	1.0 U	NA	NA	NA
1,4-Dichlorobenzene	- -	1.0 U	NA	NA	NA
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	NA	NA	NA
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB	NA	NA	NA
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	NA	NA	NA
Bromoform	50	1.0 U	NA	NA	NA
Bromomethane (Methyl bromide)	5	1.0 UJ	NA	NA	NA
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	NA	NA	NA
Chlorobenzene	5	1.0 U	NA	NA	NA
Chlorodifluoromethane (Freon 22)	- -	1.0 U	NA	NA	NA
Chloroethane	5	1.0 U	NA	NA	NA
Chloroform	7	1.0 U	NA	NA	NA
Chloromethane (Methyl chloride)	5	1.0 U	NA	NA	NA
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	NA	NA	NA
Dibromochloromethane	50	1.0 U	NA	NA	NA
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	NA	NA	NA
Ethylbenzene	5	1.0 U	NA	NA	NA
Isopropylbenzene (Cumene)	- -	1.0 U	NA	NA	NA
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	NA	NA	NA
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	NA	NA	NA
Methylene chloride	5	2.0 UB	NA	NA	NA
Styrene	5	1.0 U	NA	NA	NA
Tetrachloroethene (PCE)	5	1.0 U	**46**	**34**	1.0 U
Toluene	5	1.0 U	NA	NA	NA
Trichloroethene (TCE)	5	1.0 U	**66**	**54**	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	NA	NA	NA
Vinyl chloride	2	1.0 U	NA	NA	NA
Xylenes (total)	5	1.0 U	NA	NA	NA
Total VOCs	- -	**1.6 J**	**440**	**330**	**0.16 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	50ML 12/29/09 220-11193-12	51MI 01/07/10 220-11277-2	51ML 01/07/10 220-11277-1	ERM01 01/08/10 220-11277-8
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	NA	NA	NA	1.0 U
1,1,2,2-Tetrachloroethane	5	NA	NA	NA	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	1.0 U	**1.8**
1,1,2-Trichloroethane	1	NA	NA	NA	1.0 U
1,1-Dichloroethane	5	NA	NA	NA	1.0 U
1,1-Dichloroethene	5	NA	NA	NA	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	NA	NA	NA	1.0 U
1,2,4-Trichlorobenzene	- -	NA	NA	NA	1.0 U
1,2-Dibromo-3-chloropropane	- -	NA	NA	NA	3.0 U
1,2-Dibromoethane	- -	NA	NA	NA	1.0 U
1,2-Dichlorobenzene	- -	NA	NA	NA	1.0 U
1,2-Dichloroethane	0.6	NA	NA	NA	1.0 U
1,2-Dichloroethene (cis)	5	**0.28 J**	1.0 U	1.0 U	**68**
1,2-Dichloroethene (trans)	5	NA	NA	NA	**0.68 J**
1,2-Dichloropropane	1	NA	NA	NA	1.0 U
1,3-Dichlorobenzene	- -	NA	NA	NA	1.0 U
1,3-Dichloropropene (cis)	0.4	NA	NA	NA	1.0 U
1,3-Dichloropropene (trans)	0.4	NA	NA	NA	1.0 U
1,4-Dichlorobenzene	- -	NA	NA	NA	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	NA	NA	NA	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	NA	NA	NA	5.0 UBJ
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	NA	NA	NA	1.0 U
Bromoform	50	NA	NA	NA	1.0 U
Bromomethane (Methyl bromide)	5	NA	NA	NA	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	NA	NA	NA	1.0 U
Chlorobenzene	5	NA	NA	NA	1.0 U
Chlorodifluoromethane (Freon 22)	- -	NA	NA	NA	**71**
Chloroethane	5	NA	NA	NA	1.0 U
Chloroform	7	NA	NA	NA	1.0 U
Chloromethane (Methyl chloride)	5	NA	NA	NA	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	NA	NA	NA	1.0 U
Dibromochloromethane	50	NA	NA	NA	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	NA	NA	NA	1.0 U
Ethylbenzene	5	NA	NA	NA	1.0 U
Isopropylbenzene (Cumene)	- -	NA	NA	NA	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	NA	NA	NA	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	NA	NA	NA	1.0 U
Methylene chloride	5	NA	NA	NA	2.0 UB
Styrene	5	NA	NA	NA	1.0 U
Tetrachloroethene (PCE)	5	**0.24 J**	1.0 U	1.0 U	**7.4**
Toluene	5	NA	NA	NA	1.0 U
Trichloroethene (TCE)	5	**0.22 J**	1.0 U	1.0 U	**15**
Trichlorofluoromethane (Freon 11)	- -	NA	NA	NA	1.0 U
Vinyl chloride	2	NA	NA	NA	1.0 U
Xylenes (total)	5	NA	NA	NA	1.0 U
Total VOCs	- -	**0.74 J**	1.0 U	1.0 U	**170 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	ERM02 01/08/10 220-11277-7	ERM03 01/08/10 220-11277-6	ERM04 01/08/10 220-11277-9	ERM05 03/10/10 220-11577-33
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.72 J**	**0.51 J**	**2.8**	**0.67 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	**0.25 J**	**0.22 J**
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	**0.29 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	**0.26 J**
1,2-Dichloroethene (cis)	5	**44**	**34**	**100**	**110**
1,2-Dichloroethene (trans)	5	**0.81 J**	**0.31 J**	**3.8**	**0.73 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	2.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	1.0 U
Acetone (2-propanone)	50	5.0 UBJ	5.0 UBJ	5.0 UBJ	15 UB
Benzene	1	NA	NA	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	**1.2**
Carbon disulfide	- -	NA	NA	NA	1.0 UB
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**43**	**30**	**120**	**5.1**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 UB	1.0 U	1.0 UB	**0.37 J**
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	**1.1 J**
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Methyl Acetate	- -	NA	NA	NA	1.0 UJ
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 UJ
Methyl cyclohexane	- -	NA	NA	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	**0.34 J**	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**8.4**	**5.3**	**15**	**1.3**
Toluene	5	1.0 U	1.0 U	1.0 U	**0.82 J**
Trichloroethene (TCE)	5	**10**	**6.8**	**22**	**9.2**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	**0.16 J**
Total VOCs	- -	**110 J**	**78 J**	**270 J**	**150 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	ERM06 03/09/10 220-11577-26	ERM07 03/10/10 220-11577-32	ERM08 03/09/10 220-11577-27	EW1 06/13/06 213067-006
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**1.3**	1.0 U	**0.29 J**	**12**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**0.26 J**	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.17 J**	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	**0.22 J**	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**98**	1.0 U	**7.7**	**220 D**
1,2-Dichloroethene (trans)	5	**0.66 J**	1.0 U	1.0 U	**10**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	2.0 U	2.0 U	**3.1 J**	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Acetone (2-propanone)	50	5.2 UB	6.9 UB	35 UB	5.0 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	1.0 UB	1.0 U	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**76**	1.0 U	**0.24 J**	**9.0**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	**0.22 J**	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 UB	**0.43 J**	1.0 UJ	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Cyclohexane	- -	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	**0.13 J**	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Methyl Acetate	- -	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Methyl cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	**0.13 J**	1.0 U	**0.26 J**	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**3.2**	1.0 U	1.0 UB	**44**
Toluene	5	**0.59 J**	**0.69 J**	**0.66 J**	1.0 U
Trichloroethene (TCE)	5	**12**	1.0 U	**1.8**	**37**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	**0.19 J**	**0.19 J**	**0.68 J**	3.0 U
Total VOCs	- -	**200 J**	**9.0 J**	**51 J**	**330**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	EW1 06/25/09 220-9482-17	MW-40 05/26/06 212989-001	MW-41 05/26/06 212989-002	N10290 01/11/06 211852-003
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**11 J**	1.0 UJ	1.0 U	**4.0**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**0.32 J**	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.82 J**	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	**0.28 J**	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**130 DJ**	1.0 U	1.0 U	**120**
1,2-Dichloroethene (trans)	5	1.0 UB	1.0 U	1.0 U	**1.0**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	3.0 U	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	1.0 UJ	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 U	5.0 U
Benzene	1	NA	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**9.0 J**	1.0 UJ	1.0 U	**110**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 UB	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	1.0 U	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.15 J**	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 UJ	1.0 U	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 UJ	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	1.0 U	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	**0.22 J**	1.0 UJ	1.0 U	1.0 U
Methylene chloride	5	2.0 UBJ	2.0 U	2.0 U	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**41 J**	2.0 U	2.0 U	**21**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**34 J**	1.0 U	1.0 U	**27**
Trichlorofluoromethane (Freon 11)	- -	**0.20 J**	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	**0.64 J**	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	3.0 U	3.0 U
Total VOCs	- -	**230 J**	5.0 U	5.0 U	**280**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N10290 05/23/06 212940-008	N10290 01/11/10 220-11277-11	N1102 05/22/06 212940-003	N1102 01/11/10 220-11277-12
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**3.0**	**1.8**	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**130**	**68**	1.0 U	**0.44 J**
1,2-Dichloroethene (trans)	5	**1.0 J**	**0.54 J**	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UBJ	5.0 U	5.0 UBJ
Benzene	1	1.0 U	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**100**	**36**	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	**0.21 J**	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**19**	**10**	2.0 U	**0.15 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**26**	**15**	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**280 J**	**130 J**	5.0 U	**1.8 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N12450 05/22/06 212940-004	N12450 03/04/10 220-11577-12	N12999 04/03/09 220-8646-2	N12999 04/28/09 220-8899-22
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	1.0 U	**0.32 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1-Dichloroethene	5	1.0 U	1.0 U	**0.16 J**	1.0 UJ
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dichloroethene (cis)	5	1.0 U	1.0 U	1.0 U	**2.1 J**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 UJ
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 UJ
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 UJ
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
2-Butanone (Methyl ethyl ketone)	50	3.0 U	2.0 UJ	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	1.0 U	NA	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 UB	5.0 UJ
Benzene	1	1.0 U	1.0 U	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 UJ
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 UJ
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Carbon disulfide	- -	1.0 U	1.0 UB	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	**0.31 J**	1.0 UJ
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 UJ
Chloromethane (Methyl chloride)	5	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Chloropentafluoroethane (Freon 115)	- -	1.0 U	1.0 U	NA	NA
Cyclohexane	- -	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 UJ
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Methyl Acetate	- -	1.0 U	1.0 UJ	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 UJ	1.0 U	1.0 UJ
Methyl cyclohexane	- -	1.0 U	1.0 U	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Methylene chloride	5	2.0 U	2.0 UB	2.0 UB	2.0 UBJ
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Tetrachloroethene (PCE)	5	2.0 U	1.0 U	1.0 U	**0.33 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Trichloroethene (TCE)	5	1.0 U	1.0 U	1.0 U	**0.87 J**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 UJ
Xylenes (total)	5	3.0 U	1.0 U	1.0 U	1.0 UJ
Total VOCs	- -	5.0 U	**1.6 J**	**1.0 J**	**4.0 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N12999 06/25/09 220-9482-14	N12999 07/31/09 220-9767-8	N12999 09/24/09 220-10224-12	N12999 11/03/09 220-10596-14
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	**0.17 J**	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.43 J**	**0.14 J**	1.0 U	**0.29 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.13 J**	**0.43 J**	**0.21 J**	**0.19 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**2.8 J**	1.0 U	1.0 UB	**2.6**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 UJ
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UB	5.0 UB	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.16 J**	**0.98 J**	**0.15 J**	**0.21 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 UB	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**0.84 J**	1.0 UB	1.0 UB	**0.78 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**1.2 J**	**0.45 J**	**0.16 J**	**1.2**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	1.0 U
Total VOCs	- -	**8.5 J**	**2.0 J**	**0.52 J**	**5.3 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N13000 04/02/09 220-8597-8	N13000 04/28/09 220-8899-23	N13000 05/28/09 220-9195-1	N13000 06/25/09 220-9482-12
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 UJ	**0.13 J**	**0.14 J**
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.37 J**	1.0 UJ	**0.50 J**	**0.21 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.12 J**	**0.31 J**	**0.10 J**	**0.20 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 UJ	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**2.8**	1.0 UJ	**5.2**	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 UJ	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UJ	5.0 UB	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.21 J**	**0.61 J**	**0.11 J**	**0.73 J**
Chloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 UJ	1.0 U	1.0 UB
Chloromethane (Methyl chloride)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UBJ	2.0 UB	2.0 UBJ
Styrene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**0.81 J**	1.0 UJ	**1.1**	**0.13 J**
Toluene	5	1.0 U	1.0 UJ	1.0 U	1.0 UB
Trichloroethene (TCE)	5	**1.2**	**0.14 J**	**2.0**	**0.41 J**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 UJ	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Total VOCs	- -	**6.9 J**	**1.5 J**	**9.8 J**	**3.4 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N13000 07/31/09 220-9767-9	N13000 08/28/09 220-9994-9	N13000 09/24/09 220-10224-13	N13221 05/30/06 212989-009
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.31 J**	1.0 U	**0.36 J**	**7.0 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.12 J**	**0.18 J**	**0.12 J**	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**3.5**	1.0 U	**3.6**	**94**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	**1.0**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 UJ	5.0 U	5.0 U
Benzene	1	NA	NA	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.19 J**	**0.30 J**	**0.19 J**	**0.70 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	**0.13 J**	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	1.0 UJ
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U*	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 UJ	1.0 UJ
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	1.0 UB	1.0 U	1.0 UB	**23**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**1.4**	**0.14 J**	**1.5**	**35**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	**0.50 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	3.0 U
Total VOCs	- -	**5.5 J**	**0.62 J**	**5.9 J**	**160 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N13221 06/10/09 220-9348-2	N13221 09/15/09 220-10118-1	N13226 05/30/06 212989-010	N13266 06/10/09 220-9348-3
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**6.1**	**4.3**	**7.0 J**	**5.1**
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	**0.20 J**	1.0 U	1.0 U	**0.18 J**
1,1-Dichloroethene	5	**0.48 J**	**0.33 J**	1.0 U	**0.42 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**88**	**58**	**87**	**73**
1,2-Dichloroethene (trans)	5	**1.2**	**0.77 J**	**1.0**	**0.99 J**
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	1.0 U	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UBJ	5.0 U	5.0 UB
Benzene	1	NA	NA	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.70 J**	1.0 UB	**0.60 J**	**0.61 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 UB	**0.32 J**	1.0 U	1.0 UB
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	**0.18 J**	**0.20 J**	1.0 U	**0.20 J**
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	1.0 UJ	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	**0.18 J**	1.0 UJ	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**19**	**14**	**21**	**17**
Toluene	5	**0.17 J**	1.0 U	1.0 U	**3.3**
Trichloroethene (TCE)	5	**26**	**19**	**34**	**23**
Trichlorofluoromethane (Freon 11)	- -	**0.41 J**	**0.30 J**	**0.40 J**	**0.35 J**
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	3.0 U	1.0 U
Total VOCs	- -	**140 J**	**97 J**	**150 J**	**130 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N2169 06/15/06 213067-011	N2169 04/02/09 220-8597-5	N2169 04/24/09 220-8899-9	N2169 06/04/09 220-9271-18
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 UJ	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	1.0 U	**0.13 J**	**0.28 J**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 UJ	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	NA	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 UJ	5.0 UB
Benzene	1	1.0 U	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 UJ	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 UJ	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 UJ	1.0 UJ
Carbon disulfide	- -	1.0 U	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 UJ	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Methyl Acetate	- -	1.0 U	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 UJ	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Methylene chloride	5	2.0 U	2.0 UB	2.0 UBJ	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Tetrachloroethene (PCE)	5	2.0 U	1.0 U	1.0 UJ	**0.17 J**
Toluene	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Trichloroethene (TCE)	5	1.0 U	1.0 U	1.0 UJ	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 UJ	**0.11 J**
Xylenes (total)	5	3.0 U	1.0 U	1.0 UJ	1.0 U
Total VOCs	- -	5.0 U	**1.7 J**	**0.57 J**	**2.0 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N2169 06/19/09 220-9430-4	N2169 08/03/09 220-9767-16	N2169 08/31/09 220-9994-14	N2169 09/29/09 220-10260-1
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 UB	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**0.19 J**	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UB	**0.33 J**	5.0 U
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 UJ
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 UJ
Methylene chloride	5	2.0 UBJ	2.0 UB	2.0 UB	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	1.0 UB	1.0 UB	1.0 U	1.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	1.0 U
Total VOCs	- -	**1.8 J**	5.0 U	**0.33 J**	5.0 U

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N2169 11/04/09 220-10596-7	N2576 06/09/06 213025-020	N3905 06/05/06 213025-004	N4243 06/07/06 213025-012
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	**1.0**	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	**18**	1.0 U	**0.80 J**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 UJ	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	3.0 U	3.0 U	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	1.0 U	1.0 U	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 U	5.0 U
Benzene	1	NA	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	1.0 U	1.0 U	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	1.0 U	1.0 U	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	1.0 U	1.0 U	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	3.0 UB	2.0 U	2.0 U	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	1.0 U	**4.0**	2.0 U	**0.40 J**
Toluene	5	1.0 U	1.0 U	**0.40 J**	1.0 U
Trichloroethene (TCE)	5	1.0 U	**6.0**	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	3.0 U	3.0 U	3.0 U
Total VOCs	- -	5.0 U	**29**	**0.40 J**	**1.2 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N5099 04/02/09 220-8597-7	N5099 04/28/09 220-8899-21	N5099 05/28/09 220-9195-2	N5099 06/25/09 220-9482-13
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 UJ	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**0.27 J**	**0.13 J**	**0.28 J**	**0.26 J**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 UJ	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 UJ	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UJ	5.0 UB	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	**0.12 J**	1.0 UJ	1.0 U	**0.13 J**
Chlorobenzene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 UJ	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UBJ	2.0 UB	2.0 UBJ
Styrene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	1.0 U	1.0 UJ	**0.11 J**	1.0 U
Toluene	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Trichloroethene (TCE)	5	**0.26 J**	**0.19 J**	**0.33 J**	**0.32 J**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 UJ	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Total VOCs	- -	**1.6 J**	**0.79 J**	**1.4 J**	**2.4 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N5099 07/31/09 220-9767-10	N5099 08/28/09 220-9994-8	N5099 09/25/09 220-10233-1	N5099 11/03/09 220-10596-15
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**0.41 J**	**0.42 J**	**0.30 J**	**0.38 J**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 UJ
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	NA
Acetone (2-propanone)	50	5.0 UB	5.0 UJ	5.0 U	5.0 UB
Benzene	1	NA	NA	NA	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 UB
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	1.0 UB	**0.16 J**	1.0 UB	**0.17 J**
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	**0.43 J**	**0.46 J**	**0.35 J**	**0.46 J**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	1.0 U
Total VOCs	- -	**0.84 J**	**1.0 J**	**0.65 J**	**1.0 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N5535 04/26/06 212727-021	N5535 06/09/06 213025-019	N5535 06/28/06 213191-012	N5535 07/26/06 213336-011
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1-Dichloroethene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2,4-Trichlorobenzene	- -	1.0 UJ	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U [3.0 U]
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethene (cis)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
2-Butanone (Methyl ethyl ketone)	50	3.0 U	3.0 U	3.0 U	3.0 U [3.0 U]
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Acetone (2-propanone)	50	5.0 U	5.0 U	5.0 U	5.0 U [5.0 U]
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Carbon disulfide	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chlorodifluoromethane (Freon 22)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 UJ]
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Chloropentafluoroethane (Freon 115)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl Acetate	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Methylene chloride	5	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Tetrachloroethene (PCE)	5	2.0 U	2.0 U	2.0 U	2.0 U [2.0 U]
Toluene	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Trichloroethene (TCE)	5	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U [1.0 U]
Xylenes (total)	5	3.0 U	3.0 U	3.0 U	3.0 U [3.0 U]
Total VOCs	- -	5.0 U	5.0 U	5.0 U	5.0 U [5.0 U]

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N5535 07/07/09 220-9563-1	N5535 09/29/09 220-10260-2	N5535 11/04/09 220-10596-6	N5710 06/01/06 212989-021
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	**0.10 J**	1.0 U	1.0 U	**0.60 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U	1.0 U	1.0 U	**0.60 J**
1,2-Dichloroethene (trans)	5	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 UJ	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	NA	NA	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	NA	NA	NA	1.0 U
Acetone (2-propanone)	50	5.0 UB	5.0 U	5.0 UB	5.0 U
Benzene	1	NA	NA	NA	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Carbon disulfide	- -	NA	NA	NA	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.12 J**	1.0 UJ	1.0 U	**6.0**
Chloroethane	5	1.0 U	1.0 UJ	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	NA	NA	NA	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	NA	NA	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	NA	NA	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 UJ	1.0 U	1.0 U
Methylene chloride	5	2.0 UB	2.0 UB	2.0 UB	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	1.0 U	1.0 U	1.0 U	2.0 U
Toluene	5	1.0 U	**0.19 J**	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U	1.0 U	1.0 U	**1.0**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	1.0 U	1.0 U	1.0 U	3.0 U
Total VOCs	- -	**0.22 J**	**0.19 J**	5.0 U	**8.2 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N7560 06/09/06 213025-021	N8038 06/08/06 213025-016	N8255 06/10/06 213067-004	N8375D 06/26/06 213174-003
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**0.60 J**	**12**	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	**0.60 J**	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**14**	**400 D**	1.0 U	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U	**3.0**	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	3.0 U	3.0 U	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Acetone (2-propanone)	50	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	1	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**3.0**	**2.0**	1.0 U	**83**
Chloroethane	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U	**0.80 J**	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	1.0 U	1.0 UJ	1.0 U
Cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 U	2.0 U	2.0 U
Styrene	5	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**3.0**	**67**	2.0 U	2.0 U
Toluene	5	1.0 U	1.0 U	1.0 U	**0.40 J**
Trichloroethene (TCE)	5	**3.0**	**110**	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	**2.0**	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	3.0 U	3.0 U	3.0 U
Total VOCs	- -	**24 J**	**600 J**	5.0 U	**83 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	N8456 06/10/06 213067-005	POOL 07/07/06 213260-002	POOL 07/07/09 220-9563-2	Q3247 07/07/06 213260-001
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 UJ
1,2,4-Trichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U [3.0 U]	3.0 U	3.0 U	3.0 UJ
1,2-Dibromoethane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (trans)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	1	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U [3.0 U]	3.0 UJ	NA	3.0 U
4-Methyl-2-pentanone (MIBK)	- -	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Acetone (2-propanone)	50	5.0 U [5.0 U]	5.0 U	5.0 UB	5.0 UJ
Benzene	1	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Bromodichloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromoform	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Carbon tetrachloride	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chlorobenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**8.0 [9.0]**	1.0 U	1.0 U	1.0 UJ
Chloroethane	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloroform	7	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 UJ [1.0 U]	1.0 U	NA	1.0 UJ
Cyclohexane	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Ethylbenzene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U [1.0 U]	1.0 U	NA	1.0 U
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U [1.0 U]	**2.0**	**0.92 J**	1.0 U
Methylene chloride	5	2.0 U [1.3 U]	2.0 U	2.0 UB	2.0 U
Styrene	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	2.0 U [2.0 U]	2.0 U	1.0 U	2.0 U
Toluene	5	**0.40 J [0.40 J]**	1.0 U	1.0 U	1.0 U
Trichloroethene (TCE)	5	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	- -	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	1.0 U [1.0 U]	1.0 U	1.0 U	1.0 U
Xylenes (total)	5	3.0 U [3.0 U]	3.0 U	1.0 U	3.0 U
Total VOCs	- -	**8.4 J [9.4 J]**	**2.0**	**0.92 J**	5.0 U

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	RW-01RD 06/13/06 213067-008	RW-01RD 06/25/09 220-9482-16	RW-01RS 06/13/06 213067-007	RW-01RS 06/25/09 220-9482-15
Parameters (units in • g/l)					
VOCs					
1,1,1-Trichloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	**0.26 J**
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**11**	**11 J**	**22 [22]**	**17 J**
1,1,2-Trichloroethane	1	1.0 U	**0.11 J**	1.0 U [1.0 U]	1.0 U
1,1-Dichloroethane	5	1.0 U	**0.36 J**	1.0 U [1.0 U]	**0.43 J**
1,1-Dichloroethene	5	1.0 U	**1.6 J**	**3.0 [3.0]**	**3.4 J**
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 UJ	3.0 U	3.0 UJ [3.0 UJ]	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U	**2.0 [2.0]**	**1.1 J**
1,2-Dichloroethane	0.6	1.0 U	**0.27 J**	1.0 U [1.0 U]	**0.24 J**
1,2-Dichloroethene (cis)	5	**220 D**	**140 J**	**630 D [610 D]**	**300 DJ**
1,2-Dichloroethene (trans)	5	**21**	1.0 UB	**1.0 [1.0]**	1.0 UB
1,2-Dichloropropane	1	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U	1.0 U [1.0 U]	**0.20 J**
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA	3.0 U [3.0 U]	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA	1.0 U [1.0 U]	NA
Acetone (2-propanone)	50	5.0 U	5.0 UB	5.0 U [5.0 U]	5.0 UB
Benzene	1	1.0 U	NA	**0.50 J [0.50 J]**	NA
Bromodichloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromoform	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Carbon disulfide	- -	1.0 U	NA	1.0 U [1.0 U]	NA
Carbon tetrachloride	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorobenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**2.0**	**2.4 J**	**1.0 [1.0 M]**	**1.9 J**
Chloroethane	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloroform	7	1.0 U	1.0 UB	1.0 U [1.0 U]	1.0 UB
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 UJ	NA	1.0 UJ [1.0 UJ]	NA
Cyclohexane	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	**0.15 J**	1.0 UJ [1.0 UJ]	**0.78 J**
Ethylbenzene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl Acetate	- -	1.0 U	NA	1.0 U [1.0 U]	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Methyl cyclohexane	- -	1.0 U	NA	1.0 U [1.0 U]	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	**0.18 J**	1.0 U [1.0 U]	**0.18 J**
Methylene chloride	5	2.0 U	2.0 UBJ	2.0 U [2.0 U]	2.0 UBJ
Styrene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Tetrachloroethene (PCE)	5	**44**	**39 J**	**33 [32]**	**22 J**
Toluene	5	1.0 U	1.0 U	1.0 U [1.0 U]	1.0 U
Trichloroethene (TCE)	5	**54**	**41 J**	**29 [30]**	**18 J**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	**0.25 J**	1.0 U [1.0 U]	**0.10 J**
Vinyl chloride	2	1.0 U	**0.11 J**	**76 [75]**	**71 J**
Xylenes (total)	5	3.0 U	1.0 U	3.0 U [3.0 U]	1.0 U
Total VOCs	- -	**350**	**240 J**	**800 J [780 J]**	**440 J**

Footnotes on Last Page

Table 3-3
Results of VOC Analysis of Groundwater Samples
Collected in April /May 2006 and June 2009/January 2010 at and in the Vicinity of the Site
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Location ID: Date Collected: Lab Sample ID:	Great Neck ARARs	RW-02 06/08/06 213025-015	RW-02 01/11/10 220-11277-15
Parameters (units in • g/l)			
VOCs			
1,1,1-Trichloroethane	5	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	5	1.0 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	5	**12**	**0.31 J**
1,1,2-Trichloroethane	1	1.0 U	1.0 U
1,1-Dichloroethane	5	1.0 U	1.0 U
1,1-Dichloroethene	5	1.0 U	1.0 U
1,1-Difluoroethane (Freon 152a)	- -	1.0 U	1.0 U
1,2,4-Trichlorobenzene	- -	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	- -	3.0 U	3.0 U
1,2-Dibromoethane	- -	1.0 U	1.0 U
1,2-Dichlorobenzene	- -	1.0 U	1.0 U
1,2-Dichloroethane	0.6	1.0 U	1.0 U
1,2-Dichloroethene (cis)	5	**180 D**	**3.2**
1,2-Dichloroethene (trans)	5	**0.90 J**	1.0 U
1,2-Dichloropropane	1	1.0 U	1.0 U
1,3-Dichlorobenzene	- -	1.0 U	1.0 U
1,3-Dichloropropene (cis)	0.4	1.0 U	1.0 U
1,3-Dichloropropene (trans)	0.4	1.0 U	1.0 U
1,4-Dichlorobenzene	- -	1.0 U	1.0 U
2,2-Dichloro-1,1,1-trifluoroethane (Freon 123)	- -	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone)	50	3.0 U	NA
4-Methyl-2-pentanone (MIBK)	- -	1.0 U	NA
Acetone (2-propanone)	50	5.0 U	5.0 UBJ
Benzene	1	1.0 U	NA
Bromodichloromethane	50	1.0 U	1.0 U
Bromoform	50	1.0 U	1.0 U
Bromomethane (Methyl bromide)	5	1.0 U	1.0 U
Carbon disulfide	- -	1.0 U	NA
Carbon tetrachloride	5	1.0 U	1.0 U
Chlorobenzene	5	1.0 U	1.0 U
Chlorodifluoromethane (Freon 22)	- -	**0.80 JM**	1.0 UB
Chloroethane	5	1.0 U	1.0 U
Chloroform	7	1.0 U	1.0 U
Chloromethane (Methyl chloride)	5	1.0 U	1.0 U
Chloropentafluoroethane (Freon 115)	- -	1.0 U	NA
Cyclohexane	- -	1.0 U	1.0 U
Dibromochloromethane	50	1.0 U	1.0 U
Dichlorodifluoromethane (Freon 12)	- -	1.0 U	1.0 U
Ethylbenzene	5	1.0 U	1.0 U
Isopropylbenzene (Cumene)	- -	1.0 U	1.0 U
Methyl Acetate	- -	1.0 U	NA
Methyl Butyl Ketone (2-Hexanone)	50	1.0 U	1.0 U
Methyl cyclohexane	- -	1.0 U	NA
Methyl tert-Butyl Ether (MTBE)	- -	1.0 U	1.0 U
Methylene chloride	5	2.0 U	2.0 UB
Styrene	5	1.0 U	1.0 U
Tetrachloroethene (PCE)	5	**32**	**2.3**
Toluene	5	**12**	1.0 U
Trichloroethene (TCE)	5	**48**	**1.4**
Trichlorofluoromethane (Freon 11)	- -	1.0 U	1.0 U
Vinyl chloride	2	1.0 U	1.0 U
Xylenes (total)	5	3.0 U	1.0 U
Total VOCs	- -	**290 J**	**9.3 J**

Footnotes on Last Page

Table 4-1
Potential Chemical-, Action-, and Location-Specific Standards, Criteria, and Guidance
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/ Remedial Action
Chemical-Specific Standards, Criteria, and Guidance (SCGs)				
Clean Water Act (CWA) Ambient Water Quality Criteria	40 Code of Federal Regulations (CFR) Part 131; U.S. Environmental Protection Agency (USEPA) 440/5-86/001 "Quality Criteria for Water - 1986", superseded by EPA-822-R-02-047 "National Recommended Water Quality Criteria: 2002"	S	Criteria for protection of aquatic life and/or human health depending on designated water use.	Potentially applicable depending on designated groundwater use.
CWA Section 136	40 CFR 136	G	Identifies guidelines for test procedures for the analysis of pollutants.	Potentially applicable depending on designated groundwater use.
CWA Section 404	33 United States Code (USC) 1344	S	Regulates discharges to surface water or ocean, indirect discharges to Publicly Owned Treatment Works (POTW), and discharge of dredged or fill material into waters of the U.S. (including wetlands).	Potentially applicable for remedial activities that include dredging or capping and/or the treatment of water generated during excavation and dewatering activities.
National Primary Drinking Water Standards	40 CFR Part 141	S	Establishes maximum contaminant levels (MCLs), which are health-based standards for public water supply systems.	Potentially applicable if an action involves future use of groundwater as a public supply source.
Resource Conservation and Recovery Act (RCRA)-Regulated Levels for Toxicity Characteristic Leaching Procedure (TCLP) Constituents	40 CFR Part 261	S	These regulations specify the TCLP constituent levels for identification of hazardous wastes that exhibit the characteristic of toxicity.	Waste materials may be sampled and analyzed for TCLP constituents prior to disposal to determine if the materials are hazardous based on the characteristic of toxicity.
Universal Treatment Standards/Land Disposal Restrictions (UTS/LDRs)	40 CFR Part 268	S	Identifies hazardous wastes for which land disposal is restricted and provides a set of numerical constituent concentration criteria at which hazardous waste is restricted from land disposal (without treatment).	Applicable if waste material is determined to be hazardous and is designated for off-site land disposal.
Environmental Remediation Programs	6 New York Codes, Rules, and Regulations (NYCRR) Part 375	S	Provides an outline for the development and execution of remedial programs.	Applicable for site remediation.

Table 4-1
Potential Chemical-, Action-, and Location-Specific Standards, Criteria, and Guidance
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/ Remedial Action
New York State Department of Environmental Conservation (NYSDEC) Ambient Water Quality Standards and Guidance Values	Division of Water Technical and Operational Guidance Series 1.1.1 (6/98, revised 4/00)	G	Provides a compilation of ambient water quality standards and guidance values for toxic and nonconventional pollutants for use in the NYSDEC programs.	These standards and guidance values will be considered in evaluating groundwater and surface water quality.
Identification and Listing for Hazardous Wastes	6 NYCRR Part 371	S	Outlines criteria for determining if a solid waste is a hazardous waste and is subject to regulation under 6 NYCRR Parts 371-376.	Applicable for determining if waste material generated during implementation of remedial activities is a hazardous waste. These regulations do not set cleanup standards, but are considered when developing remedial alternatives.
New York State Surface Water and Groundwater Quality Standards	6 NYCRR Part 703	S	Establishes quality standards for surface water and groundwater.	Applicable for assessing water quality at the site during remedial activities.
Occupational Safety and Healthy Act (OSHA) General Industry Standards	29 CFR Part 1910	S	These regulations specify the 8-hour time-weighted average concentration for worker exposure to various compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 1910.120.	Proper respiratory equipment will be worn if it is not possible to maintain airborne concentrations of Constituents of Concern (COCs) in the breathing zone below required concentrations. Appropriate training requirements will be met for remedial workers.
OSHA Safety and Health Standards	29 CFR Part 1926	S	These regulations specify the type of safety equipment and procedures to be followed during site remediation.	Appropriate safety equipment will be used and appropriate procedures will be followed during remedial activities.
OSHA Recordkeeping, Reporting and Related Regulations	29 CFR Part 1904	S	These regulations outline OSHA recordkeeping and reporting requirements for an employer.	These regulations apply to the company(s) contracted to install, operate, and maintain remedial actions at hazardous waste sites.
RCRA Preparedness and Prevention	40 CFR Part 264.30 - 264.31	S	These regulations outline requirements for safety equipment and spill control when treating, handling, and/or storing hazardous wastes.	Safety and communication equipment will be used at the site as necessary. Local authorities will be familiarized with the site.
RCRA Contingency Plan and Emergency Procedures	40 CFR Part 264.50 - 264.56	S	Provides requirements for outlining emergency procedures to be used following explosions, fires, and other emergency situations when storing hazardous wastes.	Emergency and contingency plans will be developed and implemented during remedial design. Copies of the plan will be kept on site.
CWA Discharge to Water of the U.S., and Section 404	40 CFR Parts 403, and 230 Section 404 (b) (1); 33 USC 1344	S	Establishes site-specific pollutant limitations and performance standards that are designed to protect surface water quality. Types of discharges regulated under the CWA include: indirect discharge to a POTW and discharge of dredged or fill material into waters of the U.S.	Potentially applicable to remedial activities.

Table 4-1
Potential Chemical-, Action-, and Location-Specific Standards, Criteria, and Guidance
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/ Remedial Action
RCRA General Standards	40 CFR Part 264.111	S	General performance standards requiring minimization of the need for further maintenance and control; minimization or elimination of post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products. Also requires decontamination or disposal of contaminated equipment, structures, and soils.	Decontamination activities will be conducted for remedial activities (if applicable) and any waste materials generated will be disposed of appropriately.
Standards Applicable to Transporters of Applicable Hazardous Waste- RCRA Section 3003	40 CFR Parts 170-179, 262, and 263	S	Establishes the responsibility of off-site transporters of hazardous waste in the handling, transportation, and management of the waste. Requires manifesting, recordkeeping, and immediate action in the event of a discharge.	These requirements will apply to any company(s) contracted to transport hazardous material from the site.
United States Department of Transportation Rules for Transportation of Hazardous Materials	49 CFR Parts 107 and 171.1 – 172.558	S	Outlines procedures for the packaging, labeling, manifesting, and transporting hazardous materials.	These requirements will apply to any company(s) contracted to transport hazardous material from the site.
Clean Air Act National Ambient Air Quality Standards	40 CFR Part 50	S	Establishes ambient air quality standards for protection of public health.	Remedial operations will be performed in a manner that minimizes the production of site-related COCs and particulate matter.
USEPA-Administered Permit Program: The Hazardous Waste Permit Program	RCRA Section 3005; 40 CFR Part 270.124	S	Covers the basic permitting, application, monitoring, and reporting requirements for off-site hazardous waste management facilities.	Any off-site facility accepting hazardous waste from the site must be properly permitted. Implementation of the site remedy will include consideration of these requirements.
New York Air Quality Classification System	6 NYCRR Part 256	S	Outlines the air quality classifications for different land uses and population densities.	Air quality classification system will be referenced during the treatment process design.
National Emission Standards for Hazardous Air Pollutants	40 CFR Part 61	S	Provides emission standards for hazardous air pollutants.	Proper designs on air emissions controls will be implemented to meet these regulations.
New York Permits and Certificates	6 NYCRR Part 201	S	Provides instructions and regulations for obtaining a permit to operate an air emission source. Also provides instructions on what to do in case of malfunction.	Permits are not required for remedial actions implemented at hazardous waste sites; however, documentation for relevant and appropriate permit conditions would be provided to the NYSDEC prior to and during implementation of this alternative.
New York Emissions Testing, Sampling, and Analytical Determinations	6 NYCRR Part 202	S	Outlines requirements for emissions testing for air emission sources. States that independent emissions tests can be ordered by the Commissioner of the NYSDEC.	Emissions from treatment procedure must be analyzed.
New York Regulations for General Process Emissions	6 NYCRR Part 212	S	Outlines the procedure of environmental rating. The Commissioner determines a rating of emissions based on sampling.	The Commissioner will issue an environmental rating for emissions based on this regulation.

Table 4-1
Potential Chemical-, Action-, and Location-Specific Standards, Criteria, and Guidance
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/ Remedial Action
Protection of Significant Deterioration of Air Quality (PSD)	40 CFR Part 51.2	S	New major stationary sources may be subject to PSD review (i.e., require best available control technology [BACT], lowest achievable detection limit [LAEL], and/or emission offsets).	If necessary, PSD procedures will be included in the remedial design/remedial action process. The procedures could be expanded to BACT and LAEL evaluations.
New York Air Quality Standards	6 NYCRR Part 257	S	Provides air quality standards for different chemicals (including those found at the site), particles, and processes.	Emissions from treatment processes will meet the air quality standards.
Land Disposal Facility Notice in Deed	40 CFR Parts 264/265	S	Establishes provisions for a deed notation for closed hazardous waste disposal units to prevent land disturbance by future owners.	The regulations are potentially applicable because closed areas may be similar to closed RCRA units.
Land Disposal Restrictions	40 CFR Part 268	S	Restricts land disposal of hazardous wastes that exceed specific criteria. Establishes UTSs to which hazardous waste must be treated prior to land disposal.	Waste materials that display the characteristic of hazardous waste or that are decharacterized after generation must be treated to 90% constituent concentration reduction capped at 10 times the UTS.
RCRA Subtitle C	40 U.S.C. Section 6901 et seq.;40 CFR Part 268	S	Restricts land disposal of hazardous wastes that exceed specific criteria. Establishes UTSs to which hazardous wastes must be treated prior to land disposal.	Potentially applicable to remedial activities that include disposal of generated waste material from the site.
NYSDEC's Monitoring Well Decommissioning Guidelines	National Priorities List (NPL) Site Monitoring Well Decommissioning dated May 1995	G	This guidance presents procedures for abandonment of monitoring wells at remediation sites.	This guidance is applicable for remedial alternatives that require the decommissioning of monitoring wells on site.
Guidelines for the Control of Toxic Ambient Air Contaminants	Division of Air Resources (DAR)-1 (Air Guide 1)	G	Provides guidance for the control of toxic ambient air contaminants in New York State and outlines the procedures for evaluating sources of air pollution.	This guidance may be applicable for remedial alternatives that result in certain air emissions.
New York Hazardous Waste Management System-General	6 NYCRR Part 370	S	Provides definitions of terms and general instructions for the Part 370 series of hazardous waste management.	Hazardous waste will be managed according to this regulation.
Identification and Listing of Hazardous Wastes	6 NYCRR Part 371	S	Outlines criteria for determining if a solid waste is a hazardous waste and is subject to regulation under Title 6 of NYCRR Parts 371-376.	Applicable for determining if solid waste generated during implementation of remedial activities are hazardous wastes. These regulations do not set cleanup standards, but are considered when developing remedial alternatives.
Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities	6 NYCRR Part 372	S	Provides guidelines relating to the use of the manifest system and its recordkeeping requirements. Applies to generators, transporters, and facilities in New York.	This regulation will apply to any company(s) contracted to do treatment work at the site or to transport or manage hazardous material generated at the site.
New York Regulations for Transportation of Hazardous Waste	6 NYCRR Part 372.3 a-d	S	Outlines procedures for the packaging, labeling, manifesting, and transporting of hazardous waste.	These requirements will be applicable to any company(s) contracted to transport hazardous material from the site.

Table 4-1
Potential Chemical-, Action-, and Location-Specific Standards, Criteria, and Guidance
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/ Remedial Action
Waste Transporter Permits	6 NYCRR Part 364	S	Governs the collection, transport, and delivery of regulated waste within New York.	Properly permitted haulers will be used if any waste materials are transported off site.
NYSDEC Technical and Administrative Guidance Memorandums (TAGMs)	NYSDEC TAGMs	G	TAGMs are NYSDEC guidance that will be considered during the remedial process.	Appropriate TAGMs will be considered during the remedial process.
New York Regulations for Hazardous Waste Management Facilities	6 NYCRR Part 373.1.1 - 373.1.8	S	Provides requirements and procedures for obtaining a permit to operate a hazardous waste treatment, storage, and disposal facility. Also lists contents and conditions of permits.	Any off-site facility accepting waste from the site must be properly permitted.
Land Disposal of Hazardous Waste	6 NYCRR Part 376	S	Restricts land disposal of hazardous wastes that exceed specific criteria.	New York defers to the USEPA for UTS/LDR regulations.
National Pollutant Discharge Elimination System Program Requirements, Administered Under New York State Pollution Discharge Elimination System (SPDES)	40 CFR Parts 122 Subpart B, 125, 301, 303, and 307(Administered under 6 NYCRR 750-758)	S	Establishes permitting requirements for point source discharges; regulates discharge of water into navigable waters including the quantity and quality of discharge.	Remedial activities may involve treatment/disposal of water. If so, water generated at the site will be managed in accordance with NYSDEC SPDES permit requirements.
Action-Specific SCGs				
NYSDEC Division of Environmental Remediation (DER) Numbered Technical Guidance Series Documents	DER-10 (Technical Guidance for Site Investigation and Remediation), DER-15 Presumptive/ Proven Remedial Technologies, and other applicable documents	G	DER-10: Provides guidance on NYSDEC-accepted site investigation and remediation processes. DER-15: Provides brief descriptions of generally accepted presumptive/proven remedial technologies.	Applicable to remedy evaluation process and site remedial activities.

Table 4-1
Potential Chemical-, Action-, and Location-Specific Standards, Criteria, and Guidance
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Regulation	Citation	Potential Standard (S) or Guidance (G)	Summary of Requirements	Applicability to the Remedial Design/ Remedial Action
Location-Specific SCGs				
New York Preservation of Historic Structures or Artifacts	Section 14.09	Applicable	Requirements for preservation of historical/archeological artifacts.	Activities must be completed to identify, preserve, and recover artifacts if the site has been identified as containing significant historical artifacts.
Local Building Permits	N/A	S	Local authorities may require a building permit for any permanent or semipermanent structure, such as an on-site water treatment system building.	Substantive provisions are potentially applicable to remedial activities that require construction of permanent or semipermanent structures.

Table 4-2
Standards, Criteria, and Guidance Values
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility
Great Neck, New York

Compound	Standard Value (µg/L)	Guidance Value (µg/L)	USEPA MCL (µg/L)
COCs			
cis-1,2-Dichloroethene	5		70
trans-1,2-Dichloroethene	5		100
Trichloroethene	5		5
Tetrachloroethene	5	0.7 (SW)	5
Freon 113 (1,1,2-Trichloro-1,2,2-Trifluoroethane)	5		
Potential COCs			
1,1-Dichloroethene	5	0.7 (SW)	7
1,1-Dichloroethane	5		
Chloroform	7		
Toluene	5		1,000
Other VOCs			
1,1,1,2-Tetrachloroethane	5		
1,1,1-Trichloroethane	4		
1,1,2,2-Tetrachloroethane	5	0.2 (SW)	
1,1,2-Trichloroethane	1		
1,1-Dichloropropene	5		
1,2-Dichlorobenzene	3		
1,2,3-Trichlorobenzene	5		
1,2,3-Trichloropropane	0.04		
1,2,4-Trichlorobenzene	5		
1,2,4-Trimethylbenzene	5		
1,2-Dichloroethane	0.6		
1,2-Dichloropropane	1		
1,3-Dichloropropene	0.4		
1,3,5-Trimethylbenzene	5		
1,3-Dichloropropane	5		
2,2-Dichloropropane	5		
2-Chloroethyl vinyl ether			
2-Chlorotoluene	5		
2-Hexanone		50	
4-Chlorotoluene	5		
4-Methyl-2-pentanone			
Acetone		50	
Acrolein	5		
Acrylonitrile	5	0.07 (SW)	
Allyl chloride	5		
Benzene	1		
Bromobenzene	5		
Bromochloromethane	5		
Bromodichloromethane		50	
Bromoform		50	
Bromomethane	5		
Carbon disulfide			
Carbon tetrachloride	5	0.4 (SW)	
Chlorobenzene	5		
Chloroethane	5		

Table 4-2
Standards, Criteria, and Guidance Values
Draft Feasibility Study, Operable Unit 2
Former Unisys Facility
Great Neck, New York

Compound	Standard Value (µg/L)	Guidance Value (µg/L)	USEPA MCL (µg/L)
Dibromochloromethane		50	
Dibromomethane	5		
Dichlorodifluoromethane (Freon 12)	5		
Di-isopropyl ether			
Diethyl ether			
Ethanol			
Ethyl tert-butyl ether			
Ethylbenzene	5		
Ethyl methacrylate	50		
Hexachlorobutadiene	0.5		
Isopropylbenzene	5		
Methyl ethyl ketone	50		
Methyl methacrylate	50		
Methyl tert-butyl ether (MTBE)			
Methylene chloride	5		
Naphthalene		10	
n-Butylbenzene	5		
n-Propylbenzene	5		
p-Isopropyltoluene	5		
sec-Butylbenzene	5		
Styrene	5		
trans-1,4-Dichloro-2-butene	5		
Tert-amyl methyl ether (TAME)			
tert-Butylbenzene	5		
Tetrahydrofuran		50	
trans-1,2-Dichloroethene	5		
Freon 11 (Trichlorofluoromethane)	5		
Vinyl chloride	2		
Xylenes (total)	5		
m,p-Xylene			
o-Xylene			

Notes:

COCs = Constituents of concern

MCL = Maximum contaminant level

SW = Surface Water

USEPA = United States Environmental Protection Agency

VOC = Volatile organic compound

µg/L = Micrograms per liter

New York State Department of Environmental Conservation, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. http://www.dec.ny.gov/docs/water_pdf/togs111.pdf

USEPA, Drinking Water Contaminants. http://www.epa.gov/safewater/contaminants/index.html

In the text, the term "SCG value(s)" is used to indicate the groundwater cleanup goal. The guidance value is used for all site-related COCs and potential COCs.

Table 5-1
Identification and Initial Screening of General Response Actions and Process Options
Feasibility Study, Operable Unit 2
Lockheed Martin Corporation, Great Neck, New York

General Response Action	Technology	Process Options	Description	Comments	General Screening
No Action	None	No Action	Present conditions are allowed to continue.	No Action retained for baseline purposes. A true No Action option cannot be implemented because several remedial systems are already in place and are operating on and off site.	Retained
Administrative Actions	Institutional Controls	Fencing	Barrier used to restrict site access.	Fencing is already in place at the site and would not prevent plume migration or access to groundwater constituents of concern (COCs).	Not retained
		Deed Restrictions	Administrative action used to restrict or control future groundwater use.	Includes wellhead treatment for impacted purveyor wells.	Retained
		Groundwater Monitoring	Involves sampling and analysis of media to assess plume migration and need for, or progress of, remediation.		Retained
		Alternative Water Supply	Involves replacing site-related COC-affected groundwater supply with an alternative water supply for end user/purveyor.	This option is not retained because of the number of large-volume users and lack of an alternate water supply.	Not retained
		Wellhead Treatment	Wellhead treatment at purveyor wells to prevent public exposure to site-related COCs.	Wellhead treatment systems are already installed and are in operation at select purveyor wells.	Retained
Containment	Vertical Barriers	Slurry Walls	Clay wall used to restrict horizontal migration of site-related COC-affected groundwater.	Aquifer is too deep to implement an effective vertical barrier or permeable trench. Unrestricted groundwater flow exists to a depth of several hundred feet.	Not retained
	Groundwater Pumping with Treatment	Extraction Wells	This technology uses groundwater extraction wells to contain the plume.	The plume is large; therefore, a network of groundwater pumping wells may be needed.	Retained
Removal	Extraction	Extraction Wells	Discrete pumping wells used to remove site-related COC-affected water from the aquifer.	The plume is large; therefore a network of groundwater pumping wells may be needed.	Retained
		Collection Trench	A permeable trench used to intercept and collect groundwater.	Aquifer is too deep to implement an effective vertical barrier or permeable trench. Unrestricted groundwater flow exists to a depth of several hundred feet.	Not retained

Table 5-1
Identification and Initial Screening of General Response Actions and Process Options
Feasibility Study, Operable Unit 2
Lockheed Martin Corporation, Great Neck, New York

General Response Action	Technology	Process Options	Description	Comments	General Screening
Re-Use / Discharge	Beneficial Re-Use	Process Water / Potable Water	On-site or off-site re-use of groundwater from which the site-related COCs have been removed.	No nearby facilities use process water, possible beneficial re-use by water purveyors.	Retained
	Surface Discharge	Direct Discharge (State Pollutant Discharge Elimination System [SPDES])	Discharge of collected/treated water to a local surface water.	No local surface water bodies exist in or around OU-2.	Not retained
		Discharge to Publicly Owned Treatment Works (POTWs)	Discharge of collected/treated water to a POTW.	Collected/treated water flow rate is too large for discharge to a POTW.	Not retained
		Off-site Treatment Facility	Treatment and disposal of hazardous or nonhazardous materials at permitted off-site facilities.	Volume of groundwater requiring disposal is too large to effectively transport and treat off site.	Not retained
	Subsurface Discharge	Injection	Technology uses injection, spray irrigation, or infiltration to dispose of collected/treated groundwater underground or to recharge basins.		Retained
***Ex-Situ* Treatment**	Physical	Volatilization	Technology contacts site-related COC-affected groundwater with air to remove volatile compounds. Air or steam stripping methods are typically employed.	Technology generally requires off-gas treatment.	Retained
		Adsorption	Adsorption of site-related COCs onto activated carbon, resins, or activated alumina. Can be used as both a vapor treatment and groundwater treatment technology.	Adsorptive media also include potassium permanganate-impregnated zeolite for treatment of vinyl chloride and other volatile organic compounds (VOCs) that do not adsorb well to granular activated carbon.	Retained
	Biological	Aerobic/Anaerobic	Technology uses suspended growth facultative process in pond or basin employing long detention times and aerobic/anaerobic biomass to decompose organic site-related COCs.	This technology is impractical because of the large volume of water that requires treatment, which would require a very large land area.	Not retained
		Anaerobic	Suspended growth or fixed film process employing anaerobic biomass to decompose organic site-related COCs.	This technology is impractical because of the large volume of water that requires treatment, which would require a very large land area.	Not retained
	Chemical	Advanced Oxidation	This technology uses strong oxidizers such as ultraviolet (UV) light, ozone, peroxide, chlorine, or permanganate to oxidize materials. Typically, hydrogen peroxide (and/or ozone) with UV light is used for groundwater remediation.		Retained

Table 5-1
Identification and Initial Screening of General Response Actions and Process Options
Feasibility Study, Operable Unit 2
Lockheed Martin Corporation, Great Neck, New York

General Response Action	Technology	Process Options	Description	Comments	General Screening
***In-Situ* Treatment**	Chemical	In-Well Air Stripping	Innovative technology that uses a double-cased well(s) to create an "air lift pump effect" within the well to strip site-related COCs from groundwater.	This technology has a limited treatment radius that would require many stripping wells and off-gas treatment.	Retained
		In-Situ Chemical Oxidation (ISCO)	ISCO is a treatment technology where chemical oxidants (e.g., ozone, permanganate, persulfate, activated hydrogen peroxide [Fenton's reagent]) are injected into groundwater to destroy organic site-related COCs.	This aggressive treatment technology is usually applied to plume "hot spots." Adequate delivery and contact of oxidant with target COCs is required. Secondary water quality effects are expected and must be managed and monitored.	Retained
	Biological/ Chemical/ Physical	Permeable Reactive Barrier (PRB) with Zero Valent Iron (ZVI)	PRB technology consists of emplacing (using conventional trench excavation or horizontal hydraulic fracture placement) a reactive material. Solid ZVI filings provide sufficient chemical reduction capacity to abiotically reduce site-related COCs as they pass through the strategically placed reactive media, therefore preventing further downgradient movement of the COCs.	This technology is associated with minimal operation and maintenance (O&M) requirements and minimal impacts on site activities once the PRB is installed. There is limited experience with barrier installation at depths greater than 120 feet below ground surface. Installation can be expensive so may not be an appropriate technology for large plumes.	Retained
		Enhanced Reductive Dechlorination (ERD)	This technology involves the injection of electron donors and nutrients into groundwater to stimulate dechlorinating microorganisms to destroy chlorinated VOCs.	This technology may require numerous injection wells and significant volumes of electron donor. ERD may require the injection of dechlorinating microorganisms (bioaugmentation) to achieve complete dechlorination.	Retained
		Air Sparging with Soil Vapor Extraction (SVE)	This technology involves subsurface air injection into the saturated zone, resulting in a phase transfer of VOCs from the dissolved to the vapor phase. Vapors are recovered by SVE, which creates a negative pressure in the unsaturated zone through a series of extraction wells to capture vapors and control the vapor plume migration.	The large saturated interval requiring treatment will likely require a sophisticated network of nested vertical or horizontal air sparge points. This technology requires near continuous operation of air sparging and SVE compressors/ blowers, the installation of conveyance piping over a large footprint , and the installation of an off-gas treatment system.	Retained

Table 5-1
Identification and Initial Screening of General Response Actions and Process Options
Feasibility Study, Operable Unit 2
Lockheed Martin Corporation, Great Neck, New York

General Response Action	Technology	Process Options	Description	Comments	General Screening
***In-Situ* Treatment (cont.)**	Biological/ Chemical/ Physical (cont.)	Phytoremediation	This technology uses plants and their associated rhizospheric microorganisms to remove or degrade contaminants in groundwater.	This technology is confined to the area covered by the depths of the roots. Slow growth rate and limited biomass result in long treatment times.	Retained
		Monitored Natural Attenuation	This technology uses passive or enhanced *in-situ* biodegradation processes that use a combination of modeling and monitoring to demonstrate that downgradient receptors are not impacted.	May be implemented following active remediation, but will not be effective within 30-year period as a primary technology.	Retained

Table 6-1
Final Screening of Remedial Technologies
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

General Response Area	Remedial Technology Type	Process Options	Effectiveness	Implementability	Relative Cost	Retained for Detailed Evaluation?	Comments
No Action	None	Not applicable	**Ineffective**: Would not meet remedial action objectives (RAOs).	**Implementable**	Low	Yes	Wellhead treatment systems are already constructed and are operating.
Administrative Actions	Institutional Controls	Deed restrictions	**Ineffective**: Would not meet RAOs. Would not achieve Preliminary Remediation Goals (PRGs).	**Implementable**: Restrictions are obtainable, but ensuring long-term compliance may be difficult.	Low	Yes	Would not reduce risk. May be combined with other technologies.
		Groundwater monitoring	**Ineffective**: Would not meet RAOs. Would not achieve PRGs.	**Implementable**: No treatment system construction required. Monitoring wells may need to be installed.	Low	Yes	Would not meet groundwater cleanup objectives. Does not reduce risk. May be combined with other technologies.
		Wellhead treatment	**Effective**: Would meet the public health RAO but not the hydraulic control RAO.	**Implementable**: Treatment systems have already been installed in OU-2.	High	Yes	Most proactive technology to prevent public ingestion of site-related constituent of concern- (COC-) affected water. May be combined with other technologies.
Containment	Groundwater Extraction (Pumping with Treatment)	Extraction wells	**Ineffective**: Would not meet RAOs. Would reduce the long-term risks.	**Implementable**: Treatment systems have already been installed in OU-2.	High	Yes	Effective when combined with removal and treatment General Response Actions (GRAs).
Removal	Groundwater Extraction (Pumping with Treatment)	Extraction wells	**Ineffective**: Would not meet RAOs. Would reduce the long-term risks.	**Implementable**: Treatment systems have already been installed in OU-2.	High	Yes	Effective when combined with removal and treatment GRAs.
Discharge / Re-Use	Beneficial Re-Use	Process water / potable water	**Ineffective**: Must be combined with groundwater extraction and a treatment process to achieve RAOs.	**Implementable:** Several water purveyors are present in the vicinity of the site.	High	Yes	Effective when combined with removal and treatment GRAs.
	Subsurface Discharge	Subsurface injection	**Ineffective**: Must be combined with groundwater extraction and a treatment process to achieve RAOs.	**Implementable**: Diffusion wells have already been installed and are operating in OU-2.	High	Yes	Effective when combined with removal and treatment GRAs. Because the aquifer is a sole-source drinking water aquifer, subsurface injection will help maintain the water balance.
Ex-Situ **Treatment**	Physical	Volatilization - air stripping	**Ineffective**: Would meet water treatment objectives (i.e., standards, Criteria, and Guidance [SCGs]), but not RAOs.	**Implementable**: Already implemented at OU-2 IRM.	Low	Yes	Requires off-gas treatment. Effective when combined with other technologies.
		Adsorption - liquid-phase granular activated carbon (LPGAC)	**Ineffective**: Would meet water treatment objectives, but not RAOs.	**Implementable:** Similar footprint and technology as VPGAC that is used for air stripper off-gas treatment at the OU-2 IRM. Would be used in addition to or as a replacement to air stripping.	High	No	Not retained because it is not effective for specific site-related COCs (i.e., Freon 113).
		Adsorption - vapor-phase granular activated carbon (VPGAC)	**Ineffective**: Would meet water treatment objectives, but not RAOs.	**Implementable**: Already implemented at OU-2 IRM (VPGAC).	High	Yes	
		Adsorption - potassium permanganate-impregnated zeolite media (PPZ)	**Ineffective**: Would not meet RAOs. Would reduce the long-term risks.	**Implementable**: Treatment systems have already been installed in OU-2.	Moderate	No	Technology commonly used to address vinyl chloride air emissions from air stripper(s); however, vinyl chloride is not expected to be present in groundwater at the site.
	Chemical	Advanced oxidation	**Ineffective**: Would meet water treatment objectives, but not RAOs.	**Implementable**: Treatment systems have already been installed in OU-2.	High	No	Not retained because advanced oxidation is not as effective as air stripping or adsorption for site-related COCs.

Table 6-1
Final Screening of Remedial Technologies
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

General Response Area	Remedial Technology Type	Process Options	Effectiveness	Implementability	Relative Cost	Retained for Detailed Evaluation?	Comments
***In-Situ* Treatment**	Chemical	In-well air stripping	**Effective**: Would meet RAOs if enough wells are installed.	**Not Implementable**: Would require numerous access agreements to install wells in a closely spaced grid pattern in a highly developed area.	High	No	Would require numerous wells because of the size and depth of the plume. Additionally, would require Soil Vapor Extraction (SVE) off-gas treatment system.
		In-situ chemical oxidation (ISCO)	**Effective**: Would be effective if enough wells are installed and enough oxidant is delivered to the groundwater.	**Not Implementable**: Requires adequate delivery and oxidant contact with the site-related COCs to be effective. Regulators will not allow injection of substrate into drinking water aquifer.	High	No	Would require numerous wells because of the size and depth of the plume. Would require the injection of a very large volume of amendment solution.
	Biological/ Chemical/ Physical	Permeable reactive barrier (PRB) with zero valent iron (ZVI)	**Effective**: Would be effective if enough PRBs are installed throughout OU-2. Would require periodic reactivation.	**Not Implementable**: Regulators may not allow installation of PRBs in drinking water aquifer. Implementation may be limited by aquifer depth.	High	No	Obtaining access to install the PRB would be nearly impossible.
		Enhanced reductive dechlorination (ERD)	**Effective**: May be effective if enough substrate could be delivered and microorganisms are present. Ineffective on Freon 113, a site-related COC.	**Not Implementable**: Because of the large area of the plume, it would require numerous injection wells and periodic electron donor injections.	High	No	Injection of electron donors and the resulting anaerobic aquifer would impact use of the aquifer as a drinking water source. ERD may potentially stall at cis-1,2-dichloroethene and Freon 113.
		Air sparging with SVE	**Effective:** May be effective if numerous vertically-nested sparge wells are installed throughout OU-2.	**Not Implementable:** Because of the large saturated interval, it would require a sophisticated network of nested vertical and/or horizontal sparge points; therefore, would require numerous access agreements to install the infrastructure.	Moderate to High	No	Would require site access negotiations for installation of air sparging and SVE well and associated supporting infrastructure, including compressors, vapor treatment, and conveyances.
		Phytoremediation	**Not Effective**: The groundwater in OU-2 is too deep for phytoremediation to be effective.	**Not Implementable**: The plume is too deep and too large an area to effectively treat with phytoremediation.	High	No	OU-2 is an urban area in which it would be difficult to plant enough trees and the groundwater is too deep to be effective.
		Monitored natural attenuation	**Effective**: Would likely meet risk-based RAOs in the future. Would reduce the long-term risks.	**Implementable**: No construction required, except well installation.	Low	No	Must be combined with other remedial technologies. Will not achieve RAOs within 30-year period.

Table 7-1
Detailed Evaluation of Remedial Action Alternatives
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Criteria / Alternatives	RAA-1	RAA-2a	RAA-2b	RAA-2c	RAA-3a	RAA-3b	RAA-4a	RAA-4b	RAA-4c
	No Action/Institutional Controls and Operation of OU-1 Treatment System	Conversion of the IRM to the Final Remedy—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems	Conversion of the IRM to the Final Remedy—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of One New Remediation Well On-Site in the Basal Magothy Aquifer (EW1D)	Conversion of the IRM to the Final Remedy—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of One New Remediation Well On-site (EW1D), Installation of a New 1,200-gallons per minute (gpm) Treatment System at MLWD N5099.	Capture Additional Constituent of Concern (COC) Mass—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at Village of Lake Success Golf Course (VLSGC) (EW1D and RW300), Installation of Two New Diffusion Wells at OU-2 (DW103 and DW104). Treatment with IRM System.	Capture Additional COC Mass—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at VLSGC (EW1D and RW300), Installation of Two New Diffusion Wells at VLSGC (DW300 and DW301), Installation of a New 500-gpm Treatment System Near RW300 at VLSGC.	Targeted Hydraulic Control—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Three New Remediation Wells On-Site and at the Manhasset-Lakeville Water District (MLWD) (EW1D, RW400MM, and RW400BM), Installation of Four New Diffusion Wells at Fresh Meadow Country Club (FMCC) (DW400, DW401, DW402, and DW402a), Installation of a New 1,200-gpm Treatment System at MLWD.	Targeted Hydraulic Control—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Three New Remediation Wells On-Site and at the North Shore Long Island Jewish Hospital (NSLIJH) (EW1D, RW401MM, and RW401BM), Installation of Four New Diffusion Wells South of NSLIJH (DW404, DW404a, DW405, and DW406), Installation of a New 1,000-gpm Treatment System at NSLIJH.	Modified Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Three New Remediation Wells On-Site, at VLSGC, and at MLWD South (EW1D, RW300, and RW402), and Four New Diffusion Wells South of NSLIJH and North of MLWD (DW404, DW405, DW407, DW408), Installation of a New 1,600-gpm Treatment System East of FMCC.
Remedial Action Objectives (RAOs)									
Protect Public Health and the Environment from Exposure to COCs	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.
Remove COC Mass	Removes approximately **29,000** pounds of site-related COCs (OU-1 system).	Actively removes COC mass in the RW100 capture zone. Removes approximately **29,000** pounds of site-related COCs.	Actively removes COC mass in the RW100 capture zone and in the RW1RS, EW1, and EW1D capture zone (north of the OU-1 treatment area). Removes approximately **30,000** pounds of site-related COCs.	Actively removes COC mass in the RW100 capture zone; in the RW1RS, EW1, and EW1D capture zone (north of the OU-1 treatment area); and in the MLWD N5099 capture zone (north of FMCC). Removes approximately **31,000** pounds of site-related COCs.	Actively removes COC mass in the expanded RW100 and RW300 capture zone (west of RW100 between the Northern State Parkway [NSP] to the south and the LIE to the north). Removes approximately **31,000** pounds of site-related COCs.	Actively removes COC mass in the expanded RW100 and RW300 capture zone (west of RW100 between the NSP to the south and the LIE to the north). Removes approximately **31,000** pounds of site-related COCs.	Actively removes COC mass in the capture zone of each remediation well throughout OU-2 (north/northwest of Deepdale Golf Club, FMCC, and VLSGC). Removes approximately **30,000** pounds of site-related COCs.	Actively removes COC mass in the capture zone of each remediation well throughout OU-2 (north/northwest of Deepdale Golf Club). Removes approximately **30,000** pounds of site-related COCs.	Actively removes COC mass throughout OU-2. Removes approximately **31,000** pounds of site-related COCs.
Conformance with Standards, Criteria, and Guidance (SCGs)									
Complies with Chemical-Specific SCGs?	Complies with several chemical-specific SCGs, but not with the Clean Water Act (CWA) and New York State Department of Environmental Conservation (NYSDEC) ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.
Complies with Action-Specific SCGs?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Complies with Location-Specific SCGs?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Evaluation Criteria									
Long-Term Effectiveness and Permanence	Effective in the long term because institutional controls will be provided to site-related COC-affected purveyor wells. Will not comply with groundwater quality RAO.	Will be effective in the long term in the RW100 capture zone, but may not comply with the groundwater quality RAO.	Will be effective in the long term in the RW100 capture zone, but may not comply with the groundwater quality RAO.	Will be effective in the long term in the RW100 and N5099 capture zones, but may not comply with the groundwater quality RAO. Does not protect purveyor well N5099; however, wellhead treatment prior to discharge to the distribution system will protect public health. Other downgradient wells are also expected to be impacted.	Will be effective in the long term in the expanded RW100 and RW300 capture zone, but may not comply with the groundwater quality RAO. Does not protect downgradient water purveyor well N5099. Other downgradient wells are also expected to be impacted.	Will be effective in the long term in the expanded RW100, RW400, and RW502 capture zone, but may not comply with the groundwater quality RAO. Does not protect downgradient water purveyor well N5099. Other downgradient wells are also expected to be impacted.	Will be effective in the long term in the expanded RW400MM and RW400BM capture zone, but may not comply with the groundwater quality RAO. Reduces further impacts to nearest downgradient water purveyor well N5099. Other downgradient wells are expected to be impacted.	Will be effective in the long term in the expanded RW401MM and RW401BM capture zone, but may not comply with the groundwater quality RAO. Does not protect downgradient water purveyor well N5099. Other downgradient wells are also expected to be impacted.	Will be effective in the long term throughout OU-2. Does not protect downgradient water purveyor well N5099. Other downgradient wells are also expected to be impacted.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 36,200 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 31,900 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 30,400 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 22,400 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 23,900 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 23,900 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 25,500 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 25,500 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 19,000 acre-feet.

Table 7-1
Detailed Evaluation of Remedial Action Alternatives
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Criteria / Alternatives	RAA-1 No Action/Institutional Controls and Operation of OU-1 Treatment System	RAA-2a Conversion of the IRM to the Final Remedy—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems	RAA-2b Conversion of the IRM to the Final Remedy—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of One New Remediation Well On-Site in the Basal Magothy Aquifer (EW1D)	RAA-2c Conversion of the IRM to the Final Remedy—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of One New Remediation Well On-site (EW1D), Installation of a New 1,200-gallons per minute (gpm) Treatment System at MLWD N5099.	RAA-3a Capture Additional Constituent of Concern (COC) Mass—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at Village of Lake Success Golf Course (VLSGC) (EW1D and RW300), Installation of Two New Diffusion Wells at OU-2 (DW103 and DW104). Treatment with IRM System.	RAA-3b Capture Additional COC Mass—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at VLSGC (EW1D and RW300), Installation of Two New Diffusion Wells at VLSGC (DW300 and DW301), Installation of a New 500-gpm Treatment System Near RW300 at VLSGC.	RAA-4a Targeted Hydraulic Control—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Three New Remediation Wells On-Site and at the Manhasset-Lakeville Water District (MLWD) (EW1D, RW400MM, and RW400BM), Installation of Four New Diffusion Wells at Fresh Meadow Country Club (FMCC) (DW400, DW401, DW402, and DW402a), Installation of a New 1,200-gpm Treatment System at MLWD.	RAA-4b Targeted Hydraulic Control—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Three New Remediation Wells On-Site and at the North Shore Long Island Jewish Hospital (NSLIJH) (EW1D, RW401MM, and RW401BM), Installation of Four New Diffusion Wells South of NSLIJH (DW404, DW404a, DW405, and DW406), Installation of a New 1,000-gpm Treatment System at NSLIJH.	RAA-4c Modified Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Three New Remediation Wells On-Site, at VLSGC, and at MLWD South (EW1D, RW300, and RW402), and Four New Diffusion Wells South of NSLIJH and North of MLWD (DW404, DW405, DW407, DW408), Installation of a New 1,600-gpm Treatment System East of FMCC.
Short-Term Impact and Effectiveness	Will be effective in the short term with **minimal** impact to the public, the workers, and the environment. Time to meet RAOs is indeterminate.	Will be effective in the short term with **minimal** impact to the public, the workers, and the environment. Will meet RAOs in approximately 17 years, approximately 27 years, and more than 30 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **minimal** impact to the public, the workers, and the environment. Will meet RAOs in approximately 18 years for the golf course wells and more than 30 years for the public and remedial supply wells.	Will be effective in the short term with **minimal** impact to the public, the workers, and the environment. Will meet RAOs in approximately 19 years for the golf course and remedial wells and more than 30 years for the public supply wells.	Will be effective in the short term with **minimal** impact to the public, the workers, and the environment. But installing new infrastructure will impact the public more than RAA-2a and RAA-2b. Will meet RAOs in approximately 19 years, approximately 27 years, and approximately 28 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **moderate** impact to the public, the workers, and the environment. Installing new infrastructure will impact the public more than RAA-2a and RAA-2b. Will meet RAOs in approximately 20 years, approximately 25 years, and more than 30 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure will impact the public more than RAA-3a and RAA-3b. Will meet RAOs in approximately 16 years, more than 30 years, and approximately 25 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure will impact the public more than RAA-4a. Will meet RAOs in approximately 17 years, more than 30 years, and approximately 25 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure, including a pipeline that crosses the LIE, will impact the public more than RAA-4b. Will meet RAOs in approximately 16 years for the golf course wells and approximately 25 years for the remedial and public supply wells.
Implementability	Implementable; overall implementability score is **4**. OU-1 treatment system is already constructed and operational; hence this RAA was given a technical implementability score of 1. Access agreements will be needed for the installation and sampling of new groundwater monitoring wells; therefore, RAA-1 was given an administrative implementability score of 3.	Implementable; overall implementability score is **4**. IRM and wellhead treatment systems are already constructed and operational; hence, this RAA was given a technical implementability score of 1. Access agreements will be needed for the installation and sampling of new groundwater monitoring wells; therefore, RAA-2a was given an administrative implementability score of 3.	More difficult to implement than RAA-1 and RAA-2a; overall implementability score is **5**. IRM and wellhead treatment systems are already constructed and operational; hence, this RAA was given a technical implementability score of 1. Access agreements will be needed for the installation and sampling of new groundwater monitoring wells and installation of one new remediation well; therefore, RAA-2b was given an administrative implementability score of 4.	More difficult to implement than RAA-2b; overall implementability score is 6. IRM and wellhead treatment systems are already constructed and operational; however, a new treatment system and associated infrastructure are proposed. Accordingly, this RAA was given a technical implementability score of 2. Access agreements will also be needed for the installation of the new treatment system, new remediation well, and new groundwater monitoring wells; therefore, RAA-2c was given an administrative implementability score of 4.	More difficult to implement than RAA-2b; overall implementability score is **10**. Although this RAA does not involve the installation of any new treatment systems besides IRM and wellhead treatment systems which are already constructed and operational, access agreements will still be required to install remediation wells and associated infrastructure. Accordingly, RAA-3a was given a technical implementability score of 3 and an administrative implementability score of 7.	Less difficult to implement than RAA-3a; overall implementability score is **6**. A technical implementability score of 2 was given to this RAA. Although RAA-3b includes the installation of a new treatment system, a new remediation well, and new diffusion wells at VLSGC property, Village of Lake Success (VLS) has indicated willingness to discuss access to implement this RAA. Therefore, an administrative implementability score of 4 was assigned to RAA-3b.	Less implementable than RAA-3a; overall implementability score is **12**. IRM and wellhead treatment systems are already constructed and operational; however, a new treatment system, new remediation wells, new diffusion wells, and associated infrastructure are proposed. Accordingly, this RAA was given a technical implementability score of 3. Access agreements will be needed for the installation of the components of this RAA. FMCC declined to provide access to install remediation infrastructure; therefore, an administrative implementability score of 9 was given to RAA-4a.	Less difficult to implement than RAA-4a; overall implementability score is **6**. A technical implementability score of 2 was given to this RAA. Although RAA-4b includes the installation of a new treatment system, new remediation wells, and new diffusion wells at the NSLIJH property, NSLIJH indicated willingness to negotiate access to install these components. Therefore, an administrative implementability score of 4 was assigned to RAA-4b.	Less implementable than RAA-4b; overall implementability score is **11**. A technical implementability score of 3 was given to this RAA. RAA-4c may not be implementable because proposed pipelines will cross Lakeville Road, the LIE, and possibly Little Neck Parkway, which will require obtaining access agreements from numerous stakeholders; including Nassau County and New York State Department of Transportation (NYSDOT). The installation of this RAA's components will also require access to MLWD, VLS, FMCC, and NSLIJH. As a result, RAA-4c was given an administrative implementability score of 8.

Table 7-1
Detailed Evaluation of Remedial Action Alternatives
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Criteria / Alternatives	RAA-1	RAA-2a	RAA-2b	RAA-2c	RAA-3a	RAA-3b	RAA-4a	RAA-4b	RAA-4c
	No Action/Institutional Controls and Operation of OU-1 Treatment System	Conversion of the IRM to the Final Remedy—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems	Conversion of the IRM to the Final Remedy—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of One New Remediation Well On-Site in the Basal Magothy Aquifer (EW1D)	Conversion of the IRM to the Final Remedy—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of One New Remediation Well On-site (EW1D), Installation of a New 1,200-gallons per minute (gpm) Treatment System at MLWD N5099.	Capture Additional Constituent of Concern (COC) Mass—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at Village of Lake Success Golf Course (VLSGC) (EW1D and RW300), Installation of Two New Diffusion Wells at OU-2 (DW103 and DW104). Treatment with IRM System.	Capture Additional COC Mass—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at VLSGC (EW1D and RW300), Installation of Two New Diffusion Wells at VLSGC (DW300 and DW301), Installation of a New 500-gpm Treatment System Near RW300 at VLSGC.	Targeted Hydraulic Control—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Three New Remediation Wells On-Site and at the Manhasset-Lakeville Water District (MLWD) (EW1D, RW400MM, and RW400BM), Installation of Four New Diffusion Wells at Fresh Meadow Country Club (FMCC) (DW400, DW401, DW402, and DW402a), Installation of a New 1,200-gpm Treatment System at MLWD.	Targeted Hydraulic Control—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Three New Remediation Wells On-Site and at the North Shore Long Island Jewish Hospital (NSLIJH) (EW1D, RW401MM, and RW401BM), Installation of Four New Diffusion Wells South of NSLIJH (DW404, DW404a, DW405, and DW406), Installation of a New 1,000-gpm Treatment System at NSLIJH.	Modified Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Three New Remediation Wells On-Site, at VLSGC, and at MLWD South (EW1D, RW300, and RW402), and Four New Diffusion Wells South of NSLIJH and North of MLWD (DW404, DW405, DW407, DW408), Installation of a New 1,600-gpm Treatment System East of FMCC.
Consistency with Green Remediation Principles	No additional infrastructure required; therefore, minimal energy and water requirements, air emissions, impact to land, material consumption, waste generation, health and safety concerns, or impacts on the sustainability of the surrounding community.	No additional infrastructure required; therefore, minimal energy and water requirements, air emissions, impact to land, material consumption, waste generation, health and safety concerns, or impacts on the sustainability of the surrounding community.	One new remediation well to be installed; therefore, minimal energy and water requirements, air emissions, impact to land, material consumption, waste generation, health and safety concerns, or impacts on the sustainability of the surrounding community.	One new treatment system and one new remediation well to be installed; extracted groundwater to be treated and discharged to distribution system for beneficial use. Minimal energy requirements, air emissions, impact to land, material consumption, waste generation, health and safety concerns, or impacts on the sustainability of the surrounding community.	Two new remediation wells, two new diffusion wells, and associated piping to be installed; additional groundwater flow to be re-injected into the subsurface; therefore, lowering water impacts. Generally, minimal energy and water requirements, air emissions, impact to land, material consumption, waste generation, health and safety concerns, or impacts on the sustainability of the surrounding community.	Four new remediation and diffusion wells and one treatment system to be installed on-site and at a golf course. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine vapor-phase granular activated carbon (VPGAC) changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and treatment system will be installed on a golf course; minimal energy requirements and health and safety concerns.	Seven new remediation and diffusion wells and one new treatment system to be installed on-site and adjacent to a golf course. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation, and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and the treatment system will be installed adjacent to a golf course; minimal energy requirements and health and safety concerns.	Seven new remediation and diffusion wells and one new treatment system to be installed on-site and south of NSLIJH. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and the treatment system will be installed at the edge of a parking lot; minimal energy requirements and health and safety concerns.	Seven new remediation and diffusion wells and one new treatment system to be installed on-site and at a golf course. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and the treatment system will be installed on a golf course; minimal energy requirements and health and safety concerns.
Costs									
Cost Effectiveness	**$9,000,000**	**$32,000,000**	**$38,000,000**	**$39,000,000**	**$42,000,000**	**$55,000,000**	**$65,000,000**	**$61,000,000**	**$69,000,000**

Table 7-1
Detailed Evaluation of Remedial Action Alternatives
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Criteria / Alternatives	RAA-4d	RAA-4e	RAA-4f	RAA-4g	RAA-4h	RAA-5a	RAA-5b
	Minimized Impact to Public Supply Wells—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Five New Remediation Wells On-Site, at MLWD, at the Village of Lake Success Park (VLSP), and at the Korean Church (KC) (EW1D, RW400BM, RW400MM, RW403, and RW404), Installation of Eight New Diffusion Wells North and South of NSLIJH (DW404-, DW406, DW405a, and DW409-DW412), Installation of a New 3,000-gpm Treatment System at KC.	**Minimized Impact to Public Supply Wells—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Four New Remediation Wells On-Site, at VLSGC, and at NSLIJH (EW1D, RW300, RW400MM, and RW400MM), Installation of Six New Diffusion Wells at VLSGC and South of NSLIJH (DW300, DW301, DW404, DW404a, DW405, and DW405a), Installation of Two New 800-gpm Treatment Systems at NSLIJH and VLSGC.**	**Minimized Impact to Public Supply Wells—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at KC (EW1D and RW404), Installation of Four New Diffusion Wells North and South of NSLIJH (DW404, DW405, DW409, and DW410), Installation of a New 1,600-gpm Treatment System at KC.**	**Targeted Hydraulic Control—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of One New Remediation Well On-Site (EW1D), Installation of Four New Diffusion Wells North and South of NSLIJH (DW411-DW414), Installation of a New 1,200-gpm Treatment System at MLWD N5099.**	**Modified Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at VLSGC (EW1D and RW300), Installation of Six New Diffusion Wells at VLSGC and North and South of NSLIJH (DW300, DW301, and DW411-DW-414), Installation of Two New Treatment Systems at VLSGC (500 gpm) and at MLWD N5099 (2,000 gpm).**	**Modified Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Five New Remediation Wells On-Site, at VLSGC, VLSP, and MLWD (EW1D, RW300, RW403, RW400BM, and RW400MM), Installation of Nine New Diffusion Wells at FMCC and South of NSLIJH (DW401-DW406 and DW415-DW417), Installation of Two New Treatment Systems at VLSGC (1,700 gpm) and East of FMCC (1,500 gpm).**	**Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Five New Remediation Wells On-Site and North of Long Island Expressway (LIE) (EW1D and RW501-RW504) and Nine New Diffusion Wells (DW501-DW509) North of LIE, Installation of Two New Treatment Systems in the Northeast Corner of VLSGC (1,300 gpm) and South of NSLIJH (2,000-gpm).**
Remedial Action Objectives (RAOs)							
Protect Public Health and the Environment from Exposure to COCs	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.	Protective of public health and the environment. Achieves public health protection RAO.
Remove COC Mass	Actively removes COC mass throughout OU-2. Removes approximately **32,000** pounds of site-related COCs.	Actively removes COC mass throughout OU-2. Removes approximately **31,000** pounds of site-related COCs.	Actively removes COC mass throughout OU-2. Removes approximately **31,000** pounds of site-related COCs.	Actively removes COC mass in the MLWD N5099 capture zone (north of FMCC). Removes approximately **29,000** pounds of site-related COCs.	Actively removes COC mass throughout OU-2. Removed approximately **31,000** pounds of site-related COCs.	Actively removes COC mass throughout OU-2. Removes approximately **32,000** pounds of site-related COCs.	Actively removes COC mass throughout OU-2. Removes approximately **32,000** pounds of site-related COCs.
Conformance with Standards, Criteria, and Guidance (SCGs)							
Complies with Chemical-Specific SCGs?	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.	Complies with several chemical-specific SCGs, but not with the CWA and NYSDEC ambient water quality standards.
Complies with Action-Specific SCGs?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Complies with Location-Specific SCGs?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Evaluation Criteria							
Long-Term Effectiveness and Permanence	Complies with RAOs. Will be effective in the long term throughout OU-2. Reduces further impacts to downgradient water purveyor well N5099 and is protective of Water Authority of Great Neck North (WAGNN) wells N4388 and N12796. Other downgradient wells are expected to be impacted.	Will be effective in the long term throughout OU-2. Does not protect downgradient water purveyor well N5099. Other downgradient wells are also expected to be impacted.	Will be effective in the long term throughout OU-2. Does not protect downgradient water purveyor well N5099. Other downgradient wells are also expected to be impacted.	Will be effective in the long term throughout OU-2. Does not protect downgradient water purveyor well N5099. Other downgradient wells are also expected to be impacted.	Will be effective in the long term throughout OU-2. Does not protect downgradient water purveyor well N5099. Other downgradient wells are also expected to be impacted.	Will be effective in the long term throughout OU-2 and is protective of WAGNN well N12796. Will be effective in reducing downgradient impacts to public supply wells.	Will be effective in the long term throughout OU-2 and is protective of N5099 and WAGNN wells N4388 and N12796; however, other downgradient wells are expected to be impacted.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 12,300 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 17,800 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 16,900 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 31,300 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 21,500 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 6,400 acre-feet.	It will not reduce toxicity or mobility. The volume of affected groundwater will be reduced from the initial condition of 73,700 acre-feet to 4,000 acre-feet.

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Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Criteria / Alternatives	RAA-4d	RAA-4e	RAA-4f	RAA-4g	RAA-4h	RAA-5a	RAA-5b
	Minimized Impact to Public Supply Wells—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Five New Remediation Wells On-Site, at MLWD, at the Village of Lake Success Park (VLSP), and at the Korean Church (KC) (EW1D, RW400BM, RW400MM, RW403, and RW404), Installation of Eight New Diffusion Wells North and South of NSLIJH (DW404-, DW406, DW405a, and DW409-DW412), Installation of a New 3,000-gpm Treatment System at KC.	**Minimized Impact to Public Supply Wells—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Four New Remediation Wells On-Site, at VLSGC, and at NSLIJH (EW1D, RW300, RW400MM, and RW400MM), Installation of Six New Diffusion Wells at VLSGC and South of NSLIJH (DW300, DW301, DW404, DW404a, DW405, and DW405a), Installation of Two New 800-gpm Treatment Systems at NSLIJH and VLSGC.**	**Minimized Impact to Public Supply Wells—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at KC (EW1D and RW404), Installation of Four New Diffusion Wells North and South of NSLIJH (DW404, DW405, DW409, and DW410), Installation of a New 1,600-gpm Treatment System at KC.**	**Targeted Hydraulic Control—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of One New Remediation Well On-Site (EW1D), Installation of Four New Diffusion Wells North and South of NSLIJH (DW411-DW414), Installation of a New 1,200-gpm Treatment System at MLWD N5099.**	**Modified Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at VLSGC (EW1D and RW300), Installation of Six New Diffusion Wells at VLSGC and North and South of NSLIJH (DW300, DW301, and DW411-DW-414), Installation of Two New Treatment Systems at VLSGC (500 gpm) and at MLWD N5099 (2,000 gpm).**	**Modified Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Five New Remediation Wells On-Site, at VLSGC, VLSP, and MLWD (EW1D, RW300, RW403, RW400BM, and RW400MM), Installation of Nine New Diffusion Wells at FMCC and South of NSLIJH (DW401-DW406 and DW415-DW417), Installation of Two New Treatment Systems at VLSGC (1,700 gpm) and East of FMCC (1,500 gpm).**	**Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Five New Remediation Wells On-Site and North of Long Island Expressway (LIE) (EW1D and RW501-RW504) and Nine New Diffusion Wells (DW501-DW509) North of LIE, Installation of Two New Treatment Systems in the Northeast Corner of VLSGC (1,300 gpm) and South of NSLIJH (2,000-gpm).**
Short-Term Impact and Effectiveness	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure will impact the public more than RAA-4b. Will meet RAOs in approximately 15 years, approximately 25 years, and approximately 7 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure will impact the public more than RAA-4b. Will meet RAOs in approximately 19 years, more than 30 years, and approximately 25 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure will impact the public more than RAA-4b. Will meet RAOs in approximately 16 years for the golf course wells and approximately 25 years for the remedial and public supply wells.	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure will impact the public more than RAA-4b. Will meet RAOs in approximately 18 years, approximately 19 years, and approximately 25 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure will impact the public more than RAA-4b. Will meet RAOs in approximately 19 years, approximately 30 years, and approximately 25 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure, including a pipeline that crosses the LIE, will impact the public more than all RAA-4 alternatives. Will meet RAOs in approximately 17 years, approximately 28 years, and approximately 7 years for the golf course, remedial, and public supply wells, respectively.	Will be effective in the short term with **high** impact to the public, the workers, and the environment. Installing new infrastructure, including a pipeline that crosses the LIE, will impact the public more than RAA-5a. Will meet RAOs in approximately 16 years, approximately 26 years, and approximately 7 years for the golf course, remedial, and public supply wells, respectively.
Implementability	Less implementable than RAA-4b; overall implementability score is **11**. A technical implementability score of 3 was given to this RAA. RAA-4d may not be implementable because proposed pipelines will cross Lakeville Road, Community Drive, and possibly Little Neck Parkway, which will require obtaining access agreements from numerous stakeholders; including Nassau County and NYSDOT. Access agreements will also be required to install a new treatment system at KC as well as several remediation and diffusion wells at NSLIJH, MLWD, and VLSP. As a result, RAA-4d was given an administrative implementability score of 8.	Less implementable than RAA-4b; overall implementability score is **7**. A technical implementability score of 3 was given to this RAA. Although RAA-4e includes the installation of two new treatment systems, new remediation wells, and new diffusion wells at VLSGC and NSLIJH, both stakeholders have indicated willingness to negotiate access to install remediation infrastructure. Therefore, an administrative implementability score of 4 was assigned to RAA-4e.	Less implementable than RAA-4b; overall implementability score is **9**. A technical implementability score of 3 was given to this RAA. Installing this RAA's components will require obtaining access agreements from numerous stakeholders, including NSLIJH, KC, Nassau County, Hebrew Academy, MLWD, VLS, and the NYSDOT. To date, only VLS and NSLIJH have agreed to negotiate access to their properties. Consequently, an administrative implementability score of 6 was assigned to this RAA.	Less implementable than RAA-4b; overall implementability score is 9. A technical implementability score of 3 was given to this RAA. Implementing this RAA will require obtaining access agreements from NSLIJH, Nassau County, NYSDOT, and MLWD for the installation of a new treatment system at MLWD N5099 and diffusion wells north and south of NSLIJH. To date, only NSLIJH has agreed to negotiate access to install remediation infrastructure. Accordingly, an administrative implementability score of 6 was given to RAA-4g.	Less implementable than RAA-4b; overall implementability score is 9. A technical implementability score of 3 was given to this RAA. Implementing this RAA will require obtaining access agreements from NSLIJH, Nassau County, VLS, NYSDOT, MLWD, and commercial properties for the installation of new treatment systems at MLWD N5099 and VLSGC and diffusion wells at VLSGC and north and south of NSLIJH. To date, only VLS and NSLIJH have agreed to negotiate access to install remediation infrastructure. Accordingly, an administrative implementability score of 6 was given to RAA-4h.	Less implementable than all RAA-4 alternatives; overall implementability score is **12**. A technical implementability score of 3 was given to this RAA. RAA-5a may not be implementable because proposed pipelines will cross Lakeville Road, the LIE, and Community Drive, which will require obtaining access agreements from numerous stakeholders; including Nassau County and NYSDOT. Access agreements will also be required to install the new treatment systems, remediation wells, diffusion wells, and associated infrastructure at NSLIJH, FMCC, MLWD, VLSP, and VLSGC. As a result, RAA-5a was given an administrative implementability score of 9.	Not implementable; overall implementability score is **14**, the highest of all RAAs. A technical implementability score of 4 was given to this RAA. The implementation of RAA-5b will require obtaining access agreements from numerous stakeholders; including VLSGC, NSLIJH, KC, and residential neighborhoods. The difficulty of obtaining access agreements from area neighborhoods is the main reason that RAA-5b is not implementable since residents have showed significant reluctance to allow the installation of treatment systems and pipelines. Additionally, pipelines will cross Lakeville Road, the LIE, and Community Drive, which will require obtaining access agreements from Nassau County and NYSDOT. RAA-5b was given the highest administrative implementability score, i.e., most difficult to implement, of 10.

Table 7-1
Detailed Evaluation of Remedial Action Alternatives
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Criteria / Alternatives	RAA-4d	RAA-4e	RAA-4f	RAA-4g	RAA-4h	RAA-5a	RAA-5b
	Minimized Impact to Public Supply Wells—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Five New Remediation Wells On-Site, at MLWD, at the Village of Lake Success Park (VLSP), and at the Korean Church (KC) (EW1D, RW400BM, RW400MM, RW403, and RW404), Installation of Eight New Diffusion Wells North and South of NSLIJH (DW404-, DW406, DW405a, and DW409-DW412), Installation of a New 3,000-gpm Treatment System at KC.	**Minimized Impact to Public Supply Wells—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Four New Remediation Wells On-Site, at VLSGC, and at NSLIJH (EW1D, RW300, RW400MM, and RW400MM), Installation of Six New Diffusion Wells at VLSGC and South of NSLIJH (DW300, DW301, DW404, DW404a, DW405, and DW405a), Installation of Two New 800-gpm Treatment Systems at NSLIJH and VLSGC.**	**Minimized Impact to Public Supply Wells—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at KC (EW1D and RW404), Installation of Four New Diffusion Wells North and South of NSLIJH (DW404, DW405, DW409, and DW410), Installation of a New 1,600-gpm Treatment System at KC.**	**Targeted Hydraulic Control—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of One New Remediation Well On-Site (EW1D), Installation of Four New Diffusion Wells North and South of NSLIJH (DW411-DW414), Installation of a New 1,200-gpm Treatment System at MLWD N5099.**	**Modified Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Two New Remediation Wells On-Site and at VLSGC (EW1D and RW300), Installation of Six New Diffusion Wells at VLSGC and North and South of NSLIJH (DW300, DW301, and DW411-DW-414), Installation of Two New Treatment Systems at VLSGC (500 gpm) and at MLWD N5099 (2,000 gpm).**	**Modified Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Five New Remediation Wells On-Site, at VLSGC, VLSP, and MLWD (EW1D, RW300, RW403, RW400BM, and RW400MM), Installation of Nine New Diffusion Wells at FMCC and South of NSLIJH (DW401-DW406 and DW415-DW417), Installation of Two New Treatment Systems at VLSGC (1,700 gpm) and East of FMCC (1,500 gpm).**	**Hydraulic Containment—Institutional Controls, Operation of the OU-1 and OU-2 Treatment Systems, Installation of Five New Remediation Wells On-Site and North of Long Island Expressway (LIE) (EW1D and RW501-RW504) and Nine New Diffusion Wells (DW501-DW509) North of LIE, Installation of Two New Treatment Systems in the Northeast Corner of VLSGC (1,300 gpm) and South of NSLIJH (2,000-gpm).**
Consistency with Green Remediation Principles	Thirteen new remediation and diffusion wells and one new treatment system to be installed on-site and at KC. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and the treatment system will be installed in a parking lot; minimal energy requirements and health and safety concerns.	Ten new remediation and diffusion wells and two new treatment systems to be installed on-site and at VLSGC and NSLIJH. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and treatment systems will be installed on a golf course or in a parking lot; minimal energy requirements and health and safety concerns.	Six new remediation and diffusion wells and one new treatment system to be installed on-site and at KC. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and the treatment system will be installed in a parking lot; minimal energy requirements and health and safety concerns.	Five new remediation and diffusion wells and one new treatment system to be installed on-site and at MLWD N5099 north of FMCC. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and the treatment system will be installed adjacent to a golf course; minimal energy requirements and health and safety concerns.	Eight new remediation and diffusion wells and two new treatment systems to be installed on-site and at VLSGC and MLWD N5099. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and treatment systems will be installed at or adjacent to a golf course; minimal energy requirements and health and safety concerns.	Fourteen new remediation and diffusion wells and two new treatment systems to be installed on-site and at VLSGC, VLSP, MLWD, NSLIJH, and FMCC. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and treatment systems will be installed at golf courses; minimal energy requirements and health and safety concerns.	Fourteen new remediation and diffusion wells and two new treatment systems to be installed on-site and at VLSGC, NSLIJH, and several residential neighborhoods. Low water impacts because of subsurface re-injection of treated groundwater; moderate material use and waste generation and associated impacts from transportation of treatment materials on- and off-site as part of routine VPGAC changeouts; low air emissions by using local suppliers for construction materials and utilizing trucks and heavy machinery that run on biofuels to haul construction and treatment materials and wastes; minimal effect on land use because all piping will be installed underground and treatment systems will be installed at or adjacent to golf courses; minimal energy requirements and health and safety concerns.
Costs							
Cost Effectiveness	**$89,000,000**	**$80,000,000**	**$64,000,000**	**$66,000,000**	**$91,000,000**	**$102,000,000**	**$97,000,000**

Table 7-2
Technical and Administrative Implementability Evaluation of Remedial Action Alternatives
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

FS Scenario	Description	New Remedial System Flow Rate (gpm)[3]	Remedial Action Objectives				Prevents/Minimizes Impacts to Purveyor Wells[1]				Access Status					Costs			
							Year of Impact (Duration of Impact [years])[2]									NPV			NPV/lb
			Achieve SCGs (Y/N)	Mass Removal via Remedial Wells (lbs)	Mass Removal via Remedial, Supply, and Golf Course Wells (lbs)	Significant Reduction to Purveyor Well Impacts[4] (Y/N)	MLWD N5099	WAGNN Wells 12999,13000, and 13821 (13000b)	WAGNN 12796	WAGNN 4388	Implementability[5]	Access Required[6]	Number of Additional Treatment Systems	Number of Remediation Wells	Number of Diffusion Wells	Capital	O&M	Total	$/lb
RAA-1	**OU-1 Only**	**0**	**N**	**5,600**	**29,200**	**N**	**2016 (25)**	**2011 (30)**	**2035 (4)**	**2028 (13)**	**4**	**None**	**None**	**None**	**None**	**$ 5,100,000**	**$ 3,500,000**	**$ 8,600,000**	**$ 300**
RAA-2a	**OU-1 and OU-2**	**0**	**N**	**10,200**	**29,300**	**N**	**2016 (25)**	**2011 (30)**	**2035 (4)**	**2028 (12)**	**4**	**Review and update existing agreements**	**None**	**None**	**None**	**$ 8,600,000**	**$ 23,000,000**	**$ 32,000,000**	**$ 1,100**
RAA-2b	**OU-1,OU-2, Additional Deep Well at OU-1**	**120**	**N**	**11,700**	**29,600**	**N**	**2016 (25)**	**2011 (30)**	**2037 (4)**	**2029 (12)**	**5**	**Review and update existing agreements (GN School, NYSDOT, MLWD)**	**None**	**1**	**None**	**$ 9,800,000**	**$ 28,000,000**	**$ 38,000,000**	**$ 1,300**
RAA-2c	**OU-1,OU-2, Additional Deep Well at OU-1, Extraction at N5099 at 1,200 gpm**	**1,320**	**N**	**11,600**	**30,800**	**N**	**2013 (26)**	**2011 (30)**	**2039 (1)**	**2031 (7)**	**5**	**Review and update existing agreements (GN School, NYSDOT, MLWD)**	**1**	**1**	**None**	**$ 14,000,000**	**$ 25,000,000**	**$ 39,000,000**	**$ 1,300**
RAA-3a	**OU-1, OU-2, Additional Deep Well at OU-1, Extraction at VLSGC, and Diffusion at OU-2**	**620**	N	**19,800**	**30,600**	N	**2016 (25)**	**2011 (28)**	**2038 (3)**	**2030 (11)**	**10**	**County, VLS, GN School, NYSDOT**	**None**	**2**	**2**	**$ 14,000,000**	**$ 28,000,000**	**$ 42,000,000**	**$ 1,400**
RAA-3b	**OU-1, OU-2, Additional Deep Well at OU-1, Extraction and Diffusion at VLSGC**	**620**	**N**	**18,300**	**30,900**	**N**	**2016 (25)**	**2011 (30)**	**2033 (8)**	**2028 (13)**	**6**	**VLS**	**1**	**2**	**2**	**$ 20,000,000**	**$ 35,000,000**	**$ 55,000,000**	**$ 1,800**
RAA-4a	OU-1, OU-2, Additional Deep Well at OU-1, Extraction at MLWD, and Diffusion at FMCC	1,320	N	25,300	30,100	N	2016 (1)	2011 (25)	2032 (9)	2027 (14)	12	*FMCC*, **MLWD**, NYSDOT	1	3	4	$ 23,000,000	$ 42,000,000	$ 65,000,000	$ 2,200
RAA-4b	OU-1, OU-2, Additional Deep Well at OU-1, Extraction and Diffusion at NSLIJH South	1,120	N	25,000	30,300	N	2016 (25)	2011 (7)	2038 (3)	2029 (12)	7	**NSLIJH**	1	3	4	$ 23,000,000	$ 38,000,000	$ 61,000,000	$ 2,000
RAA-4c	OU-1, OU-2, Additional Deep Well at OU-1, Extraction at VLSGC and MLWD South, and Diffusion at MLWD and NSLIJH South	1,720	N	26,900	30,900	N	2016 (25)	2011 (8)	2039 (2)	2029 (12)	11	VLS, NYSDOT, County, NSLIJH, **MLWD**	1	3	4	$ 27,000,000	$ 42,000,000	$ 69,000,000	$ 2,200
RAA-4d	OU-1, OU-2, Additional Deep Well at OU-1, Extraction at MLWD, VLSP, and Korean Church, and Diffusion at NSLIJH North and South	3,120	N	29,900	31,600	Y	2016 (5)	2011 (7)	Not Impacted	Not Impacted	11	**VLS**, NYSDOT, County, **NSLIJH**, **MLWD**, Korean Church, Hebrew Academy	1	5	8	$ 35,000,000	$ 54,000,000	$ 89,000,000	$ 2,800
RAA-4e	OU-1, OU-2, Additional Deep Well at OU-1, Extraction at VLSGC and NSLIJH, and Diffusion at VLSGC and NSLIJH South	1,720	N	27,300	31,200	N	2016 (25)	2011 (7)	2033 (8)	2028 (13)	7	**VLS, NSLIJH**	2	4	6	$ 31,000,000	$ 49,000,000	$ 80,000,000	$ 2,600

Table 7-2
Technical and Administrative Implementability Evaluation of Remedial Action Alternatives
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

FS Scenario	Description	New Remedial System Flow Rate (gpm)[3]	Remedial Action Objectives				Prevents/Minimizes Impacts to Purveyor Wells[1]				Access Status					Costs			
							Year of Impact (Duration of Impact [years])[2]									NPV			NPV/lb
			Achieve SCGs (Y/N)	Mass Removal via Remedial Wells (lbs)	Mass Removal via Remedial, Supply, and Golf Course Wells (lbs)	Significant Reduction to Purveyor Well Impacts[4] (Y/N)	MLWD N5099	WAGNN Wells 12999,13000, and 13821 (13000b)	WAGNN 12796	WAGNN 4388	Implementability[5]	Access Required[6]	Number of Additional Treatment Systems	Number of Remediation Wells	Number of Diffusion Wells	Capital	O&M	Total	$/lb
RAA-4f	OU-1, OU-2, Additional Deep Well at OU-1, Extraction at Korean Church, and Diffusion at NSLIJH North and South	1,720	N	27,700	31,100	N	2016 (25)	2011 (8)	2040 (1)	2030 (11)	9	**NYSDOT**, County, NSLIJH, Korean Church, Hebrew Academy	1	2	4	$ 23,000,000	$ 41,000,000	$ 64,000,000	$ 2,100
RAA-4g	OU-1, OU-2, Additional Deep Well at OU-1, Extraction at N5099, and Diffusion at Macy's Parking Lot and NSLIJH South	1,320	N	26,400	29,000	N	2016 (25)	2011 (12)	2035 (6)	2028 (13)	9	**NYSDOT**, County, NSLIJH	2	2	4	$ 22,000,000	$ 44,000,000	$ 66,000,000	$ 2,300
RAA-4h	OU-1, OU-2, Additional Deep Well at OU-1, Extraction at N5099, and Diffusion at Macy's Parking Lot and NSLIJH South, VLSGC - Pump, Treat, and Diffuse at 500 gpm	1,820	N	28,400	30,800	N	2016 (25)	2011 (10)	2032 (9)	2027 (14)	9	**NYSDOT**, County, NSLIJH, Commercial Property, VLSGC	3	3	6	$ 35,000,000	$ 56,000,000	$ 91,000,000	$ 3,000
RAA-5a	OU-1, OU-2, Additional Deep Well at OU-1, Extraction at VLSGC, VLSP, and MLWD, and Diffusion at FMCC and NSLIJH South	3,320	N	30,500	32,100	Y	2016 (1)	2011 (6)	Not Impacted	2034 (7)	12	**VLS**, NYSDOT, County, *FMCC*, **NSLIJH, MLWD**	2	5	9	$ 42,000,000	$ 60,000,000	$ 102,000,000	$ 3,200
RAA-5b	OU-1, OU-2, Additional Deep Well at OU-1, and Extraction and Diffusion at NSLIJH South, FMCC, and Residential Area North of LIE	3,420	N	30,900	32,400	Y	Not Impacted	2011 (7)	Not Impacted	Not Impacted	14	**MLWD**, County, NYSDOT, *FMCC*, and extensive neighborhood access	2	5	9	$ 34,000,000	$ 63,000,000	$ 97,000,000	$ 3,000

Abbreviations:

FMCC - Fresh Meadow Country Club
FS - Feasibility Study
gpm - gallons per minute
lb - Pound
LIE - Long Island Expressway
µg/L - Micrograms per liter
MLWD - Manhasset Lakeville Water District
N - No
NPV - Net Present Value (include purveyor well costs)
NYSDEC - New York State Department of Environmental Conservation
NYSDOT - New York State Department of Transportation
NSLIJH - North Shore Long Island Jewish Health System
OU-1 - Operable Unit 1
OU-2 - Operable Unit 2
SCGs - Standards, Criteria, and Guidelines
TVOC - Total Volatile Organic Carbon
VLS - Village of Lake Success
VLSGC - Village of Lake Success Golf Course
VLSP - Village of Lake Success Park
WAGNN - Water Authority of Great Neck North
County - Nassau County
WAWNC - Water Authority of Western Nassau County
Y - Yes

Notes:

[1] - IU Willet well is not impacted, WAWNC Well N7445 is not impacted.

[2] - Impact defined as TVOC concentration greater than 5 µg/L based on 30-year analysis. Duration of impact includes the first year of impact.

[3] - The OU-1 treatment system flow rate is currently 730 gpm, and the OU-2 treatment system flow rate is 500 gpm.

[4] - Reduces Duration of Impact to N12999, N13000, N13000b, and N5099 wells by 10 or more years

[5] - The implementability score is the sum of an Administrative Implementability score (1 to 10) and a Technical Implementability Score (1 to 4) that was determined from the following scales:

Administrative Implementability

1	No new access agreements needed
2	Updating existing access agreements
3	New monitoring access agreements
4	Access anticipated for all components with major stakeholders
5	Access anticipated for major components with major stakeholders, public right-of-way and community acceptance, minor construction disruption
6	Access anticipated for some major components, public right-of-way and community acceptance, major construction disruption
7	Unknown access for major components - public right-of-way and community acceptance, minor construction disruption
8	Unknown access for major components - public right-of-way and community acceptance, major construction disruption
9	Access denied for major components - public right-of-way and community acceptance, major construction disruption
10	No known mechanism for gaining access - significant major equipment in residential areas, multiple stakeholders and major disruptions

Technical Implementability

1	Implementable
2	Potentially Implementable
3	Difficult to Implement
4	Not Implementable

The lower the aggregate number, the more implementable the alternative is.
Yellow highlight indicates that the RAA is implementable.

[6] - Current status of property access for each entity is denoted as follows:

Bold - Written notice of intent to negotiate access.
Italics - Verbal notice of denial for installation of any or all parts of treatment system.
Underline - Verbal commitment from NYSDEC for public right-of-way access (NYSDOT).

Table 7-3
Time to Achieve Total Volatile Organic Compound Concentration of Less than 5 µg/L
Feasibility Study, Operable Unit 2
Former Unisys Facility, Great Neck, New York

Feasibility Study Scenario Category	Year Well is Impacted by Simulated TVOC Plume >5 µg/L		Year Simulated TVOC Concentrations Decrease <5 µg/L	
	Water Supply Wells	Golf Course Wells	Water Supply Wells	Golf Course Wells
RAA-1	2010	2010	>30	16
RAA-2a	2010	2010	>30	17
RAA-2b	2010	2010	>30	18
RAA-2c	2010	2010	>30	19
RAA-3a	2010	2010	28	19
RAA-3b	2010	2010	>30	20
RAA-4a	2010	2010	25	16
RAA-4b	2010	2010	25	17
RAA-4c	2010	2010	25	16
RAA-4d	2010	2010	7	15
RAA-4e	2010	2010	25	19
RAA-4f	2010	2010	25	16
RAA-4g	2010	2010	25	18
RAA-4h	2010	2010	25	19
RAA-5a	2010	2010	7	17
RAA-5b	2010	2010	7	16

Notes:

µg/L - Micrograms per liter

TVOC - Total volatile organic compounds

Table 7-4
Remedial Action Alternatives Cost Estimate Summary
Feasibility Study, Operable Unit 2
Lockheed Martin Corporation, Great Neck, New York

Alternative	Capital	Operation and Maintenance	Total
	30-Year Net Present Value Cost		
RAA-1	$ 5,100,000	$ 3,500,000	$ 8,600,000
RAA-2a	$ 8,600,000	$ 23,000,000	$ 32,000,000
RAA-2b	$ 9,800,000	$ 28,000,000	$ 38,000,000
RAA-2c	$ 14,000,000	$ 25,000,000	$ 39,000,000
RAA-3a	$ 14,000,000	$ 28,000,000	$ 42,000,000
RAA-3b	$ 20,000,000	$ 35,000,000	$ 55,000,000
RAA-4a	$ 23,000,000	$ 42,000,000	$ 65,000,000
RAA-4b	$ 23,000,000	$ 38,000,000	$ 61,000,000
RAA-4c	$ 27,000,000	$ 42,000,000	$ 69,000,000
RAA-4d	$ 35,000,000	$ 54,000,000	$ 89,000,000
RAA-4e	$ 31,000,000	$ 49,000,000	$ 80,000,000
RAA-4f	$ 23,000,000	$ 41,000,000	$ 64,000,000
RAA-4g	$ 22,000,000	$ 44,000,000	$ 66,000,000
RAA-4h	$ 35,000,000	$ 56,000,000	$ 91,000,000
RAA-5a	$ 42,000,000	$ 60,000,000	$ 102,000,000
RAA-5b	$ 34,000,000	$ 63,000,000	$ 97,000,000

Note:
Costs are escalated at 3.5% and discounted at 8%.

Table 7-5
Volume of Affected Groundwater and Residual COC Mass After 30 Years of Remediation
Feasibility Study, Operable Unit 2
Lockheed Martin Corporation, Great Neck, New York

Scenario Name	Initial Volume of Affected Groundwater (Acre-Feet) [1]	Volume of Affected Groundwater After 30 Years of Remediation (Acre-Feet) [2]	Volume Reduction After 30 Years or Remediation (%)	Initial Off-Site COC Mass (Pounds)	Initial On Site COC Mass (Pounds)	Total COC Mass Removed by Remedial, Supply, and Golf Course Wells (Pounds)	Total Estimated Residual On Site and Off-Site COC Mass After 30 Years of Remediation (Pounds)
1	73,700	36,200	51%	26,000	7,000	29,200	3,800
2a	73,700	31,900	57%	26,000	7,000	29,300	3,700
2b	73,700	30,400	59%	26,000	7,000	29,600	3,400
2c	73,700	22,400	70%	26,000	7,000	30,800	2,200
3a	73,700	23,900	68%	26,000	7,000	30,600	2,400
3b	73,700	23,900	68%	26,000	7,000	30,900	2,100
4a	73,700	25,500	65%	26,000	7,000	30,100	2,900
4b	73,700	25,500	65%	26,000	7,000	30,300	2,700
4c	73,700	19,000	74%	26,000	7,000	30,900	2,100
4d	73,700	12,300	83%	26,000	7,000	31,600	1,400
4e	73,700	17,800	76%	26,000	7,000	31,200	1,800
4f	73,700	16,900	77%	26,000	7,000	31,100	1,900
4g	73,700	31,300	58%	26,000	7,000	29,000	4,000
4h	73,700	21,500	71%	26,000	7,000	30,800	2,200
5a	73,700	6,400	91%	26,000	7,000	32,100	900
5b	73,700	4,000	95%	26,000	7,000	32,400	600

Notes:

[1] - Represents volume of affected groundwater with total volatile organic compound concentration greater than 5 µg/L.

Table 8-1
Recommended Remedy Evaluation Matrix
Feasibility Study, Operable Unit 2
Lockheed Martin Corporation, Great Neck, New York

Scenario Name	Implementability Score	30-Year Total Net Present Value Cost (Millions)	Net Present Value Cost per Pound	Mass Removed by Remedial, Supply, and Golf Course Wells (Pounds)
1	4	$9	$300	29,000
2a	4	$32	$1,100	29,000
2b	5	$38	$1,300	30,000
2c	6	$39	$1,300	31,000
3a	10	$42	$1,400	31,000
3b	6	$55	$1,800	31,000
4a	12	$65	$2,100	30,000
4b	6	$61	$2,000	30,000
4c	11	$69	$2,200	31,000
4d	11	$89	$2,800	32,000
4e	7	$80	$2,500	31,000
4f	9	$64	$2,100	31,000
4g	9	$66	$2,300	29,000
4h	9	$91	$3,000	31,000
5a	12	$102	$3,100	32,000
5b	14	$97	$3,000	32,000

Note:

Implementability is ranked from 2 to 14, from the least to the most difficult.

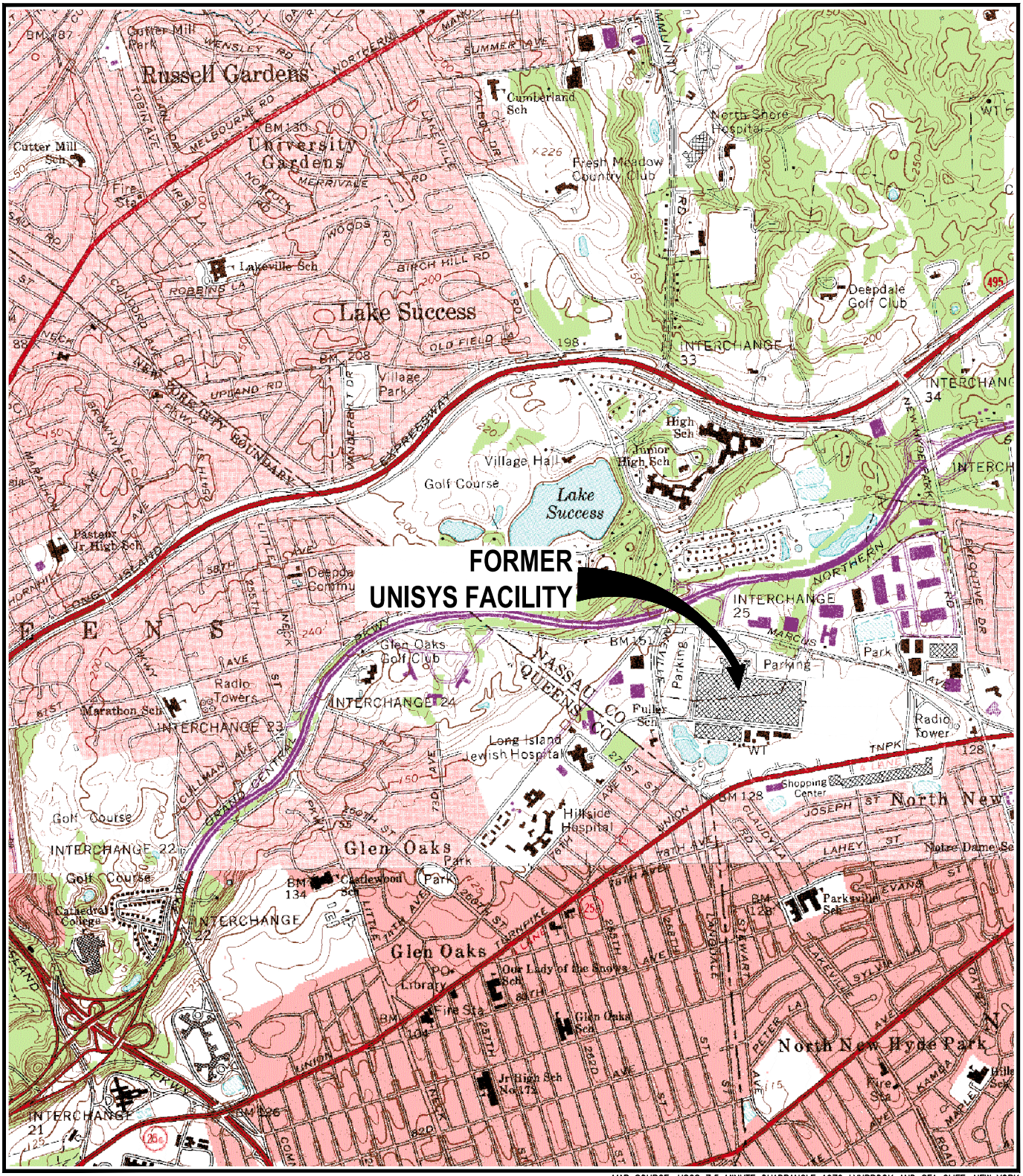
Table 8-2
Volume of Affected Groundwater and Residual COC Mass for the Implementable RAAs After 30 Years of Remediation
Feasibility Study, Operable Unit 2
Lockheed Martin Corporation, Great Neck, New York

Scenario Name	Initial Volume of Affected Groundwater (Acre-Feet) [1]	Volume of Affected Groundwater After 30 Years of Remediation (Acre-Feet) [2]	Volume Reduction After 30 Years or Remediation (%)	Initial Off-Site COC Mass (Pounds)	Initial On Site COC Mass (Pounds)	Total COC Mass Removed by Remedial, Supply, and Golf Course Wells (Pounds)	Total Estimated Residual On Site and Off-Site COC Mass After 30 Years of Remediation (Pounds)
1	73,700	36,200	51%	26,000	7,000	29,200	3,800
2a	73,700	31,900	57%	26,000	7,000	29,300	3,700
2b	73,700	30,400	59%	26,000	7,000	29,600	3,400
2c	73,700	22,400	70%	26,000	7,000	30,800	2,200
3b	73,700	23,900	68%	26,000	7,000	30,900	2,100

Notes:

[1] - Represents volume of affected groundwater with total volatile organic compound concentration greater than 5 µg/L.

Figures



MAP SOURCE: USGS 7.5 MINUTE QUADRANGLE 1979 LYNBROOK AND SEA CLIFF, NEW YORK

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

SITE LOCATION MAP

ARCADIS

FIGURE
1-1

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NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION

0 1600’ 3200’

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

SITE LAYOUT MAP

ARCADIS

FIGURE
2-1

CITY:MELVILLE DIV/GROUP:ENV DB:ALS LD: PIC: PM:SM TM: LYR:ON=*;OFF=*REF*
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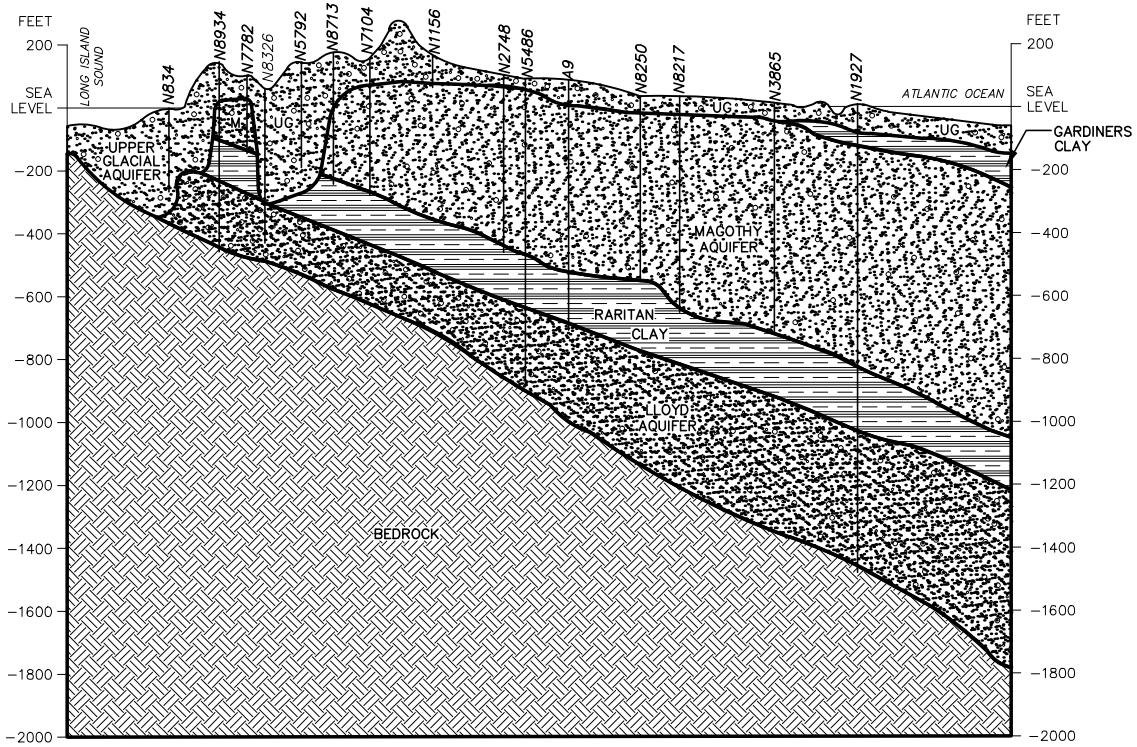

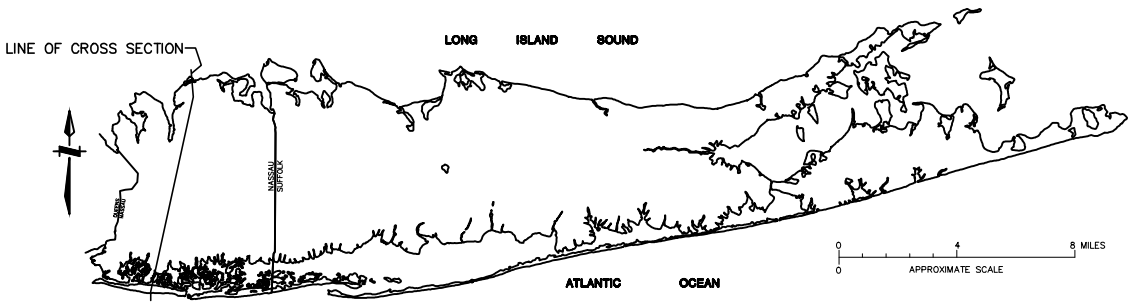

EXPLANATION

HYDROGEOLOGIC UNIT

- UG — Upper glacial aquifer
- Gc — Gardiners Clay
- M — Magothy aquifer
- Rc — Raritan confining unit
- L — Lloyd aquifer
- Br — Bedrock

S34 — WELL AND NUMBER—Vertical line indicates depth of borehole or well. Prefix letter N indicates Nassau County.

Hydrogeologic Contract

0 5 10 MILES
0 5 KILOMETERS
VERTICAL SCALE IS GREATLY EXAGGERATED
NATIONAL GEODETIC DATUM OF 1929

FIGURE AFTER SMOLENSKY, ETAL 1989

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

REGIONAL GEOLOGIC CROSS-SECTION THROUGH NASSAU COUNTY

ARCADIS

FIGURE
3-1

LEGEND:

- BODY OF WATER
- GOLF COURSE OR PARK
- MONITORING WELL CLUSTER
- MONITORING WELL
- SITE EXTRACTION OR RECOVERY WELL
- REMEDIATION SYSTEM DIFFUSION WELL
- DOMESTIC WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LOCATION ABANDONED/DESTROYED
- LOCATION OF FORMER ONSITE DIFFUSION WELLS
- LLOYD AQUIFER MONITORING WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- ABANDONED LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- **(NA)** NOT ACCESSIBLE

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

WELLS LOCATED WITHIN A 1.5-MILE, 2-MILE, AND 2.5-MILE RADIUS OF THE FORMER UNISYS FACILITY

ARCADIS

FIGURE
3-2

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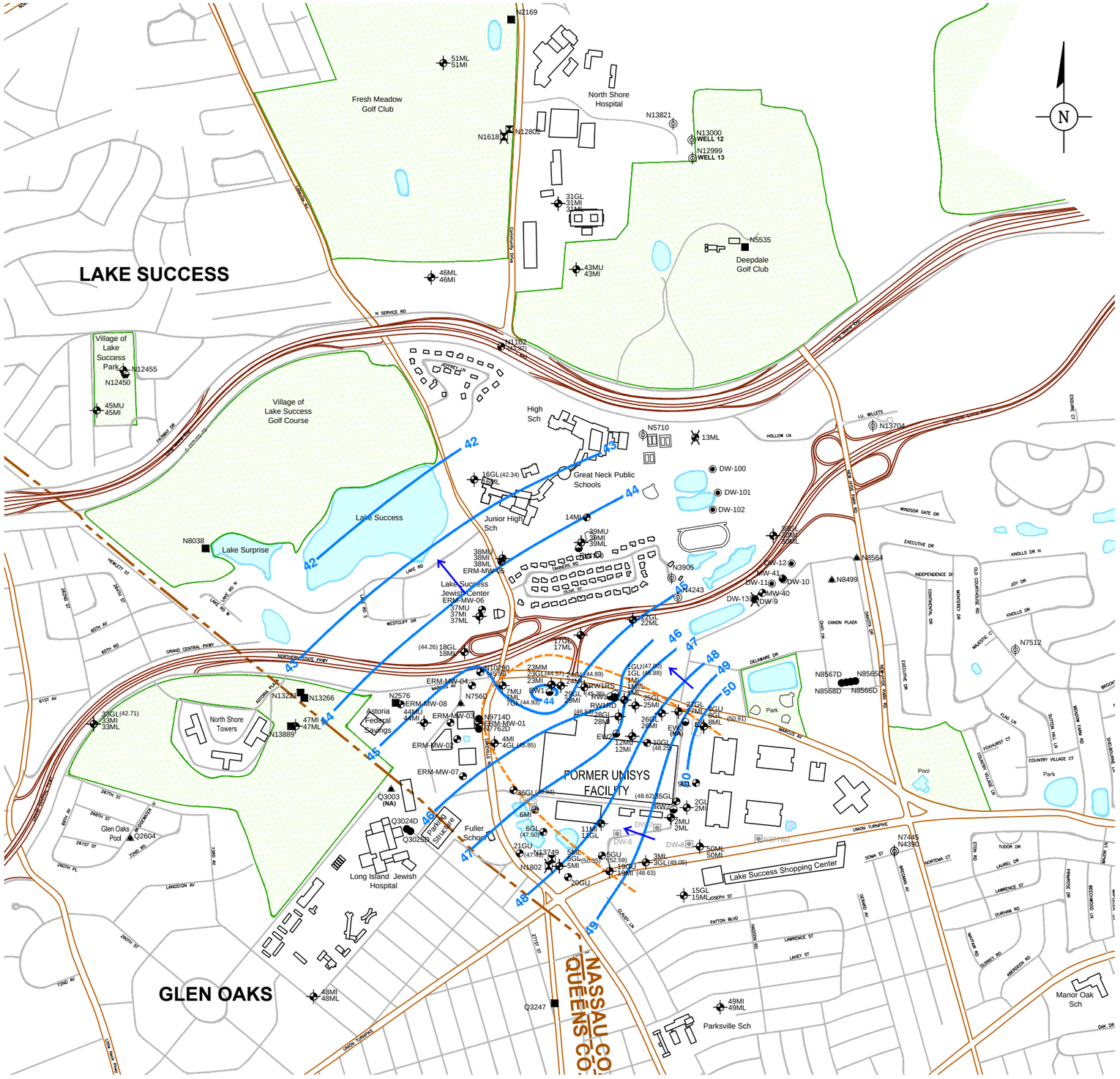

LEGEND:

- BODY OF WATER
- GOLF COURSE OR PARK
- MONITORING WELL CLUSTER
- MONITORING WELL
- SITE EXTRACTION OR RECOVERY WELL
- REMEDIATION SYSTEM DIFFUSION WELL
- DOMESTIC WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LOCATION ABANDONED/DESTROYED
- LLOYD AQUIFER MONITORING WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- ABANDONED LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- LOCATION OF FORMER ONSITE DIFFUSION WELLS
- (NA) NOT ACCESSIBLE
- 46 GROUNDWATER ELEVATION CONTOUR (FT ABOVE MSL)
- (51.78) WATER LEVEL ELEVATION (FT ABOVE MSL) JANUARY 11-13, 2010
- *(52.59) ANOMALOUS WATER LEVEL
- DIRECTION OF GROUNDWATER FLOW
- CAPTURE ZONE

DEFINITIONS:

GL-WELL SCREENED IN UPPER GLACIAL AQUIFER
GU-WELL SCREENED IN UPPER GLACIAL AQUIFER
MU-WELL SCREENED IN UPPER MAGOTHY FORMATION
MI-WELL SCREENED IN MIDDLE MAGOTHY FORMATION
ML-WELL SCREENED IN THE BASAL MAGOTHY FORMATION
gpm-GALLONS PER MINUTE

NOTES:

1. THE UPPER GLACIAL AQUIFER EXTENDS FROM APPROXIMATELY LAND SURFACE TO -24 FEET RELATIVE TO MEAN SEA LEVEL.
2. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   UPPER PORTION OF THE MAGOTHY - EW1
3. THE FOLLOWING OFF-SITE RECOVERY WELL WITHDRAWS FROM THE INDICATED AQUIFERS:
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100
4. THE FOLLOWING OFF-SITE MUNICIPAL SUPPLY WELLS WHEN PUMPING WITHDRAW FROM THE INDICATED AQUIFERS:
   UPPER PORTION OF THE MAGOTHY - N3905, N4243, AND N12999
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - N13000
   MIDDLE PORTION OF THE MAGOTHY - N4390
   MIDDLE AND BASAL PORTION OF THE MAGOTHY - N5710
   BASAL PORTION OF THE MAGOTHY - N7445 AND N7512
5. THE FOLLOWING OFF-SITE NON-MUNICIPAL SUPPLY WELLS WITHDRAW FROM THE INDICATED AQUIFERS WHEN PUMPING:
   UPPER GLACIAL - GLEN OAKS POOL, N2219, N3756, N4202, AND Q3247
   UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - Q1908
   UPPER GLACIAL AND UPPER AND MIDDLE PORTION OF THE MAGOTHY - N8499 AND N8564
   UPPER PORTION OF THE MAGOTHY - N7560, N8211, AND Q1909
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - N8499
   MIDDLE PORTION OF THE MAGOTHY - N11048 AND Q3003
   BASAL PORTION OF THE MAGOTHY - N8358
6. THE FOLLOWING OFF-SITE NON-MUNICIPAL DIFFUSION WELLS RECHARGE TO THE INDICATED AQUIFER WHEN OPERATING:
   UPPER GLACIAL - N2220D, N4203D, N7762D, N8787D AND N9714D
   UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - Q3024D
   UPPER PORTION OF THE MAGOTHY - Q3025D AND N8568D
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - N8565D, N8566D, AND N8567D
   MIDDLE PORTION OF THE MAGOTHY - DW9 (ABANDONED JANUARY 2008), DW10, N9876D, N9877D, N11080 AND N11081D
   MIDDLE AND BASAL PORTION OF THE MAGOTHY - DW11, DW12, DW-13, DW100, N8372D AND N8373D
   BASAL PORTION OF THE MAGOTHY - DW101, DW102, AND N8358
7. EW-1 PUMPING AT 365 gpm, RWIRS PUMPING AT 265 gpm, RWIRD PUMPING AT 100 gpm
8. DW-11 RECHARGING AT 260 gpm
   DW-12 RECHARGING AT 55 gpm
   DW-13 RECHARGING AT 415 gpm
9. RW-100 PUMPING AT 504 gpm
10. DW-100 RECHARGING AT 0 gpm
    DW-101 RECHARGING AT 0 gpm
    DW-102 RECHARGING AT 504 gpm

0 600' 1200'
SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

POTENTIOMETRIC SURFACE CONFIGURATION OF THE UPPER GLACIAL AQUIFER 2010

ARCADIS

FIGURE
3-3a

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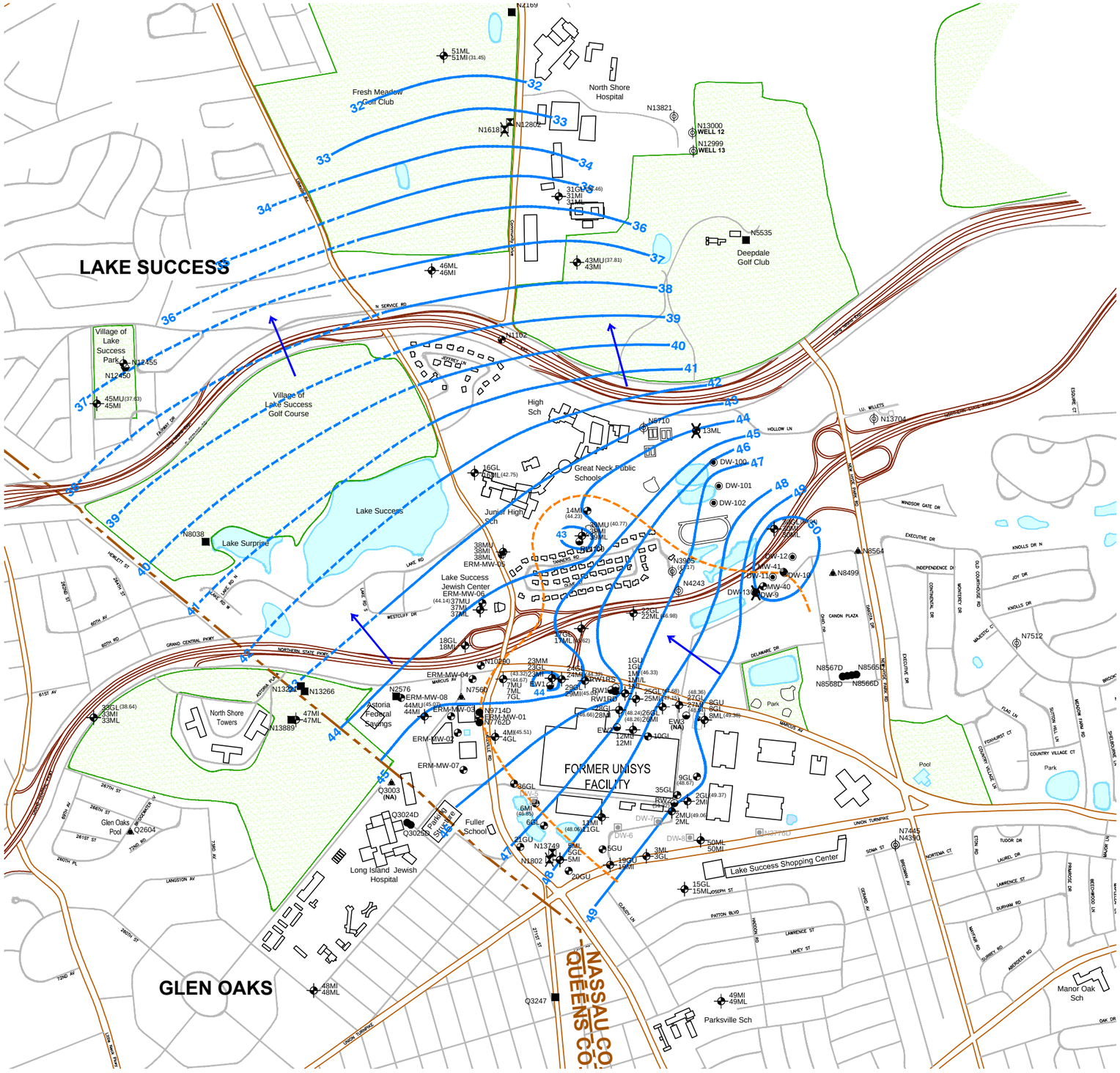
LAKE SUCCESS
GLEN OAKS
FORMER UNISYS FACILITY
Fresh Meadow Golf Club
North Shore Hospital
Deepdale Golf Club
Village of Lake Success Park
Village of Lake Success Golf Course
Lake Success
Lake Surprise
Lake Success Jewish Center
Great Neck Public Schools
High Sch
Junior High Sch
Fuller School
Long Island Jewish Hospital
North Shore Towers
Astoria Federal Savings
Glen Oaks Pool
Lake Success Shopping Center
Parksville Sch
Manor Oak Sch
NASSAU CO.
QUEENS CO.
N2169
N12802
N13821
N13000 WELL 12
N12999 WELL 13
N5535
N12455
N12450
N8038
N10102
N9710
N13704
N8564
N8499
N4243
N3905
N7512
N8567D
N8565D
N8568D
N8566D
N7445
N4390
N1322
N13266
N13889
N2576
N7560
N9714D
N7762D
N1802
N13749
Q2604
Q3003 (NA)
Q3024D
Q3025D
Q3247
51ML 51MI(31.45)
46ML 46MI
43MU(37.81) 43MI
45MU(37.63) 45MI
16GL 16ML(42.75)
14MI (44.23)
38MU (40.77) 38MI 38ML
38MI 38MI 38ML ERM-MW-05
37MU (44.14) 37MI 37MI 37ML ERM-MW-06
18GL 18MI
17GL 17ML(45.62)
22GL 22ML(46.98)
31GL(45.46) 31MI 31ML
23MM 23GL 23MI(43.33)
ERM-MW-04 (44.67)
ERM-MW-08 44MU(45.07) 44MI
ERM-MW-03
ERM-MW-01
4MI(45.51) 4GL
ERM-MW-07
33GL(38.64) 33MI 33ML
47MI 47ML
49MI 49ML
RW1 RW1RS RW1RB
EW2 EW3 (NA)
DW-100 DW-101 DW-102
DW-11 DW-12 DW-13
MW-41 MW-40 MW-9
DW-10
DW-6 DW-7 DW-8
13ML
10GL
12MU 12MI
25GL 25MI(44.12)
27GL 27MI
26GL 26MI
29GL 29MI(45.66)
28MI
1GU 1GL 1MU(46.33) 1ML 1MI
8GU 8GL 8ML(49.38)
9GL (48.67)
2GL(49.37) 2MI
2MU(49.06) 2MI
11MI 11GL (48.06)
36GL
6MI (49.85)
6GL
5GU 5GL 5MI
3MI 3GL
19GU 19MI
20GU
15GL 15ML
50MI 50MI
11MU(48.36) 11GL
35GL
ERM-MW-09
ERM-MW-10
ERM-MW-11
ERM-MW-12
ERM-MW-13
ERM-MW-14
ERM-MW-15
ERM-MW-16
ERM-MW-17
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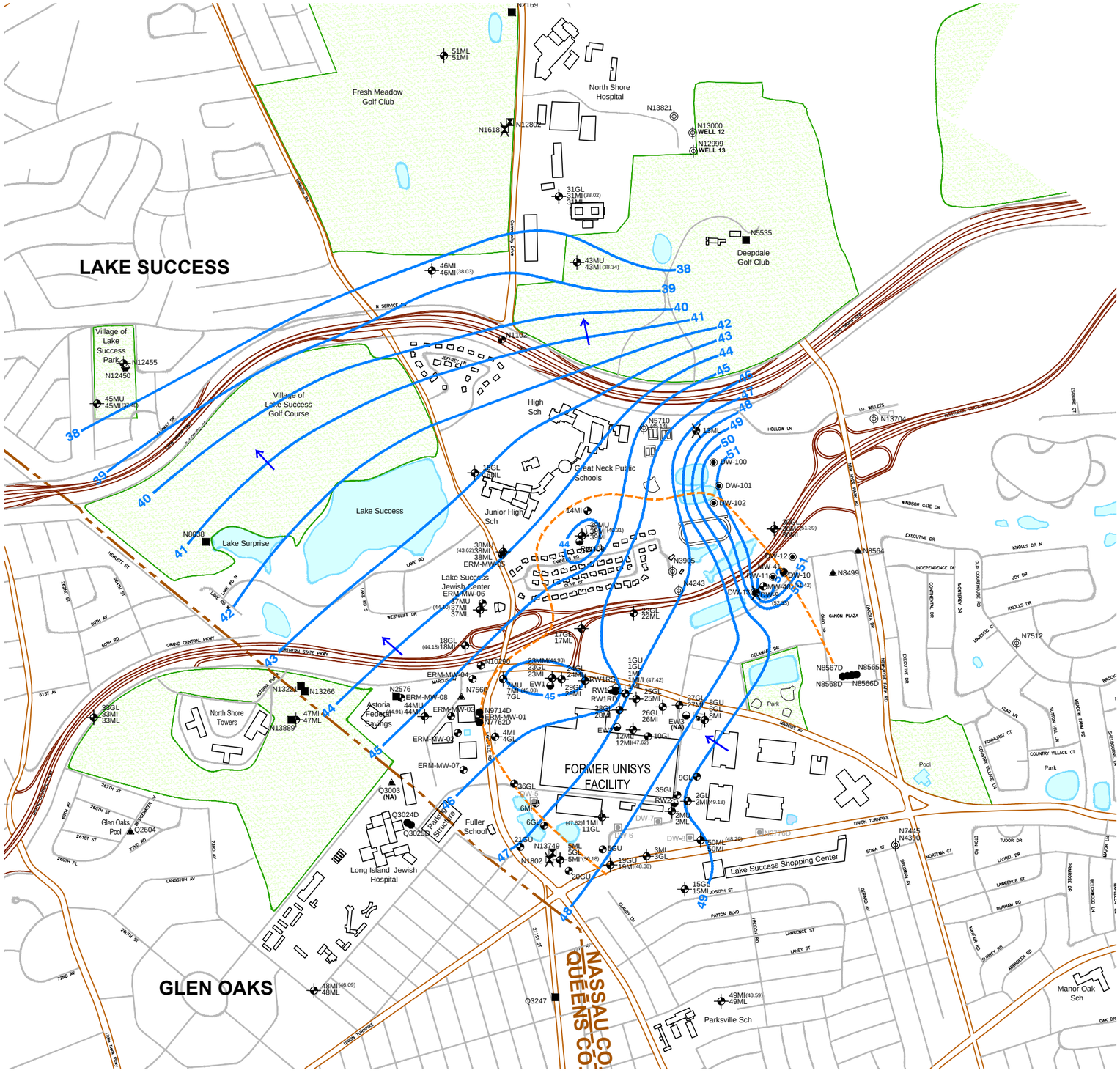

LEGEND:

- BODY OF WATER
- GOLF COURSE OR PARK
- MONITORING WELL CLUSTER
- MONITORING WELL
- SITE EXTRACTION OR RECOVERY WELL
- REMEDIATION SYSTEM DIFFUSION WELL
- DOMESTIC WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LOCATION ABANDONED/DESTROYED
- LLOYD AQUIFER MONITORING WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- ABANDONED LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- LOCATION OF FORMER ONSITE DIFFUSION WELLS
- (NA) NOT ACCESSIBLE
- 46 GROUNDWATER ELEVATION CONTOUR (FT ABOVE MSL)
- (51.78) WATER LEVEL ELEVATION (FT ABOVE MSL) JANUARY 11-13, 2010
- *(50.18) ANOMALOUS WATER LEVEL
- DIRECTION OF GROUNDWATER FLOW
- CAPTURE ZONE

DEFINITIONS:

GL-WELL SCREENED IN UPPER GLACIAL AQUIFER
GU-WELL SCREENED IN UPPER GLACIAL AQUIFER
MU-WELL SCREENED IN UPPER MAGOTHY FORMATION
MI-WELL SCREENED IN MIDDLE MAGOTHY FORMATION
ML-WELL SCREENED IN THE BASAL MAGOTHY FORMATION
gpm-GALLONS PER MINUTE

NOTES:

1. THE UPPER GLACIAL AQUIFER EXTENDS FROM APPROXIMATELY LAND SURFACE TO -24 FEET RELATIVE TO MEAN SEA LEVEL.
2. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   UPPER PORTION OF THE MAGOTHY - EW1
3. THE FOLLOWING OFF-SITE RECOVERY WELL WITHDRAWS FROM THE INDICATED AQUIFERS:
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100
4. THE FOLLOWING OFF-SITE MUNICIPAL SUPPLY WELLS WHEN PUMPING WITHDRAW FROM THE INDICATED AQUIFERS:
   UPPER PORTION OF THE MAGOTHY - N3905, N4243, AND N12999
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - N13000
   MIDDLE PORTION OF THE MAGOTHY - N4390
   MIDDLE AND BASAL PORTION OF THE MAGOTHY - N5710
   BASAL PORTION OF THE MAGOTHY - N7445 AND N7512
5. THE FOLLOWING OFF-SITE NON-MUNICIPAL SUPPLY WELLS WITHDRAW FROM THE INDICATED AQUIFERS WHEN PUMPING:
   UPPER GLACIAL - GLEN OAKS POOL, N2219, N3756, N4202, AND Q3247
   UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - Q1908
   UPPER GLACIAL AND UPPER AND MIDDLE PORTION OF THE MAGOTHY - N8499 AND N8564
   UPPER PORTION OF THE MAGOTHY - N7560, N8211, AND Q1909
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - N8499
   MIDDLE PORTION OF THE MAGOTHY - N11048 AND Q3003
   BASAL PORTION OF THE MAGOTHY - N8358
6. THE FOLLOWING OFF-SITE NON-MUNICIPAL DIFFUSION WELLS RECHARGE TO THE INDICATED AQUIFER WHEN OPERATING:
   UPPER GLACIAL - N2220D, N4203D, N7762D, N8787D AND N9714D
   UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - Q3024D
   UPPER PORTION OF THE MAGOTHY - Q3025D AND N8568D
   UPPER AND MIDDLE PORTION OF THE MAGOTHY - N8565D, N8566D, AND N8567D
   MIDDLE PORTION OF THE MAGOTHY - DW9 (ABANDONED JANUARY 2008), DW10, N9876D, N9877D, N11080 AND N11081D
   MIDDLE AND BASAL PORTION OF THE MAGOTHY - DW11, DW12, DW-13, DW100, N8372D AND N8373D
   BASAL PORTION OF THE MAGOTHY - DW101, DW102, AND N8358
7. EW-1 PUMPING AT 365 gpm, RWIRS PUMPING AT 265 gpm, RWIRD PUMPING AT 100 gpm
8. DW-11 RECHARGING AT 260 gpm
   DW-12 RECHARGING AT 55 gpm
   DW-13 RECHARGING AT 415 gpm
9. RW-100 PUMPING AT 504 gpm
10. DW-100 RECHARGING AT 0 gpm
    DW-101 RECHARGING AT 0 gpm
    DW-102 RECHARGING AT 504 gpm

0 600' 1200'
SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

POTENTIOMETRIC SURFACE CONFIGURATION OF THE MIDDLE MAGOTHY AQUIFER 2010

ARCADIS

FIGURE
3-3c

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
\\NY1FP1\Data\ENVCAD\Melville-NY\ACTIFS Scenario\Fig 03-03c 2010 psc midmag.dwg LAYOUT: 3-3C SAVED: 12/29/2010 1:35 PM ACADVER: 18.1S (LMS TECH)
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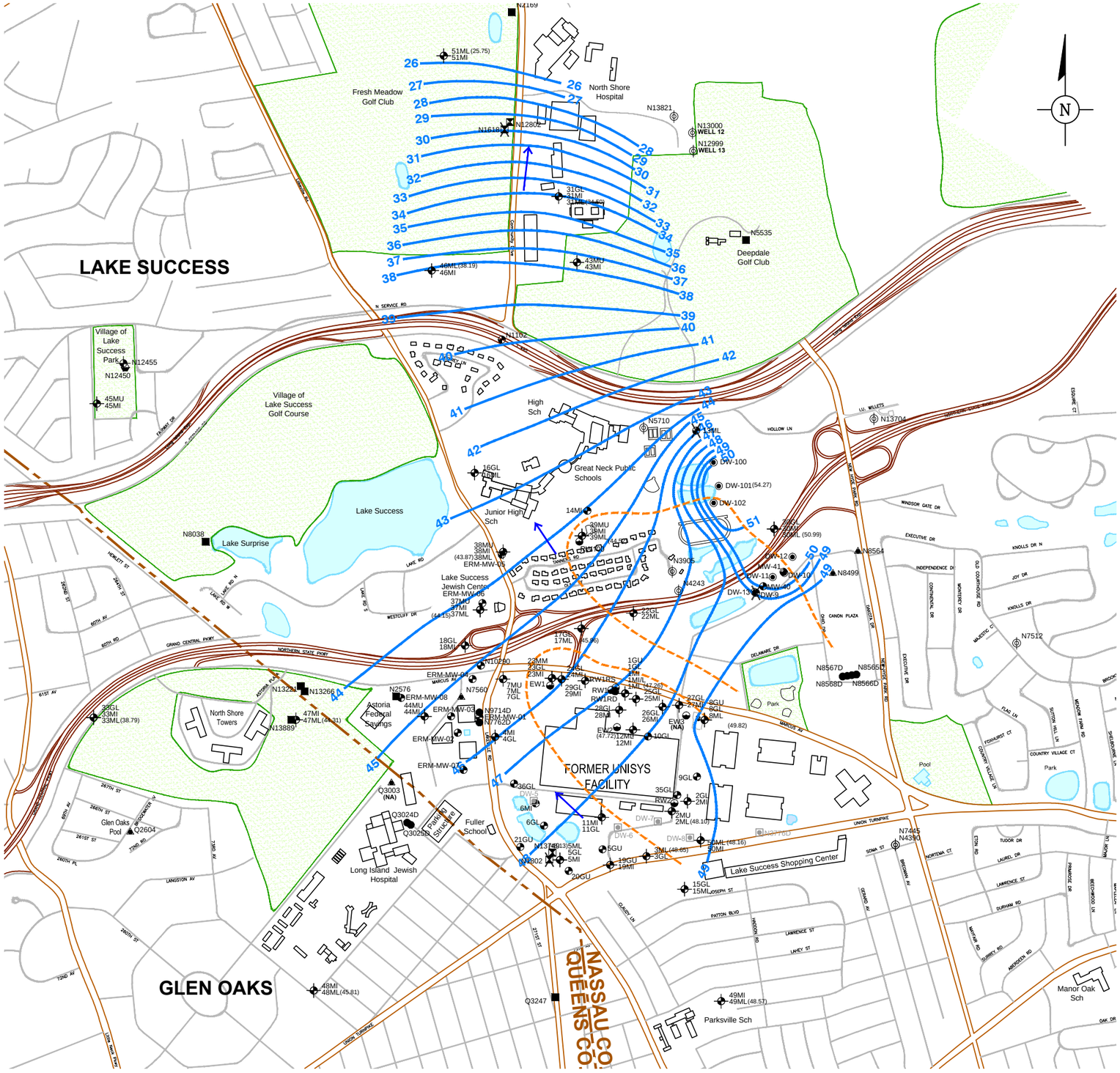
LAKE SUCCESS
GLEN OAKS
FORMER UNISYS FACILITY
Fresh Meadow Golf Club
North Shore Hospital
Deepdale Golf Club
Village of Lake Success Park
Village of Lake Success Golf Course
Lake Success
Lake Surprise
Lake Success Jewish Center
High Sch
Great Neck Public Schools
Junior High Sch
Fuller School
Long Island Jewish Hospital
North Shore Towers
Astoria Federal Savings
Glen Oaks Pool
Parkville Sch
Manor Oak Sch
Lake Success Shopping Center
NASSAU CO. / QUEENS CO.
N
51ML(25.75)
51MI
N12802
N13000 WELL 12
N12999 WELL 13
N5535
43MU 43MI
46ML(38.19) 46MI
N11102
N12455
N12450
45MU 45MI
N8038
N13222
N13266
N13889
N10260
N7560
N7714D
N7762D
N5710
N13704
N3905
N4243
N8564
N8499
N7512
N8567D
N8565D
N8568D
N8566D
N7445
N4390
N8358
Q3003 (NA)
Q3024D
Q3025D
Q2604
Q3247
DW-100
DW-101(54.27)
DW-102
DW-11
DW-12
DW-13
DW-10
DW-9
DW-6
DW-7
DW-8
N13710D
N13711D
N8376D
N8372D
N11080
N9876D
N9877D
N9714D
N2220D
N4203D
N7762D
N8787D
RW1RS
RW1RD
RW2S
RW2D
EW1
EW2
EW3 (NA)
MW-4D
MW-5D
ERM-MW-01
ERM-MW-02
ERM-MW-03
ERM-MW-04
ERM-MW-05
ERM-MW-06
ERM-MW-07
ERM-MW-08
N2576
N2169
N1618
N13821
31GL 31MI 31ML(34.69)
16GL 16ML
14MU 14MI
39MU 39MI 39ML(41.76)
38MU 38MI 38ML(43.87) ERM-MW-05
37MU 37MI 37ML(44.15)
22GL 22ML
17GL 17ML(45.35)
18GL 18ML
23MU 23MI 23ML(47.72)
29GL 29MI
27GL 27MI
26GL 26MI
25GL 25MI
28GL 28MI
12MU 12MI(47.72)
10GL
8GU 8GL 8ML(49.82)
4MI 4GL
36GL
6MI
6GL
11MI 11GL
35GL
9GL
2GU 2MI
2MU 2ML(48.10)
21GU
5GU
19GU 19MI
3MU 3GL
15GL 15MI
30GL 30MI 30ML(50.99)
33GL 33MI 33ML(38.79)
47MI 47ML(44.31)
49MI 49ML(48.57)
48MI 48ML(45.81)
1GU 1GL 1MU 1MI 1ML(47.26)
7MU 7ML 7GL
4MU 4MI 4ML
5GL 5MI
13MI(48.16) 13ML
30MI
3ML(48.65) 3GL
N1370 N13702
N1202
Park
Pool
Pond
Golf Course
Cemetery
Sch
Ct
Dr
Rd
Ln
Pl
Ave
Av
Pkwy
Hwy
Expwy
Blvd
Cir
Ter
Sq
Ctr
Plz
Sta
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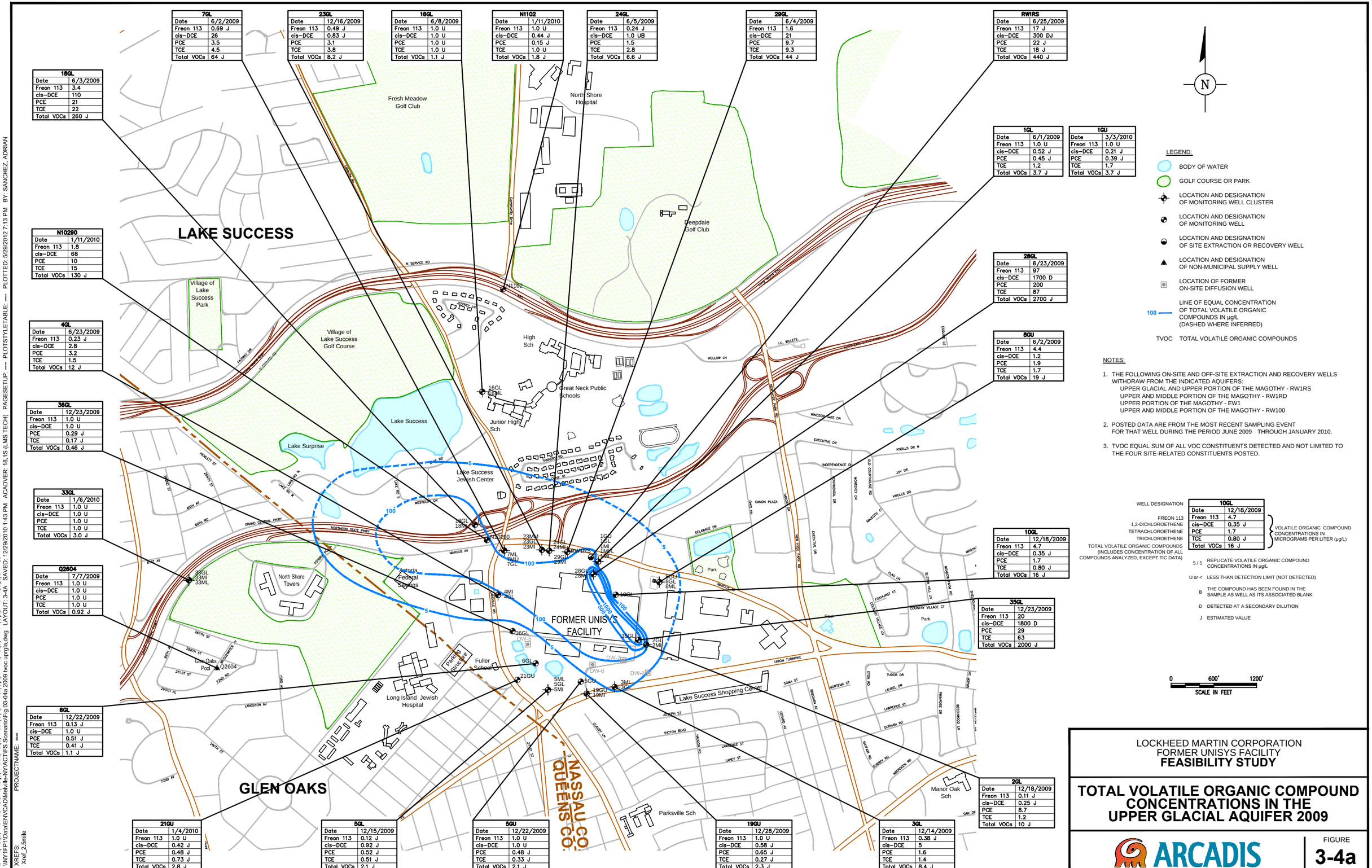
Mt
Pk
Sq
Ter
Cir



LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN THE UPPER GLACIAL AQUIFER 2009

ARCADIS

FIGURE
3-4a

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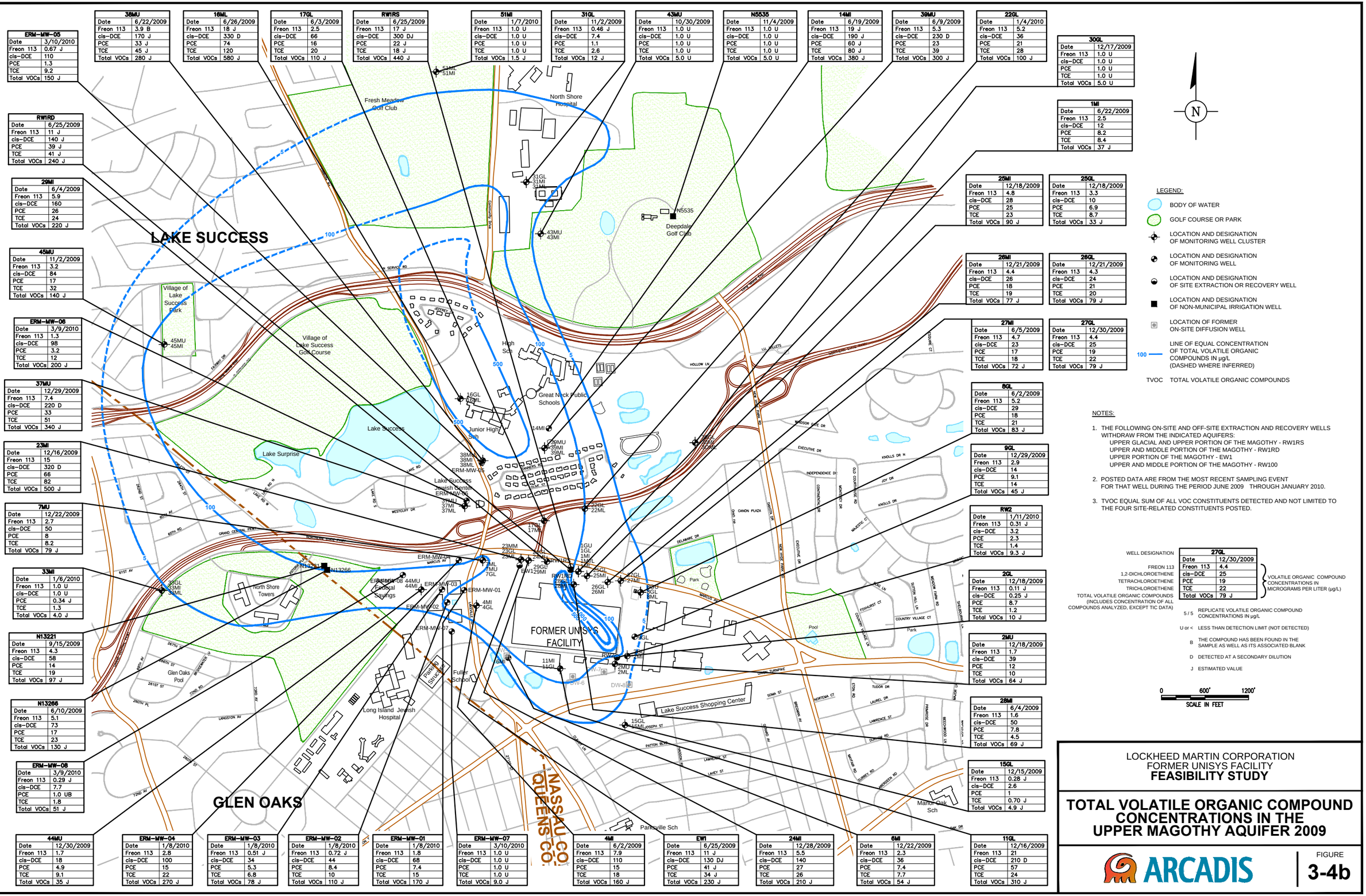
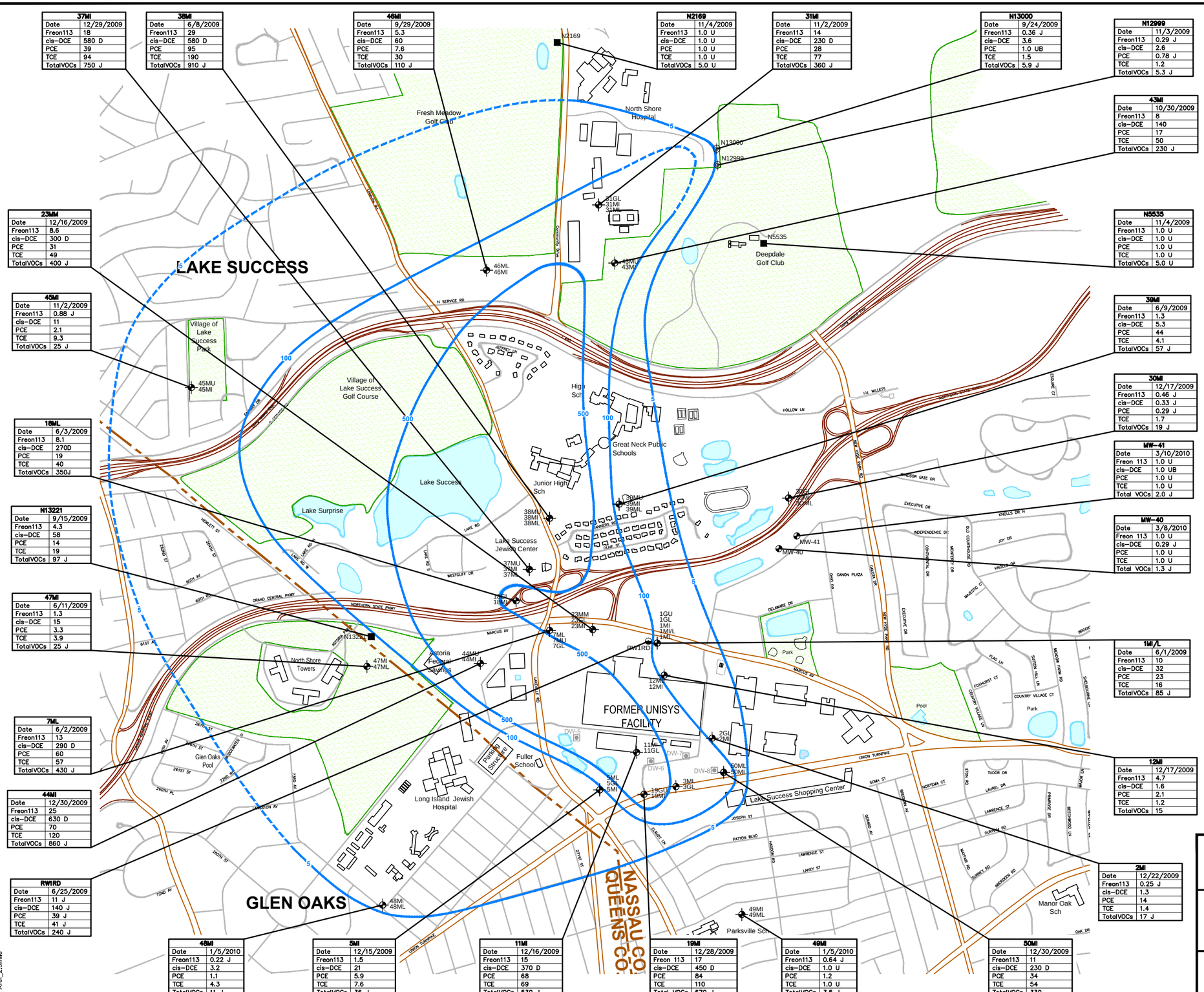
Xref_2.5mile
PROJECTNAME: ---


LAKE SUCCESS
GLEN OAKS
FORMER UNISYS FACILITY
Village of Lake Success Park
Village of Lake Success Golf Course
Fresh Meadow Golf Club
North Shore Hospital
Deepdale Golf Club
Great Neck Public Schools
High Sch
Junior High Sch
Lake Success
Lake Surprise
Lake Success Jewish Center
North Shore Towers
Glen Oaks Pool
Long Island Jewish Hospital
Fuller School
Parkville Sch
Lake Success Shopping Center
Manor Oak Sch
Park
Pool
NASSAU CO.
QUEENS CO.
LAKE RD
LAKE RD N
LAKE RD S
HILLSIDE AV
UNION TURNPIKE
JERICHO TPKE
NORTHERN BLVD
GRAND CENTRAL PKWY
N SERVICE RD
HOLLOW LN
WINDSOR PLACE DR
EXECUTIVE DR
INDEPENDENCE DR
KNOLLS DR N
JOY DR
DELAWARE DR
CANON PLAZA
MARCUS AV
LAKEVILLE RD
LAKEVILLE CT
FOXHURST CT
COUNTRY VILLAGE CT
COUNTRY VILLAGE LN
SUTTON HILL LN
MEADOW FARM RD
SHELBOURNE LN
TUDOR DR
LAUREL DR
LAWRENCE ST
DURHAM RD
PRIMROSE DR
WESTMORE DR
WILLOW DR
ELTON DR
MAYFAIR RD
SURREY RD
ABERDEEN RD
OAK DR
SOMA ST
NORTMA CT
BERGMAN AV
GRAHAM AV
PATTON BLVD
MADISON ST
LAFAYETTE ST
JOSEPH ST
GRANT CT
CHESTER CT
WESTCLIFF DR
CONCORD DR
MONTCLAIR DR
OLD COUNTRY RD
MAJESTIC CT
NEW YORK AVENUE
DENTON AV
DENTON CT
DENTON PL
ERMINE ST
ERMINE CT
ERMINE PL
ERMINE AV
ERMINE CIR
ERMINE DR
ERMINE LA
ERMINE RD
ERMINE WAY
ERMINE TER
ERMINE WALK
ERMINE PARK
ERMINE GROVE
ERMINE HILL
ERMINE VALLEY
ERMINE MEADOW
ERMINE FOREST
ERMINE GARDEN
ERMINE ORCHARD
ERMINE VILLAGE
ERMINE CROSSING
ERMINE BRIDGE
ERMINE TUNNEL
ERMINE RIVER
ERMINE LAKE
ERMINE POND
ERMINE SPRING
ERMINE WELL
ERMINE SPRING
ERMINE WELL
ERMINE SPRING
ERMINE WELL



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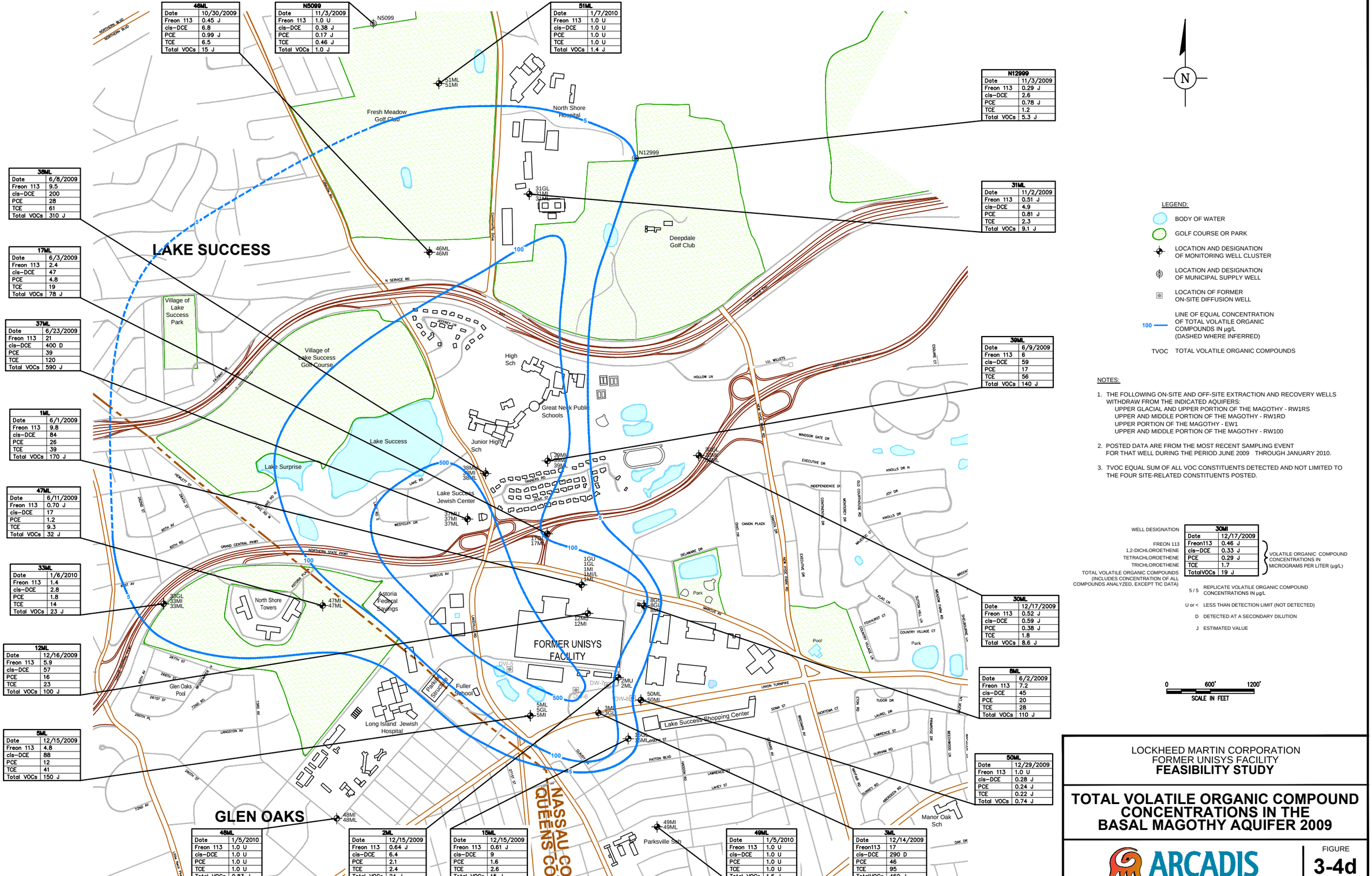

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN THE BASAL MAGOTHY AQUIFER 2009

ARCADIS

FIGURE
3-4d

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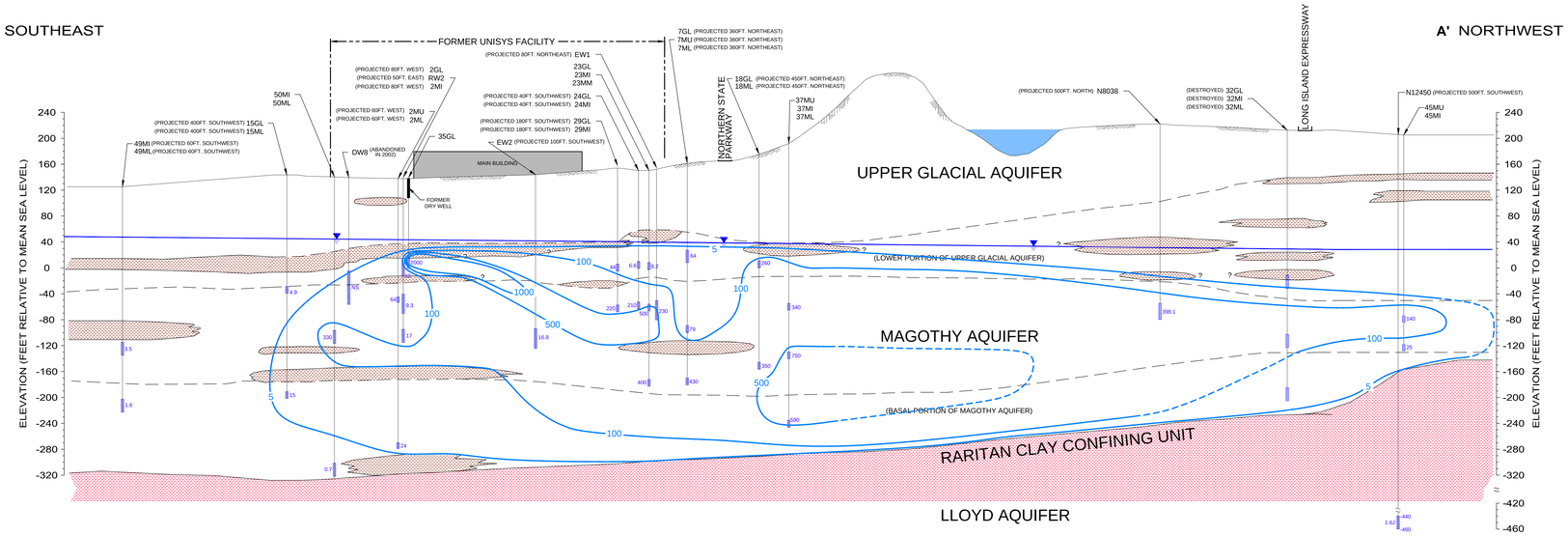
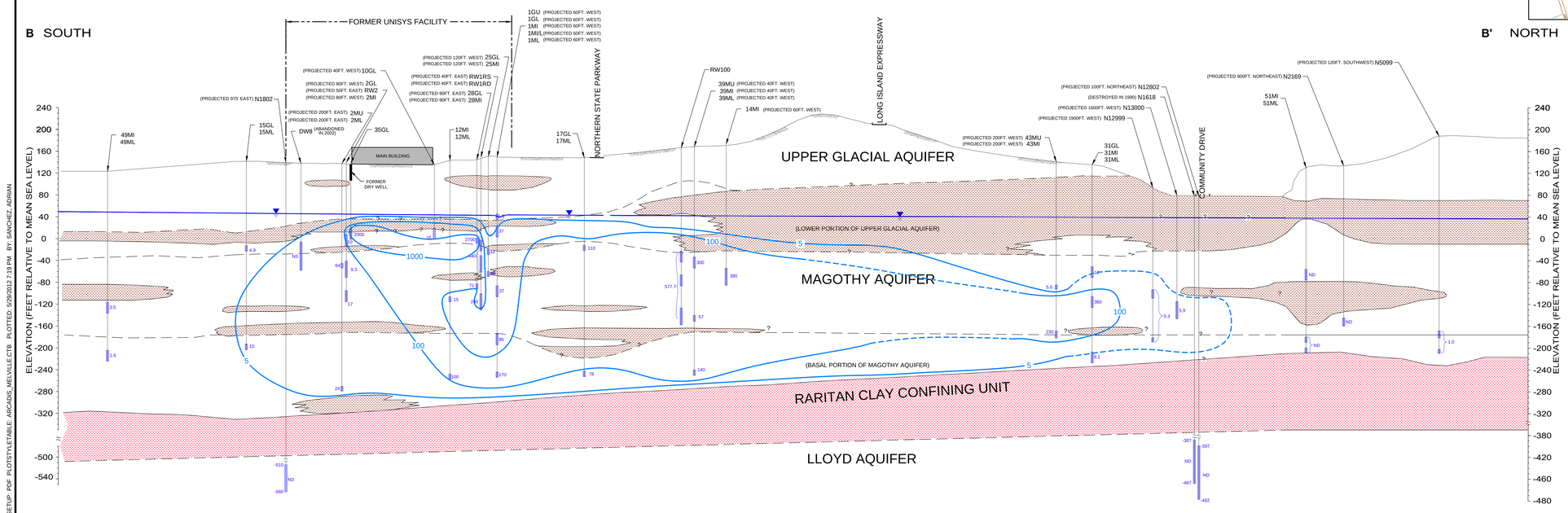
USER:ESTEBAEVCADAdmin-NY-CIVIL3 Screen:vfg:09:55:56am ARC Ver:.dwg LAYOUT:3-5 SAVED: 12/29/2010 7:09 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: PDF PLOTSTYLETABLE: ARCADIS_MELVILLE.CTB PLOTTED: 5/29/2012 7:19 PM BY: SANCHEZ, ADRIAN
PROJECTNAME: B0038102.0000.00010
XREFS: Xref_sp/Visual-2012
Xref_2_Smke

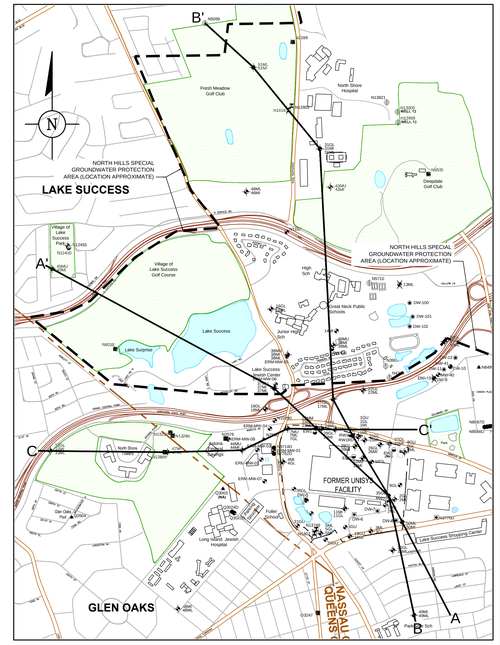
A SOUTHEAST — A' NORTHWEST



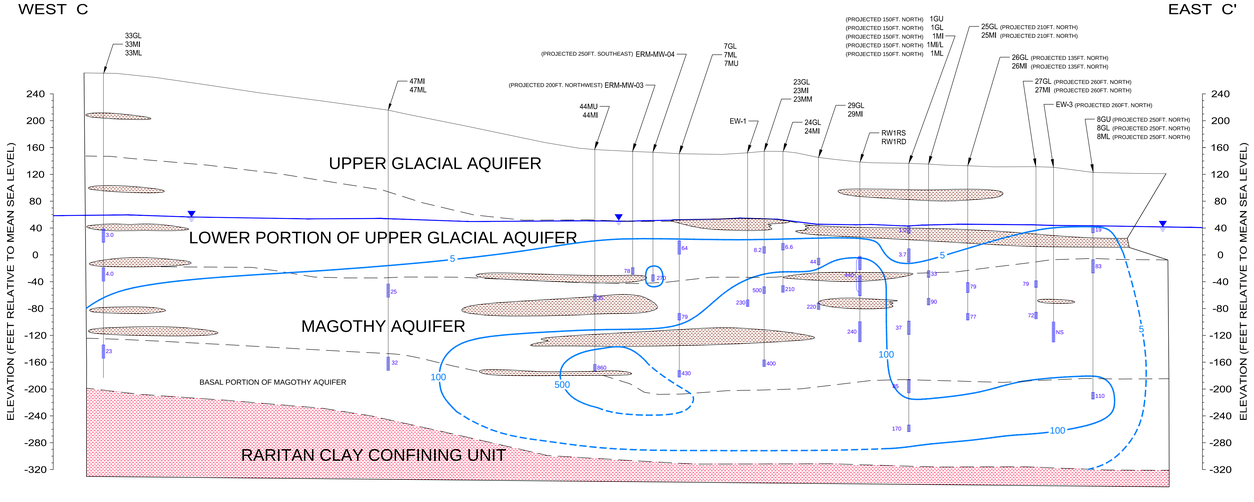
B SOUTH — B' NORTH



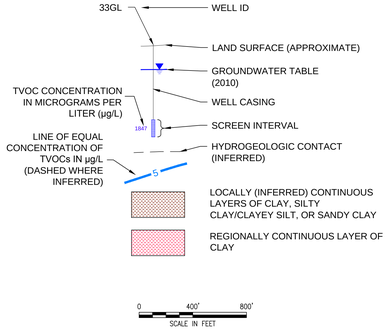
KEY PLAN SHOWING CROSS-SECTIONS



WEST C — EAST C'



LEGEND



NOTES:

1. UPPER GLACIAL AQUIFER DEPOSITS CONSIST OF TILL (COMPOSED OF UNSORTED CLAY, SAND AND BOULDERS) AND OUTWASH (COMPOSED OF STRATIFIED FINE TO COARSE SAND AND GRAVEL, WITH LOCALIZED CLAY AND SILT LAYERS).
2. LOWER PORTION OF UPPER GLACIAL AQUIFER CONSISTS PRIMARILY OF VERY FINE TO FINE SAND WITH SILT AND CLAY.
3. MAGOTHY AQUIFER DEPOSITS CONSIST OF FINE TO MEDIUM SAND, SILTY SAND AND CLAYEY SAND INTERBEDDED WITH LENSES AND LAYERS OF COARSE SAND AND SANDY AND SOLID CLAY.
4. BASAL PORTION OF MAGOTHY AQUIFER GENERALLY COMPOSED OF FINE TO COARSE SAND AND GRAVEL LOCALLY INTERBEDDED WITH SILTY SAND AND CLAY.
5. GENERALIZED WATER TABLE SURFACE IS BASED ON POTENTIOMETRIC SURFACE CONFIGURATION OF THE UPPER GLACIAL AQUIFER ON JANUARY 2010.
6. TOTAL VOLATILE ORGANIC COMPOUND (TVOC) CONCENTRATIONS FROM ANALYSIS OF GROUNDWATER SAMPLES COLLECTED, EXCEPT TENTATIVELY IDENTIFIED COMPOUNDS.
7. TVOC ROUNDED TO THE NEAREST WHOLE NUMBER. METHOD DETECTED LIMIT IS 1 MICROGRAM PER LITER (µg/L) UNLESS INDICATED OTHERWISE.
8. NS INDICATES NOT SAMPLED DURING TIME PERIOD DESCRIBED (JUNE 2009 - JANUARY 2010)
9. DW DESIGNATES DIFFUSION WELL
   EW DESIGNATES EXTRACTION WELL
   RW DESIGNATES RECOVERY WELL
10. REPLICATE SAMPLES COLLECTED AT: 31MI, 37MI, 39MI, RW1RD, 22GL.
11. WELLS N1802, N1618, N12802, AND N12450 NO SITE-RELATED CONSTITUENTS OF POTENTIAL CONCERN DETECTED (ND - NOT DETECTED)
12. TVOC EQUAL SUM OF ALL VOC CONSTITUENTS DETECTED AND NOT LIMITED TO THE FOUR SITE RELATED CONSTITUENTS OF POTENTIAL CONCERN, WHICH INCLUDE: TRICHLOROETHENE, TETRACHLOROETHENE, CIS-1,2-DICHLOROETHENE, AND FREON-113.

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

HYDROGEOLOGICAL CROSS-SECTIONS A-A', B-B', AND C-C' SHOWING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS - 2009

ARCADIS

FIGURE **3-5**

NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT

0 1600’ 3200’

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 1 - NO ACTION

ARCADIS

FIGURE
7-1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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PROJECTNAME: ----
XREFS:
Xref 2.5mile

25 - MILE RADIUS
20 - MILE RADIUS
15 - MILE RADIUS
LAKE SUCCESS
GLEN OAKS
FORMER UNISYS FACILITY
Lakeville School
Village of Lake Success Park
Village of Lake Success Golf Course
Lake Success
Lake Surprise
Lake Success Jewish Center
High Sch
Great Neck Public Schools
Junior High Sch
North Shore Hospital
Deepdale Golf Club
Deepdale Golf Club
North Shore Towers
Joseph Pedrazzi School
Pulitzer Park
Long Island Jewish Hospital
Lake Success Shopping Center
Parkville Sch
Manor Oak Sch
Middle Neck Rd
Community Park
Pool
Park
Pool
Pool
Pool

NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600’ 3200’

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 2b

ARCADIS

FIGURE
7-3

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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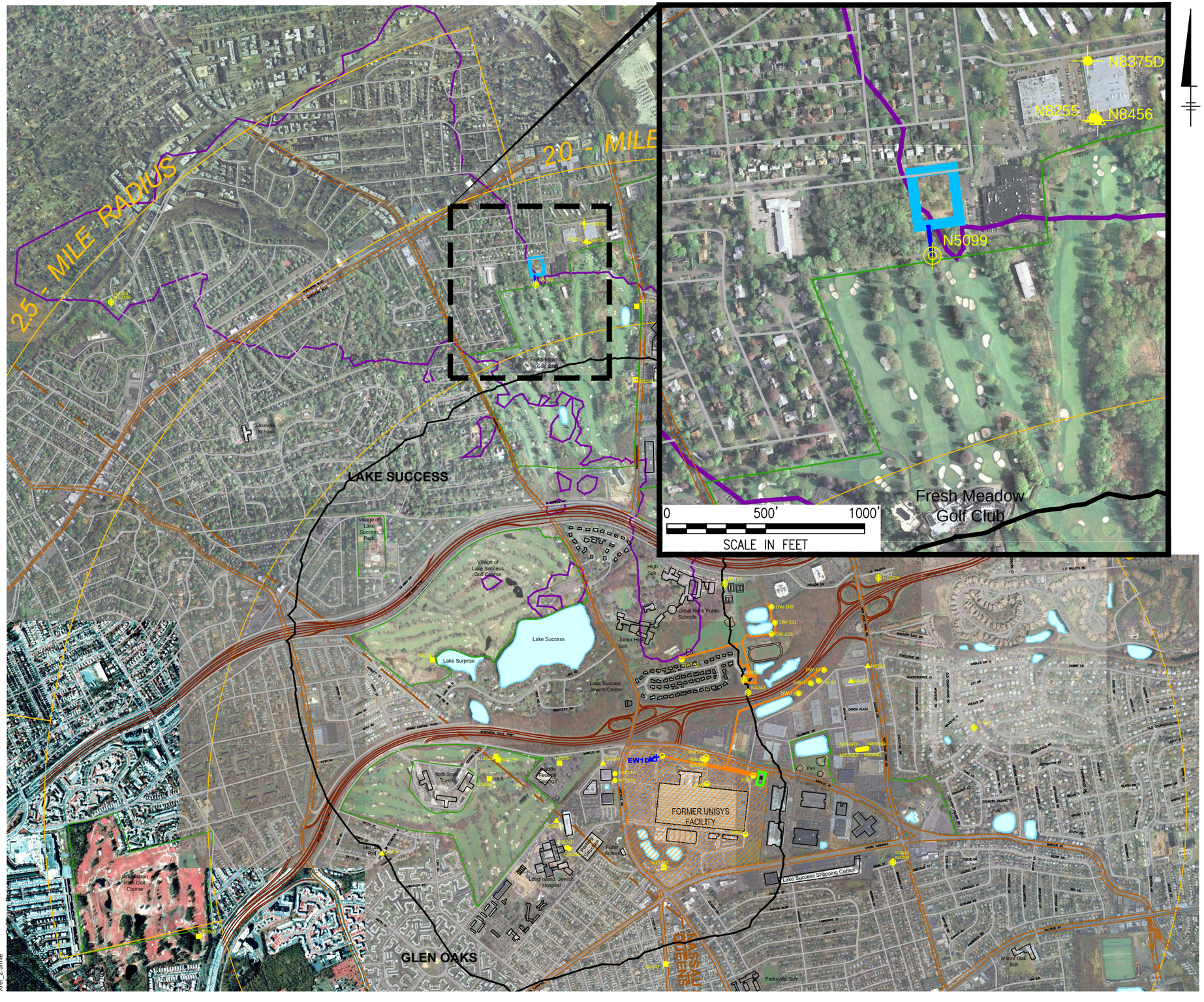
PROJECTNAME: ----
XREFS:
Xref_2.5mile



NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 2c

ARCADIS

FIGURE
7-4

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Melville-NY\ACTIFS Scenario\Fig 07-04 Alt2c.dwg LAYOUT: 7-4 SAVED: 12/29/2010 8:01 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 5/30/2012 1:03 PM BY: SANCHEZ, ADRIAN
PROJECTNAME: ----
XREFS:
Xref_2.5mile

NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600’ 3200’

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 3a

ARCADIS

FIGURE
7-5

CITY:(Req'd) DIV/GROUP:(Req'd) DB:(Req'd) LD:(Opt) PIC:(Opt) PM:(Req'd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Melville-NY\ACTIFS Scenario\Fig 07-05 Alt3a.dwg LAYOUT: 7-5 SAVED: 12/29/2010 8:03 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 5/30/2012 1:14 PM BY: SANCHEZ, ADRIAN
XREFS:
Xref_2_5mile
PROJECTNAME: ----

NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600’ 3200’

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 3b

ARCADIS

FIGURE
7-6

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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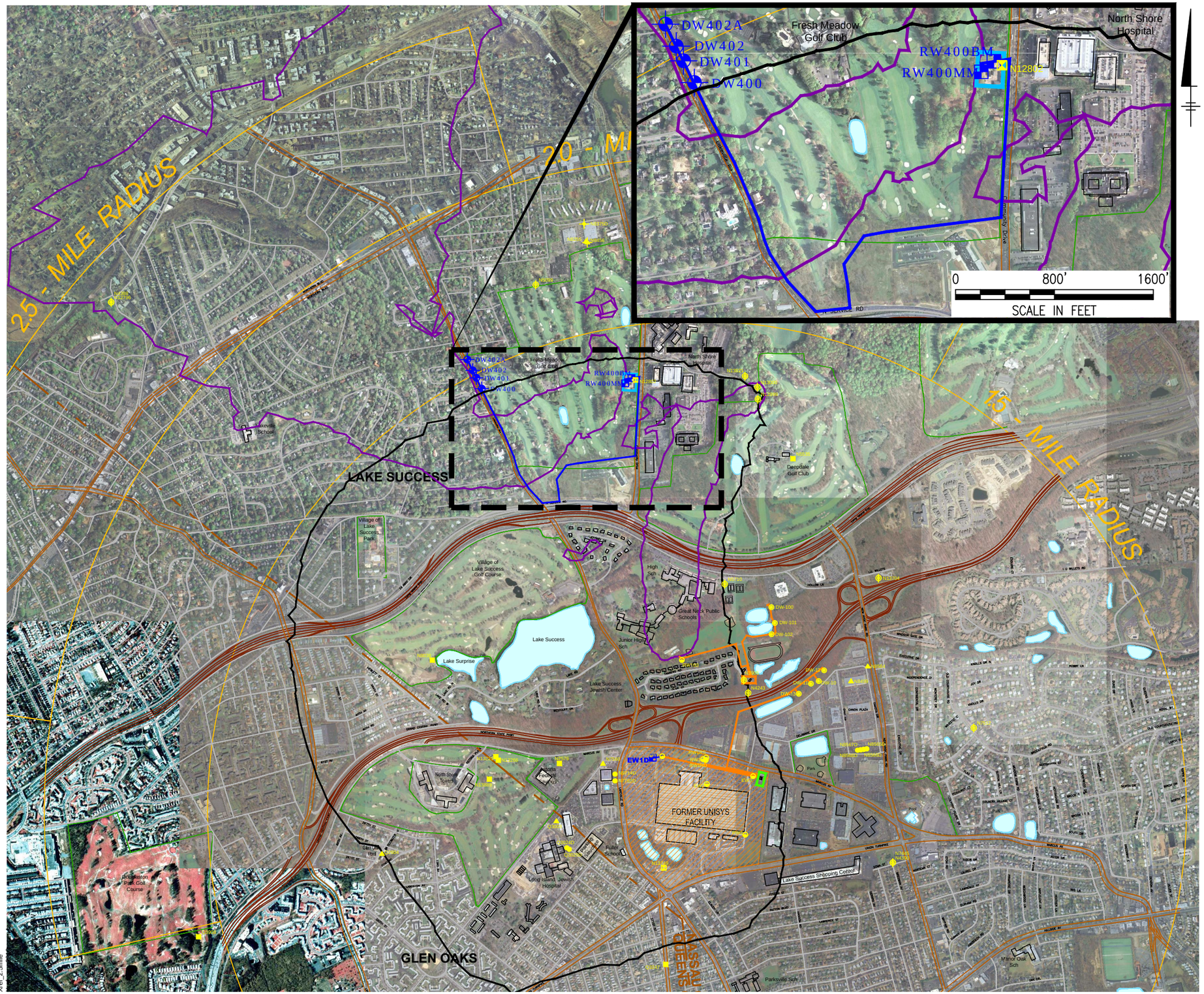
PROJECTNAME: ----



NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600' 3200'

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 4a

ARCADIS

FIGURE
7-7

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Melville-NY\ACTIFS Scenario\Fig 07-07 Alt4a.dwg LAYOUT: 7-7 SAVED: 12/29/2010 8:08 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 5/30/2012 1:53 PM BY: SANCHEZ, ADRIAN
XREFS:
Xref 2_5mile
PROJECTNAME: ----

NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600’ 3200’

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 4b

ARCADIS

FIGURE
7-8

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF* PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 5/30/2012 1:57 PM BY: SANCHEZ, ADRIAN
G:\ENVCAD\Melville-NY\ACTIFS Scenario\Fig 07-08 Alt4b.dwg LAYOUT: 7-8 SAVED: 12/29/2010 8:10 PM ACADVER: 18.1S (LMS TECH)
XREFS: PROJECTNAME: ----
Xref 2_5mile

NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600’ 3200’

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 4c

ARCADIS

FIGURE
7-9

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Melville-NY\ACTIFS Scenario\Fig 07-09 Alt4c.dwg LAYOUT: 7-9 SAVED: 12/29/2010 8:13 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 5/30/2012 2:08 PM BY: SANCHEZ, ADRIAN
PROJECTNAME: ----
XREFS:
Xref_2_5mile

NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600’ 3200’

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 4d

ARCADIS

FIGURE
7-10

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(On|Off|Frz)=*OFF*=REF* ACADVER: 18.1S (LMS TECH) PAGESETUP: ----
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XREFS:
Xref_2_5mile

25 - MILE RADIUS
20 - MILE RADIUS
15 - MILE RADIUS
LAKE SUCCESS
GLEN OAKS
NEW HYDE PARK
TREATMENT SYSTEM VLSGC
RW301D
DW301
DW300
RW401D
RW401M
DW405X
DW405
DW404
DW404A
EW1D
DW-1
DW-2
DW-3
DW-100
DW-101
DW-102
Village of Lake Success Park
Village of Lake Success Golf Course
Lake Success
Lake Surprise
Lake Success Jewish Center
Gray Gables
North Shore Hospital
Deepdale Golf Club
Grace Church
Gray Gables Golf Club
Gray Gables Park
Gray Gables Preschool
Gray Gables Tennis
Gray Gables Pool
Gray Gables Playground
Gray Gables Basketball
Gray Gables Baseball
Gray Gables Soccer
Gray Gables Football
Gray Gables Lacrosse
Gray Gables Field Hockey
Gray Gables Volleyball
Gray Gables Softball
Gray Gables Cricket
Gray Gables Rugby
Gray Gables Ultimate Frisbee
Gray Gables Ice Hockey
Gray Gables Ice Skating
Gray Gables Roller Hockey
Gray Gables Roller Skating
Gray Gables Skateboarding
Gray Gables BMX
Gray Gables Mountain Biking
Gray Gables Trail Running
Gray Gables Cross Country
Gray Gables Track and Field
Gray Gables Swimming
Gray Gables Diving
Gray Gables Water Polo
Gray Gables Synchronized Swimming
Gray Gables Rowing
Gray Gables Sailing
Gray Gables Canoeing
Gray Gables Kayaking
Gray Gables Fishing
Gray Gables Hunting
Gray Gables Archery
Gray Gables Shooting
Gray Gables Golf

NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELL WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600’ 3200’

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 4f

ARCADIS

FIGURE
7-12

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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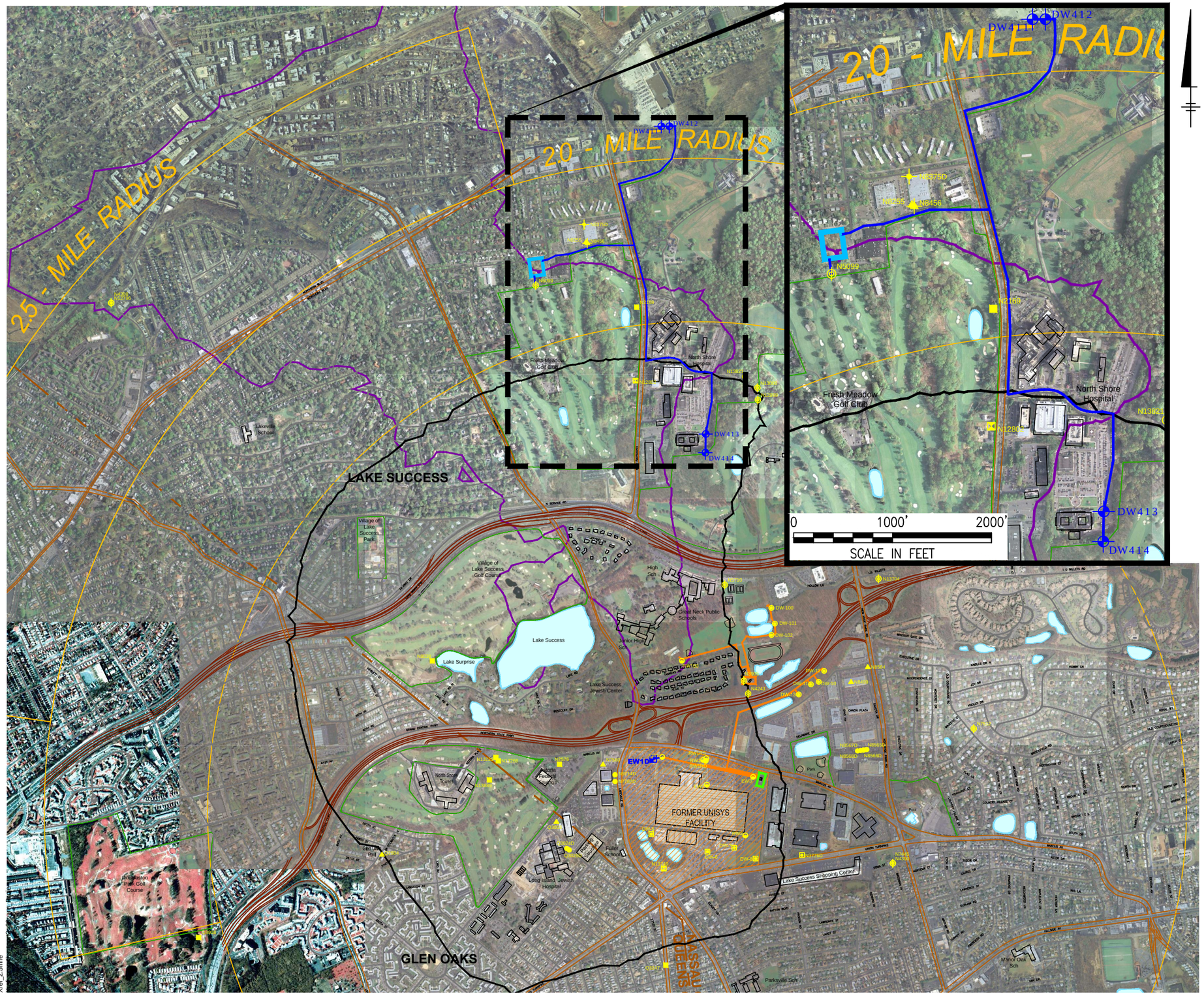
PROJECTNAME: ----



NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 4g

ARCADIS

FIGURE
7-13

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
\\NY1FP1\Data\ENVCAD\Melville-NY\ACTIFS Scenario\Fig 07-13 Alt4g.dwg LAYOUT: 7-13 SAVED: 5/30/2012 3:00 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 5/30/2012 3:13 PM BY: SANCHEZ, ADRIAN
XREFS:
Xref_2_5mile
PROJECTNAME: ----

NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
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- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
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- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600' 3200'

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 4h

ARCADIS

FIGURE
7-14

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*OFF=*REF*
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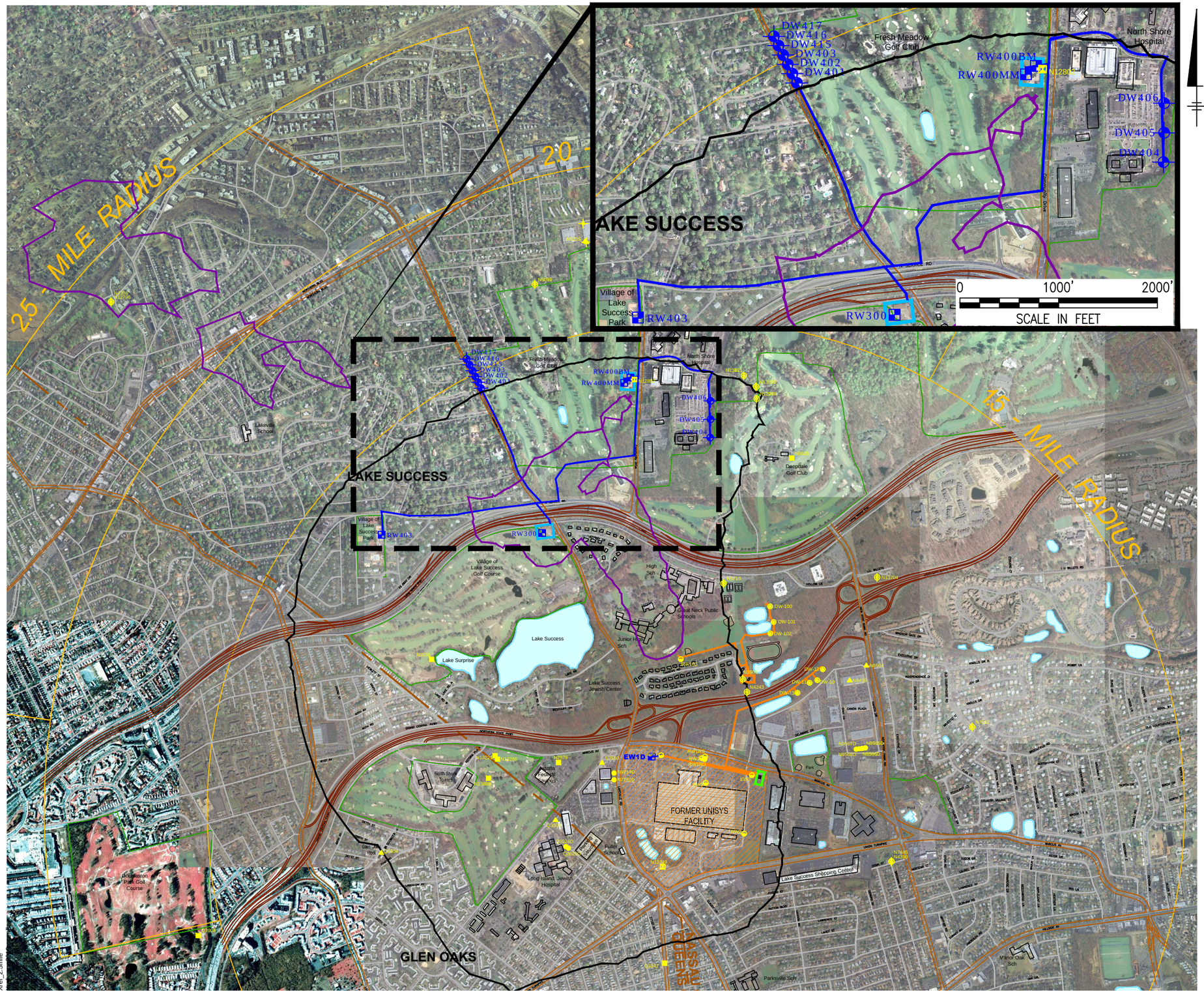
XREFS:
Xref_2_5mile
PROJECTNAME: ----



NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
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- PROPOSED DIFFUSION WELL
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- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
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- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 5a

ARCADIS

FIGURE
7-15

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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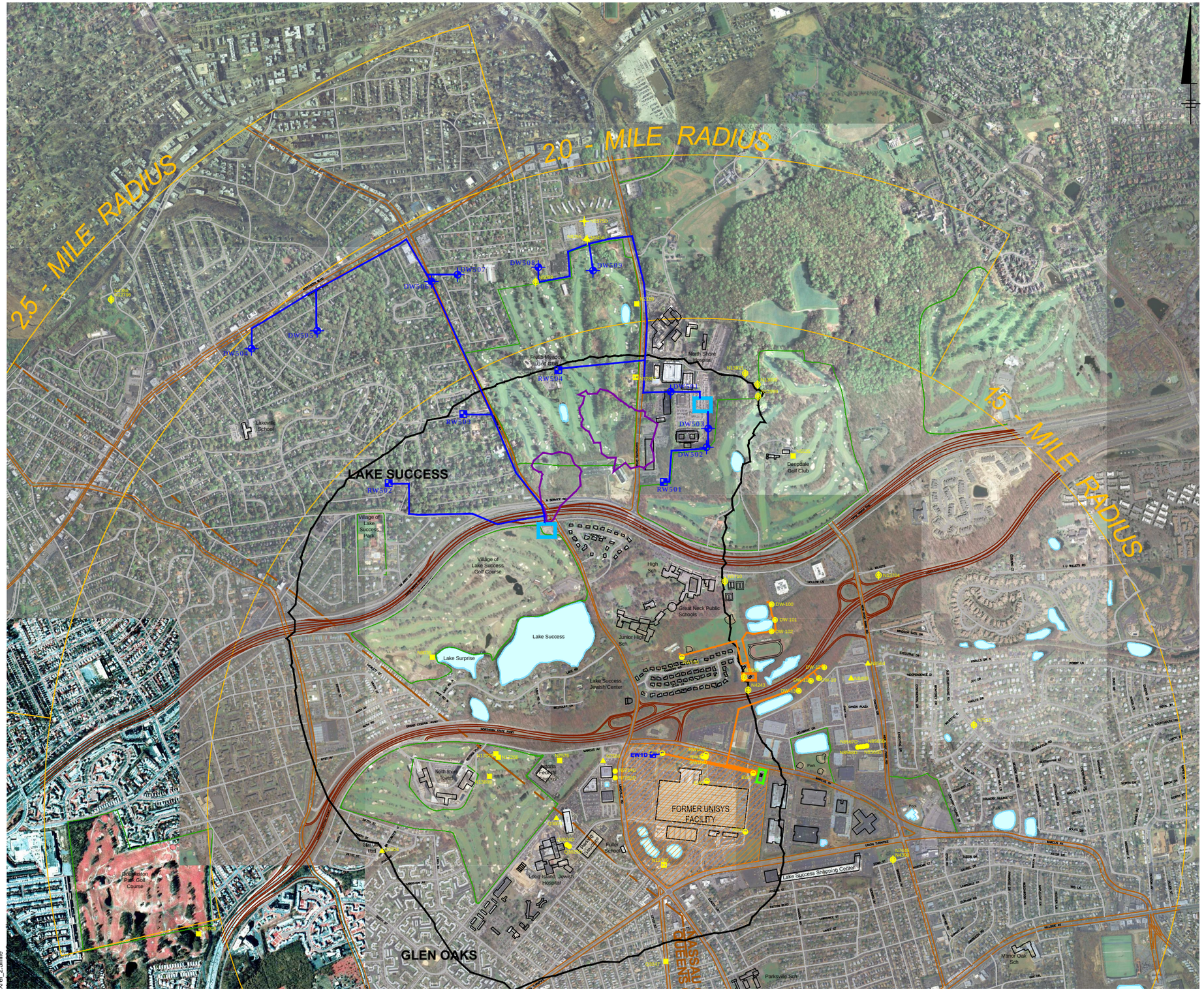
PROJECTNAME: ----
XREFS:
Xref_2_5mile



NOTE

1. THE FOLLOWING ON-SITE EXTRACTION AND RECOVERY WELLS WITHDRAW FROM THE INDICATED AQUIFERS:
   - UPPER GLACIAL AND UPPER PORTION OF THE MAGOTHY - RW1RS
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW1RD
   - UPPER PORTION OF THE MAGOTHY - EW1
   - UPPER AND MIDDLE PORTION OF THE MAGOTHY - RW100

LEGEND:

- BODY OF WATER
- SITE EXTRACTION AND RECOVERY WELLS
- REMEDIATION SYSTEM DIFFUSION WELL
- MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL SUPPLY WELL
- NON-MUNICIPAL IRRIGATION WELL
- NON-MUNICIPAL DIFFUSION WELL
- LLOYD AQUIFER MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL SUPPLY WELL
- LLOYD AQUIFER NON-MUNICIPAL DIFFUSION WELL
- PROPOSED DIFFUSION WELL
- PROPOSED RECOVERY WELL
- EXISTING IRM TREATMENT SYSTEM AND COMPOUND
- NEW TREATMENT SYSTEM AND COMPOUND
- EXISTING OU-1 TREATMENT SYSTEM AREA AND COMPOUND LOCATION
- GROUNDWATER 30 YEARS MODEL PREDICTED 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- CURRENT 5 ug/L TVOC CONCENTRATION CONTOUR LINE
- EXISTING SYSTEM PIPING LAYOUT
- PROPOSED SYSTEM PIPING LAYOUT

0 1600' 3200'

SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

ALTERNATIVE 5b

ARCADIS

FIGURE
7-16

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
\\NY1FP1\Data\ENVCAD\Melville-NY\ACTIFS Scenario\Fig 07-16 All5b.dwg LAYOUT: 7-16 SAVED: 12/29/2010 8:40 PM ACADVER: 18.1S (LMS TECH)
XREFS: PROJECTNAME: ----
Xref_2_5mile PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 5/30/2012 3:28 PM BY: SANCHEZ, ADRIAN

Appendix A— Groundwater Model Documentation Report

REPORT

OU-2 Feasibility Study Groundwater Remediation Simulation Report

Feasibility Study Report
Operable Unit No. 2 for the Unisys Site,
Great Neck, NY

May 2012

CDM Smith

Table of Contents

Section 1 Introduction

1.1 Background 1-1
1.2 Summary of Scope 1-1
1.3 Organization of Report 1-2

Section 2 Groundwater Flow Simulations

2.1 No Action Groundwater Flow Simulation 2-1
2.2 Feasibility Study Groundwater Remediation Simulations 2-1

Section 3 Solute Transport Simulations

3.1 Approach 3-1
3.2 Modeling Code 3-2
3.3 Transport Properties 3-2
3.4 Starting Plume 3-2
3.5 Source Term 3-3
3.6 OU-2 Remediation Investigation No-Action Scenario 3-3
3.7 OU-2 Feasibility Study Scenarios 3-4
3.7.1 Scenario 1 3-4
3.7.2 Scenario 2 Series 3-5
3.7.3 Scenario 3 Series 3-5
3.7.4 Scenario 4 Series 3-5
3.7.5 Scenario 5 Series 3-6
3.7.6 Simulated Mass Removal and Receptor Impacts 3-6
3.8 Summary 3-6

Section 4 References

List of Figures

1-1 Site Location Map .....
2-1 Pumping Wells in the Upper Glacial and Magothy Aquifers Near Site – No Action Scenario
2-2 Simulated Water Table Elevation – Scenario 1 (No Action) .....
2-3 Groundwater Contours, Flow Directions and Well Locations – Scenario 1 (No Action) .....
2-4 Groundwater Contours, Flow Directions and Well Locations – Scenario 2A .....
2-5 Groundwater Contours, Flow Directions and Well Locations – Scenario 2B .....
2-6 Groundwater Contours, Flow Directions and Well Locations – Scenario 2C .....
2-7 Groundwater Contours, Flow Directions and Well Locations – Scenario 3A .....
2-8 Groundwater Contours, Flow Directions and Well Locations – Scenario 3B .....
2-9 Groundwater Contours, Flow Directions and Well Locations – Scenario 4A .....

2-10 Groundwater Contours, Flow Directions and Well Locations – Scenario 4B
2-11 Groundwater Contours, Flow Directions and Well Locations – Scenario 4C
2-12 Groundwater Contours, Flow Directions and Well Locations – Scenario 4D
2-13 Groundwater Contours, Flow Directions and Well Locations – Scenario 4E
2-14 Groundwater Contours, Flow Directions and Well Locations – Scenario 4F
2-15 Groundwater Contours, Flow Directions and Well Locations – Scenario 4G
2-16 Groundwater Contours, Flow Directions and Well Locations – Scenario 4H
3-1 Starting Plume Extent – Upper Glacial Aquifer
3-2 Starting Plume Extent – Upper Magothy Aquifer
3-3 Starting Plume Extent – Middle Magothy Aquifer
3-4 Starting Plume Extent – Basal Magothy Aquifer
3-5 Maximum Simulated TVOC Concentrations for 10 Years – No Action Scenario
3-6 Maximum Simulated TVOC Concentrations for 20 Years – No Action Scenario
3-7 Maximum Simulated TVOC Concentrations for 30 Years – No Action Scenario
3-8 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells - Scenario 1
3-9 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 2A
3-10 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 2B
3-11 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 2C
3-12 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells - Scenario 2A
3-13 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 2B
3-14 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 2C
3-15 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 3A
3-16 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 3B
3-17 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 3A
3-18 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 3B
3-19 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 4A
3-20 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 4B
3-21 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 4C
3-22 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 4D
3-23 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 4E
3-24 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 4F
3-25 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 4G
3-26 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 4H
3-27 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 4A
3-28 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 4B
3-29 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells - Scenario 4C
3-30 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 4D
3-31 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 4E
3-32 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells -

Scenario 4F
3-33 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 4G
3-34 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 4H
3-35 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 5A
3-36 Maximum Simulated TVOC Concentrations After 30 Years – Scenario 5B
3-37 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 5A
3-38 Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells – Scenario 5B
3-39 Simulated Mass Removed Over 30 year Simulation Period
3-40 Simulated Pumping and Maximum Concentrations at Water Supply Receptor Wells
4-24 Groundwater Contours, Flow Directions and Well Locations – Scenario 5A
4-25 Groundwater Contours, Flow Directions and Well Locations – Scenario 5B

List of Tables

2-1 Summary of Pumping for No Action Scenario
2-2 Simulated Scenarios for OU2 Feasibility Study
3-1 Remediation Implementation Assumptions For OU-2 Feasibility Study Simulations
3-2 Summary of Mass Transport Model Properties
3-3 Simulated TVOC Concentrations at Receptor Wells for No Action Scenario
3-4 Simulated Mass Removal over 30 Years for OU2 Feasibility Study Scenarios
3-5 Summary of Simulated TVOC Plume Impacts to Receptor Wells

Section 1
Introduction

This OU-2 Feasibility Study Groundwater Remediation Simulation Report was prepared by CDM Smith for Lockheed Martin Corporation (Lockheed Martin) as part of the Groundwater Modeling Activities and the OU-2 Remediation Investigation and Feasibility Study Scope of Work for the former Unisys site located in Great Neck, New York on Long Island. The purpose of this report is to present the application of the existing groundwater flow and transport model to evaluate current and potential future groundwater flow and solute transport in the vicinity of the site in support of the OU-2 Remediation Investigation (RI) and Feasibility Study (FS). A summary of the groundwater flow model development and calibration is presented in the *Remedial Investigation Report Operable Unit No. 2 for the Unisys Site, Great Neck, NY* (ARCADIS, 2012).

1.1 Background

The former Unisys site occupies approximately 94 acres of land in Great Neck, New York. The site is located close to the Queens County/Nassau County Line near the Village of Lake Success and the Town of North Hempstead in Nassau County, New York. A site location map is shown in **Figure 1-1**.

The Unisys site was an active manufacturing facility from its startup in 1941 until approximately 1995, when manufacturing ceased. However, some assembly, integration, prototype development and testing, and/or engineering and administrative activities were still being conducted at the facility through early 1999. The facility was originally designed and built by the United States Government and was operated under a contract with Sperry Gyroscope Company (Sperry) from 1941 to 1951. In 1951, the property was sold to Sperry, which merged with Burroughs in 1986 to form the Unisys Corporation. In 1995, Loral Corporation (Loral) acquired assets of Unisys Defense Systems, a division of Unisys Corporation. In early 1996, the electronics and systems integration businesses of Loral were purchased by Lockheed Martin.

Manufacturing processes in the past at the facility included a foundry, etching, degreasing, plating, painting, machining and assembly. Chemicals used during these manufacturing processes included halogenated and non-halogenated hydrocarbon solvents, cutting oil, paints and fuel oils. The site is no longer an active manufacturing facility; the property was sold by Lockheed Martin in early 2000 to i.park, Lake Success, LLP (i.park), which has converted the buildings to commercial rental space. The site is currently owned by Apollo Lake Success Property, LLC and 1111 Marcus Avenue Unit 2 Owner, LLC.

1.2 Summary of Scope

Groundwater flow and solute transport models were developed as part of the OU-2 Remedial Investigation (RI) and Feasibility Study (FS) for the former Unisys site. The flow model was based on the stratigraphy and hydrogeologic properties represented in the Nassau County regional model (NCRM) and supplemented with local data from site and other nearby boring logs. The groundwater flow model was calibrated to transient conditions from 1940-2007. A solute transport model was also developed to evaluate potential migration of site related volatile organic compounds (VOCs).

1.3 Organization of Report

The remainder of this report presents the application of the groundwater flow model for the OU-2 Feasibility Study. Section 2.0 presents the groundwater flow simulation results for the OU-2 Feasibility Study alternatives. Section 3.0 presents solute transport modeling results for the OU-2 Feasibility Study alternatives. References used in developing the groundwater flow model and compiling this report are listed in Section 4.0

Section 2
Groundwater Flow Simulations

The calibrated groundwater flow model was used to simulate OU-2 Feasibility Study groundwater remediation alternatives, which include the No Action scenario presented in the *Remedial Investigation Report Operable Unit No. 2 for the Unisys Site, Great Neck, NY (*ARCADIS, 2012). The simulated groundwater flow fields were then used to simulate potential future groundwater plume migration under the different OU-2 Feasibility Study scenarios.

2.1 No Action Groundwater Flow Simulation

For the No Action simulation, average groundwater recharge and average 2007 public supply, industrial/irrigation and OU-1 remediation pumping were simulated. For water supply wells close to the former Unisys site, model pumping was assigned based on consultation with NYSDEC and review of individual well historical pumping records. The average 2007 pumping rates are generally within the range of reported pumping values for recent years (2005-2009). **Table 2-1** lists the simulated pumping rates for pumping wells near the site.

Figure 2-1 shows the wells in the vicinity of the former Unisys site that were assigned pumping in the no-action groundwater flow simulation. In addition to existing well operations, several assumptions were made about future operations by two of the nearby water districts and North Shore Towers:

- Water Authority of Great Neck North (WAGNN): The district has installed a third water supply well near existing wells N-12999 and N-13000. The third well, N-13821, was included in the no-action groundwater flow model simulation.
- Manhasset Lakeville Water District (MLWD): MLWD started operation of a new supply well (N-13704) located northeast of the intersection of New Hyde Park Road and the Long Island Expressway service road. This well started operating in 2011 and was included in the no-action groundwater flow simulation.
- North Shore Towers (NST): NST installed a new irrigation well (N-13889) in 2010. This well was included in the no action simulation.

Simulated head contours for the no-action scenario for the water table are shown in **Figure 2-2**.

2.2 Feasibility Study Groundwater Remediation Simulations

In addition to the OU-2 Remedial Investigation No Action simulation, the groundwater flow model was also used to simulate candidate remediation pumping scenarios for the OU-2 Feasibility Study. For these simulations average groundwater recharge, average 2007 public supply pumping, and average pumping for nearby industrial cooling and irrigation wells based on most recent data was simulated. Pumping from the new WAGNN, MLWD and NST wells discussed above was also included in the simulations. The simulated groundwater flow fields for the different alternatives were used to simulate potential future groundwater plume migration and remediation extraction for a 30 year period.

Sixteen scenarios were evaluated for the OU-2 Feasibility Study. For all the scenarios, it was assumed that treated groundwater would be reinjected into the subsurface, as is being done in the OU-1 remediation system. An overview of the scenarios is presented below:

- **Scenario 1**: OU-2 Feasibility Study Scenario 1 is the same as the OU-2 Remediation Investigation No Action scenario, and consists of OU-1 pumping and diffusion only.
- **Scenario 2 Series**: Scenario 2A, Scenario 2B and Scenario 2C all have the OU-1 remediation system and the OU-2 IRM pumping and diffusion throughout the 30 year simulation period. In Scenario 2B and Scenario 2C, expanded OU-1 pumping is simulated with additional deep pumping from a new basal Magothy well. In Scenario 2C, MLWD well N-5099 pumps 1,200 gpm as opposed to 600 gpm which was assigned to the well in the other simulations. The assumption under Scenario 2C is that the water will be treated and added to the distribution system.

  Scenario 2B was developed to increase the hydraulic capture within the basal Magothy aquifer of the OU-1 remediation system. Simulation results indicate that a basal Magothy extraction well in the approximate vicinity of EW-1 and increased overall pumping (850 gpm) is needed to achieve essentially full capture of basal Magothy groundwater beneath OU-1. An OU-1 basal Magothy extraction well was alos included in Scenario 2C.
- **Scenario 3 Series**: Scenario 3 alternatives focus on plume capture of additional site TVOC plume mass south of the Long island Expressway.
- **Scenario 4 Series**: Scenario 4 alternatives focus on hydraulic capture of the core of the TVOC plume, and reducing impacts to nearby water supply wells. As such, some Scenario 4 alternatives include strategic placement of diffusion wells to reduce TVOC plume impacts at nearby water supply wells. Scenario 4G and Scenario 4H use MLWD N-5099 as a remediation extraction well.
- **Scenario 5 Series**: Scenario 5 alternatives focus on achieving full, or almost-full, containment over the 30 year simulation period. Scenario 5 alternatives also include strategic placement of diffusion wells to reduce TVOC plume impacts at nearby water supply wells.

In all the scenarios, except Scenario 1 and Scenario 2A, an expanded OU-1 remediation system that included additional deep pumping from a new basal Magothy well was operating throughout 30 year simulation period at a combined OU-1 total pumping rate of 850 gpm. Also, in all scenarios except Scenario 1, the OU-2 IRM was operating at rate of 500 gpm. Pumping and diffusion details for each scenario are presented in **Table 2-2**.

Remediation extraction and diffusion locations for the scenarios listed in Table 2-2, together with simulated middle Magothy head contours and groundwater flow direction arrows, are shown in **Figure 2-3** through **Figure 2-18**. The density of the arrows is based on the density of the model grid, so that in some locations the arrows appear clustered; these are areas of greater grid density (note that the density of arrows does not necessarily correspond to volumes or velocities of groundwater flow). A majority of the site related TVOCs are located in the middle and basal Magothy aquifer, and in the scenarios described above, the remediation pumping is focused on these two aquifer zones. The simulated heads in the middle Magothy and basal Magothy aquifer are generally similar. Industrial cooling well locations are not shown on these figures. In some locations, operation of these wells also

influences simulated groundwater heads. These non-municipal supply well locations are shown in Figure 2-1.

Remediation pumping and diffusion simulated from a single location in the model may in reality require multiple extraction or diffusion locations depending on the volume of flow. The number and exact locations of extraction and diffusion wells will be finalized during remedial design based on the final selection of the pumping and diffusion wells and the treatment facility. Table 2-2 lists the simulated pumping and diffusion locations, as well as the estimated number of required diffusion wells and well designations used in the main OU-2 Feasibility Study Report text.

The results of the solute transport simulations for these alternatives are presented in Section 3.7.

Section 3
Solute Transport Simulations

Solute transport simulations were performed to evaluate potential future groundwater total volatile organic compound (TVOC) migration under the no-action (OU-1 remediation pumping only) scenario and selected groundwater remediation pumping scenarios. A discussion of the model input and results is presented below.

The VOCs of concern at the site are PCE, TCE, cis-1, 2-DCE, vinyl chloride and Freon 113. For this study, solute transport of the TVOC plume, consisting of the compounds listed above, was simulated. TVOC was defined as the sum of the concentrations of PCE, TCE, cis-1, 2-DCE, vinyl chloride and Freon 113 concentrations.

A review of onsite and offsite water quality data was performed to evaluate the current lateral and vertical distribution of the TVOC plume near the site. The water quality data from site monitoring are presented in the main report.

3.1 Approach

The groundwater flow and solute transport modeling approach for completing the OU-2 Feasibility Study simulations is described below:

- The groundwater flow model was used to simulate average groundwater flow conditions under no-action and remediation pumping conditions. The pumping and recharge input for these simulations are described in the previous section. These groundwater flow simulations formed the basis for the solute transport simulations.
- The simulated groundwater flow fields for the different pumping scenarios were then used to simulate potential future groundwater plume migration to evaluate the effect of remediation pumping on the site related TVOC plume. The initial TVOC plume distribution for the solute transport simulations, discussed below, was based on recent and historical groundwater concentrations measured at site wells. The initial TVOC plume distribution used in the simulations is consistent with that presented in the OU-2 Remediation Investigation and Feasibility Study main reports.
- The OU-2 Feasibility Study transport simulations incorporated a time lag associated with remedial design and implementation. A one year time lag was assumed for the installation of the expanded OU1 system that includes a deep basal Magothy well. For scenarios with new remediation wells between Northern State Parkway (NSP) and the Long Island Expressway (LIE), a three year implementation lag was assumed. A five year implementation lag was assumed for scenarios which included new wells north of the LIE. During the one, three or five year lag period, existing OU-1 and OU-2 IRM pumping was simulated. For scenarios with the implementation delay, new remediation pumping was simulated for 29, 27 or 25 years, depending on the time lag, in order to compare scenarios at the end of a 30 year period. **Table 3-1** lists the FS scenarios and the assumed design and implementation delay period.

- The transport model results were evaluated by reviewing the simulated mass removal under each scenario, the simulated pumped groundwater concentrations at receptor wells, and the simulated TVOC plume extent at the end of a 30 year period.

3.2 Modeling Code

The solute transport simulations were performed using DYNTRACK, a fully 3-dimensional particle tracking and solute transport modeling code which is linked with DYNFLOW. In simple particle tracking mode, DYNTRACK simulates the mean advective flow path of dissolved solutes using 3-dimensional flow fields developed by DYNFLOW. In the full transport mode applied in the OU-2 Feasibility Study simulations, the code simulates the advection, dispersion, adsorption and decay processes controlling solute transport in groundwater using the random walk method.

The random walk method is a particle based approach to approximating the solution of the partial differential equation of transport. A statistically significant number of particles are tracked, wherein each particle is advected (transported) with the mean velocity within a grid element and then dispersed according to specified dispersion parameters. The concentration within a particular zone of interest is represented by the total number of particles that are present within the zone, multiplied by their associated solute mass and divided by the volume of water within the zone. A solute source can be represented as an instantaneous input of solute mass, as a continuous source for which mass is input over a specified area at a specified time-variable rate, or as specified concentrations at nodes. The random walk method limits numerical dispersion and conserves solute mass.

The DYNTRACK code has also been reviewed and tested by the International Groundwater Modeling Center (IGWMC) (van der Heijde, 1985), and has been tested and documented by CDM (CDM, 1998).

3.3 Transport Properties

Table 3-2 lists the model solute transport properties. No degradation of the TVOC mass was specified, which results in a conservative estimate of mass in the system during the simulation. A retardation coefficient of 1.0 (no retardation) was specified for the TVOC mass.

A special DYNTRACK computational option was applied to simulate transport in the basal Magothy layer to inhibit unrealistic accumulation of TVOC mass at high elevation points of the Raritan clay. Preliminary simulations indicated that TVOC mass was accumulating within areas of the Raritan clay where the upper surface of the unit protruded into the overlying Magothy layer. The site conceptual model allows for some vertical movement between the clay and the overlying basal Magothy; however, the majority of the advective flow and transport would tend to occur parallel to the interface of the two units, and under these conditions remain within the Magothy aquifer. The transport representation in the simulations was modified to reflect this understanding. Simulated results which incorporate this specific computation provide more potential for TVOC mass to reach potential receptors, and can therefore be considered a conservative representation of potential impacts to receptors.

3.4 Starting Plume

Figure 3-1, **Figure 3-2**, **Figure 3-3** and **Figure 3-4** show the estimated TVOC plume extent for the Upper Glacial, upper Magothy, middle Magothy and basal Magothy, respectively. The plume limits are defined by the estimated limit of TVOC concentrations greater than 5 µg/L. The plume limits presented in these figures are consistent with those presented in the main text, and are based on

2009/2010 sampling data and historical data. The TVOC plume distributions shown in these figures were used as the starting condition for simulating future plume migration. Additionally, groundwater concentrations between 1 and 5 µg/L were initialized in the Magothy aquifer in the area between N-5099 and the northern extent of the 5 µg/L isoline. These concentrations were added to reflect the low level VOCs that have been detected at N-5099, and the understanding that the site TVOC plume is migrating towards the well. The estimated TVOC mass contained within the plumes depicted in the figures referenced above is approximately 33,000 pounds.

3.5 Source Term

As a conservative measure, a source term was added to the mass transport simulations to represent the potential contribution of additional mass from a continuing source in the former dry well area. The mass in the source term was based on trial and error model simulation tests that were conducted to generally match simulated TVOC concentration values and trends with observed data at well 35GL, where reported TVOC concentrations are elevated and notably higher than at other Upper Glacial wells in the area. Although contaminated soils were removed as part of earlier remediation efforts, some mass may remain in the subsurface contributing to the elevated concentrations observed at 35GL. Concentrations at well 35GL have been decreasing since 2000. A 2 year half-life was assigned to the simulated dry well source based on observed reductions in groundwater concentrations at 35GL and pumped influent concentrations at the OU-1 extraction wells. Approximately 500 pounds of TVOC mass are added to the groundwater from the dry well source over the 30 year simulation period. Simulation results indicate that mass migrating from the former dry well area source is captured by the OU-1 remediation system. No other continuing TVOC sources are represented in the transport simulations.

3.6 OU-2 Remediation Investigation No-Action Scenario

Figures 3-5, 3-6 and 3-7 show the simulated TVOC concentrations after 10, 20 and 30 years, respectively, under the no-action scenario. These figures depict the maximum computed TVOC layer concentration for all model layers for a given location. This figure indicates the maximum simulated extent of the TVOC plume and where, in plan view, the highest groundwater concentrations are predicted to occur. By the end of the 30 year simulation period, a majority of the simulated mass remaining in the groundwater system is within the middle and basal portions of the Magothy aquifer.

Simulated influent concentrations at impacted pumping wells are presented **Figure 3-8. Table 3-3** lists the range of simulated concentrations at the receptor wells for the no-action scenario.

In this simulation groundwater outside the hydraulic capture zone of the OU-1 remediation system wells, which generally covers the site, migrates north/northwestward with the ambient groundwater flow direction and gradient.

The following observations are based on a review of the transport simulation results for the OU-2 Remediation Investigation No-Action Scenario:

- Assuming that the existing OU-2 IRM is turned off and no further off-site remediation is undertaken, review of the groundwater model results suggests that the leading edge of the VOC plume will be approximately 2.5 miles downgradient of the site, or approximately 7,500 feet downgradient from its 2009/2010 position, in approximately 30 years.

- The relative impact of projected plume migration on downgradient receptors is influenced by the assumed pumping rates assigned to water supply wells.
- Model simulation results indicate that three supply wells, currently unaffected by site TVOC plume concentrations greater than 5 µg/l, may be impacted by plume migration in the future (supply wells N-5099, N-4388, and N-12796). One new supply well (WAGNN well N-13821) and one new irrigation well (North Shore Towers well N13889), are also expected to be impacted shortly after installation and at startup, respectively, because the site plume has already been detected at adjacent wells. Model simulation results indicate that supply well N-7445 (WAWNC) will not be impacted by plume migration in the future.
- WAGNN well N-13821, located in the same well field as N-12999 and N-13000, is planned to begin operating in 2011. TVOCs from the site have been detected in wells N-12999 and N-13000. Model simulation results indicate that well N-13821 will most likely be impacted during the first year of operation. Simulated results indicate that the TVOC concentration at the well field may potentially reach 90 µg/L TVOC during the course of the 30 year projection period.
- Without any action to address the migration of the plume, the groundwater model projects that two additional public supply wells (N-4388 and N-12796) operated by the WAGNN will be impacted in the future by site-related compounds. Simulated TVOC concentrations greater than 1 µg/L are projected at wells N-4388 and N-12796 beginning in about 15 years and 21 years, respectively. Simulated TVOC concentrations greater than 5 µg/L are projected at wells N-4388 and N-12796 beginning in about 19 years and 25 years, respectively. At N-4388 the simulated maximum annual average concentration is expected to reach approximately 15 µg/L TVOC in about 27 years. At N-12796 the simulated maximum annual average concentration is expected to reach approximately 9 µg/L TVOC at year 30.
- MLWD N-5099 is predicted to be impacted within 1 year at a concentration of 1 to 2 µg/L TVOC without action to address the OU-2 plume. Simulated concentrations at this well remain below 5 µg/L for the first 5 years of the 30-year simulation period. A maximum concentration of approximately 160 µg/L is projected to occur in year 19.
- Irrigation wells belonging to North Shore Towers (Wells N-13221 and N-13266) and the Village of Lake Success (VLS) well (N-8038) have already been impacted by the OU-2 plume at concentrations above 5 µg/L TVOC. Well N-8038 (which had been out of service) now will operate under a contingency plan in which treatment will be provided when there is a need for the well to operate. A new irrigation well, N-13889, was installed at North Shore Towers golf course in 2010, and simulation results indicate that it will likely be impacted above 5 µg/L TVOC at start-up.
- Two irrigation wells (N-2169 and N-5535) belonging to the Fresh Meadow Country Club and Deepdale Golf Club, respectively, are present in the OU-2 area, but neither is currently impacted. Based on groundwater modeling, neither is expected to be impacted above 5µg/L TVOC in the next 30 years.

3.7 OU-2 Feasibility Study Scenarios

Solute transport simulation results for the OU-2 Feasibility Study are presented below. Table 3-4 lists the mass removal by the OU-1 remediation system, OU-2 IRM, proposed remediation wells and receptors wells for each scenario.

3.7.1 Scenario 1

OU-2 Feasibility Study Scenario 1 is the same as the OU-2 Remediation Investigation No Action scenario. The results of this simulation are presented in Section 3.6.

3.7.2 Scenario 2 Series

Scenario 2A, Scenario 2B and Scenario 2C all have the OU-1 remediation system and the OU-2 IRM pumping throughout the 30 year simulation period. In Scenario 2B and Scenario 2C, expanded OU-1 pumping is simulated with additional deep pumping from a new onsite basal Magothy well. Scenario 2C includes increased pumping from N-5099 (1,200 gpm). The assumption under Scenario 2C is that the water will be treated and added to the distribution system.

Deep pumping was introduced to OU-1 to increase the hydraulic capture within the basal Magothy aquifer of the OU-1 remediation system. Simulation results indicate that a basal Magothy extraction well in the approximate vicinity of EW-1 and increased overall pumping (850 gpm) is needed to achieve essentially full capture of basal Magothy groundwater beneath OU-1.

The maximum simulated TVOC concentrations after 30 years for Scenario 2A, Scenario 2B and Scenario 2C are presented in **Figure 3-9, Figure 3-10** and **Figure 3-11**, respectively. The simulated plume extent after 30 years is generally similar to that for Scenario 1.

Figure 3-12. Figure 3-13 and **Figure 3-14** show the simulated concentration time histories at receptor and remediation pumping wells for Scenario 2A, Scenario 2B and Scenario 2C, respectively. Although more TVOC mass is removed by remediation wells in the Scenario 2 alternatives than in Scenario 1, the simulated impact to receptor wells is generally similar to Scenario 1. Simulation results suggest that Scenario 2B and Scenario 2C remove more mass than Scenario 2A. Mass removal by the OU-1 wells is notably higher for Scenario 2B and Scenario 2C, which include a new well and a higher OU-1 pumping rate. The simulated mass removal for Scenario 2C is greater than that for Scenario 2B because of the increased pumping at N-5099 which results in increased mass removal by this well.

3.7.3 Scenario 3 Series

Scenario 3 focuses on plume capture of additional site TVOC plume mass south of the LIE. Two options were evaluated under Scenario 3. A three year implementation lag was assumed for Scenario 3A and Scenario 3B. Both Scenario 3 alternatives include an expanded OU-1 system (850 gpm) which is simulated with a one year implementation delay.

The maximum simulated TVOC concentrations after 30 years for Scenario 3A and Scenario 3B are presented in plan view in **Figure 3-15** and **Figure 3-16**, respectively. **Figure 3-17** and **Figure 3-18** show the simulated concentration time histories at receptor and remediation pumping wells for the two scenarios.

The Scenario 3 alternatives recover more TVOC mass than Scenarios 1 and 2, particularly from the high TVOC concentration zone located between the OU-2 IRM facility and the LIE. These alternatives also result in lower simulated concentrations at the downgradient MLWD N-5099 and WAGNN water supply wells (N-12999, N-13000, and N-13821).

3.7.4 Scenario 4 Series

Scenario 4 alternatives focus on hydraulic capture of the core of the TVOC plume, and on reducing impacts to nearby water supply wells. Some Scenario 4 alternatives include strategic placement of

diffusion wells in order to reduce plume impacts on WAGNN water supply wells N-12999, N- 13000 and N-13821, and MLWD well N-5099. Scenario 4G and Scenario 4H use MLWD N-5099 as a remediation extraction well.

Eight Scenario 4 alternatives were evaluated (Scenario 4A – Scenario 4F, Scenario 4G, Scenario 4H). All the Scenario 4 alternatives include an expanded OU-1 system (850 gpm) which is simulated with a one year implementation delay. A five year implementation lag was assumed for all new OU-2 Scenario 4 remediation wells.

The maximum simulated TVOC concentrations after 30 years for the Scenario 4 alternatives are presented in plan view in **Figure 3-19** to **Figure 3-26.** Figure 3-27 to **Figure 3-34** show the simulated concentration time histories at receptor and remediation pumping wells for the Scenario 4 alternatives.

In the Scenario 4 alternatives, impacts to water supply wells are reduced further, and the footprint of the 30 year plume is somewhat smaller than under the Scenario 3 alternatives. The range of TVOC mass removed from the eight Scenario 4 series alternatives only varies from 29,000 lbs to 31,600 lbs.

3.7.5 Scenario 5 Series

Scenario 5 alternatives focus on achieving full, or almost-full, containment over the 30 year simulation period and also include strategic placement of diffusion wells in order to reduce plume impacts on WAGNN water supply wells N-12999, N- 13000 and N-13821, and MLWD well N-5099.

Two Scenario 5 alternatives were evaluated. Both Scenario 5 alternatives include an expanded OU-1 system (850 gpm) which is simulated with a one year implementation delay. A five year implementation lag was assumed for all other aspects of Scenario 5 alternatives.

The maximum simulated TVOC concentrations after 30 years for Scenario 5A and Scenario 5B are presented in plan view in **Figure 3-35** and **Figure 3-36**, respectively. **Figure 3-37** and **Figure 3-38** show the simulated concentration time histories at receptor and remediation pumping wells for Scenario 5A and Scenario 5B, respectively.

In both Scenario 5A and Scenario 5B, TVOC plume impacts to N-5099 and WAGNN wells N-12999, N-13000 and N-13821 are significantly reduced. The footprint of the 30 year plume for Scenario 5B is smaller than that for Scenario 5A; however, in both scenarios the simulated TVOC plume extent at the end of 30 years is considerably smaller than for the other scenarios. In both Scenario 5A and Scenario 5B, simulated concentrations at N-5099 are below 5µg/L for the entire 30 year simulation period, and simulated concentrations at nearby WAGNN wells N-12999, N- 13000 and N-13821 fall below 5µg/L in year 7 or 8 of the simulation.

3.7.6 Simulated Mass Removal and Receptor Impacts

Scenarios were also compared on the basis of mass removal and limiting or reducing impacts to receptors. **Figure 3-39** shows the simulated mass removal by remediation wells and receptors wells for each scenario. In general, the combined total mass removed by remediation and receptor wells is similar for all the scenarios. As additional remediation wells are added north of the site, particularly in higher concentration zones, mass removal by remediation wells generally increases.

Table 3-5 lists the duration of TVOC plume impact, defined by simulated concentrations greater than or equal to 5µg/L, for potential groundwater receptors, which are comprised of water supply and golf

course wells. In some cases for scenarios that are similar to one another in terms of total pumping rate and well placement, there are small differences in the years of impact at a given well. This is usually the case when simulated receptor concentrations are just below 5µg/L in one scenario, and just above below 5 µg/L in another scenario.

Figure 3-40 shows the simulated maximum concentrations at the water supply receptor wells and the total remediation pumping rate from new wells (excluding existing OU-1 and OU-2 pumping) for each scenario.

3.8 Summary

The following observations are based on a review of the transport simulation results for the OU-2 Feasibility Study scenarios:

- The combined total mass removed, by remediation and receptor wells, is similar for all sixteen scenarios, varying only from 29,000 lbs to 32,400 lbs. Generally, as additional remediation wells are added north of the site, particularly in higher concentration zones, mass removal by remediation wells increases and mass removal by receptor wells decreases.
- Strategically sited diffusion wells can be effective in reducing plume impacts to receptor wells. Simulation results indicate that diffusion wells placed in the Fresh Meadow Golf Course parking lot, in combination with groundwater extraction from the MLWD N-12802 parcel (RW400), are effective measures in limiting TVOC plume impacts to N-5099 in Scenario 4A and Scenario 5A. Likewise, the placement of diffusion wells in the southeastern portion of the North Shore Hospital property on Community Drive reduces the TVOC plume impacts to WAGNN wells N-12999, N-13000 and N-13821.
- In terms of pumping locations north of the LIE, a majority of the locations evaluated were generally similar in terms of effectiveness. As such, cost and access considerations may factor more importantly into the decision for final pumping locations.
- Pumping patterns of nearby extraction wells, particularly water supply wells, can affect the effectiveness of plume capture. During remedial design, final remediation pumping rates will be identified based on the final placement of the remediation wells and the expected pumping patterns of nearby water supply wells.
- Comparing the simulated maximum concentrations at receptor wells is one way to evaluate the effectiveness of the different scenarios in reducing impacts to receptors. Simulated results for Scenarios 4A, 4D, 5A, and 5B indicate that under these scenarios impacts to MLWD well N-5099 and WAGNN wells N-12999, N-13000 and N-13821 are eliminated or significantly reduced in comparison to other scenarios.
- The groundwater flow and solute transport model developed for the OU-2 Remedial Investigation and Feasibility Study was used to assess the potential mass transport of TVOCs over the generally accepted 30-year planning period. The model incorporates historical information as well as data generated for the Remedial Investigation, and reflects the current understanding of the groundwater flow system near the site. If additional data become available or if significant advances in the science of computer modeling occur in the future, it may be necessary to revise the model and reevaluate the migration of the site related TVOCs.

Judgments regarding whether it is necessary to update the model and to rerun certain scenarios should be made during the 5-year reviews that the NYSDEC will conduct over the next 30 years.

A detailed discussion and comparison of the OU-2 Feasibility Study scenarios is also presented in the main portion of the OU-2 Feasibility Study report.

Section 4
References

ARCADIS. 2012. *Remedial Investigation Report Operable Unit No. 2 for the Unisys Site, Great Neck, NY*. May 2012.

Buxton, Herbert T.; Shernoff, Peter K. 1999. *Ground-Water Resources of Kings and Queens Counties, Long Island, New York.* WSP 2498.

Buxton, Herbert T.; Smolensky, Douglas A. 1999. *Simulation of the Effects of Development of the Ground-Water Flow System of Long Island, New York.* WRIR 98-4069.

CDM, 2003. *Long Island Source Water Assessment Program (SWAP) Task 3A.1 Report Nassau County Model*.

CDM, 1993. *Preliminary Report on Saltwater Intrusion Modeling For the Water Authority of Great Neck North.*

CDM, 1990. Nassau *County Regional Groundwater Model Development and Calibration (November, 1990).*

Chu, Anthony; Monti, Jack, Jr.; Bellitto, A. J., Jr. 1997. *Public-Supply Pumpage in Kings, Queens, and Nassau Counties, New York, 1880-1995. OFR 97-567.*

van der Heijde, Paul K.M., 1999. DYNFLOW Version 5.18: Testing and Evaluation of Code.

International Ground Water Modeling Center, 1985. *Review of DYNFLOW and DYNTRACK Groundwater Simulation Computer Codes.* Report of Findings by Paul K.M. van der Heijde for U.S. Environmental Protection Agency. IGWMC 85-17.

Misut, Paul E.; Monti, Jack, Jr. 1999. *Simulation of Ground-Water Flow and Pumpage in Kings and Queens Counties, Long Island, New York.* WRIR 98-4071.

Smolensky, D.A, H.T. Buxton, and P.K. Shernoff, 1989, *Hydrologic Framework of Long Island, New York,* U.S. Geological Survey Hydrologic Investigations Atlas HA-709

Stumm, F. 2001. *Hydrogeology and Extent of Saltwater Intrusion of the Great Neck Peninsula.* WRIR 99-4280.

Stumm, F., Lange, A., Candela, J. 2002. *Hydrogeology and Extent of Saltwater Intrusion on Manhasset Neck.* WRIR 00-4193.

Table 2-1
Summary of Pumping for No Action Scenario

Well	*Owner*	*Water Use*	*Simulated Pumping Rate (gpm)*
N7445	Water Authority of Western Nassau County	Public Supply Well	482
N4388	Water Authority of Great Neck North	Public Supply Well	372
N12796	Water Authority of Great Neck North	Public Supply Well	368
N12999	Water Authority of Great Neck North	Public Supply Well	1000
N13000	Water Authority of Great Neck North	Public Supply Well	1000
N13821	Water Authority of Great Neck North	Public Supply Well	1000
N5099	Manhasset Lakeville Water District	Public Supply Well	600
N13704	Manhasset Lakeville Water District	Public Supply Well	1380
N7512	Garden City Park Water District	Public Supply Well	830
N13221	North Shore Towers	Irrigation	31
N13889	North Shore Towers	Irrigation	94
N5535	Deepdale Country Club	Irrigation	30
N9687	Fresh Meadow Country Club	Irrigation	31
N8038	Lake Success Park Golf Course	Irrigation	40
N7053	North Hills Golf Club	Irrigation	41

Table 2-2
Simulated Scenarios for OU2 Feasibility Study

FS Scenario	*OU-1 Pumping (gpm)*	*OU-2 IRM Pumping (gpm)*	*Proposed New Remediation Wells and Pumping*					
			Simulation ID	*Pumping Location*	*FS Well ID (For reference with main FS report text)*	*New Remediation Well Pumping (gpm)*	*Discharge ID*	*Discharge Location*
Scenario 1	730	-	-	-	-	-	-	-
Scenario 2A	730	500	-	-	-	-	-	-
Scenario 2B	850	500	EW-1D	onsite	EW-1D	-	OU-1	OU-1
Scenario 2C	850	500	EW-1D	onsite	EW-1D	-	OU-1	OU-1
Scenario 3A	850	500	RW300	Village of Lake Success Golf Course	RW300	500	DW103, DW104	OU-2 IRM Diffusion Wells
Scenario 3B	850	500	RW300	Village of Lake Success Golf Course	RW300	500	DW300, DW301	Village of Lake Success Golf Course
Scenario 4A	850	500	RW400	Manhasset-Lakeville Water District N-12802 Parcel	RW400BM RW400MM	1,200	DW400, DW401, DW402	Fresh Meadow Golf Course Parking Lot
Scenario 4B	850	500	RW401	North Shore Hospital LIJ	RW401BM RW401MM	1,000	DW404, DW405, DW406	North Shore Hospital - South
Scenario 4C	850	500	RW300	Village of Lake Success Golf Course	RW300	1,600	DW407, DW408	Manhasset-Lakeville Water District N-12802 Parcel
			RW402	Manhasset-Lakeville Water District South Parcel	RW402		DW404, DW405	North Shore Hospital - South
Scenario 4D	850	500	RW400	Manhasset-Lakeville Water District N-12802 Parcel	RW400BM RW400MM	3,000	DW404, DW405	North Shore Hospital - South
			RW403	Village of Lake Success Ball Fields	RW403		DW409 - DW414	North Shore Hospital - North
			RW404	Korean Church	RW404			
Scenario 4E	850	500	RW300	Village of Lake Success Golf Course	RW300	1,600	DW300, DW301	Village of Lake Success Golf Course
			RW401	North Shore Hospital LIJ	RW401BM RW401MM		DW404, DW405	North Shore Hospital - South
Scenario 4F	850	500	RW404	Korean Church	RW404	1,600	DW404, DW405	North Shore Hospital - South
							DW409, DW410	North Shore Hospital - North
Scenario 4G	850	500	RW5099	MLWD N-5099 parcel	RW-5099	1,200	DW413, DW414	North Shore Hospital - South
							DW411, DW412	Macy's Parking Lot
Scenario 4H	850	500	RW5099	MLWD N-5099 parcel	RW5099	1,700	DW413, DW414	North Shore Hospital - South
			RW300	Village of Lake Success Golf Course	RW300		DW411, DW412	Macy's Parking Lot
							DW300, DW301	Village of Lake Success Golf Course
Scenario 5A	850	500	RW300	Village of Lake Success Golf Course	RW300	3,200	DW403, DW415, DW416, DW417	Fresh Meadow Golf Course Parking Lot
			RW400	Manhasset-Lakeville Water District N-12802 Parcel	RW400BM RW400MM			
			RW403	Village of Lake Success Ball Fields	RW403		DW404, DW405, DW406	North Shore Hospital - South
Scenario 5B	850	500	RW501 -504	Neighborhood Parcels North of Long Island Expressway	RW501 -504	3,300	DW501 -509	Neighborhood Parcels North of Long Island Expressway

Note:
For Scenarios 2B, 3, 4 and 5, increased OU-1 pumping is not included in "New Remediation Well Pumping".
In Scenario 2G, N-5099 is pumped at 1,200 gpm with the assumption that the water will be treated and distributed.
In Scenario 4H and 4L, N-5099 is used as a remediation well with the assumption that water will be treated and reinjected to groundwater.
The proposed remediation wells pump from middle and/or basal Magothy aquifer.
Remediation pumping and diffusion were simulated from a single location in the model. In reality some scenarios require multiple extraction or diffusion locations depending on the volume of flow.

Table 3-1
Remediation Implementation Assumptions For OU-2 Feasibility Study Scenario Simulations

Scenario	*New Remediation Well Pumping (gpm)*	*Delay Associated with Design and Implementation (years)**	*OU-2 Remediation Pumping Operation Period (years)*
Scenario 1	0	0	30 **
Scenario 2A	0	0	30
Scenario 2B	120	1	29
Scenario 2C***	120	1	29
Scenario 3A	500	3	27
Scenario 3B	500	3	27
Scenario 4A	1,200	5	25
Scenario 4B	1,200	5	25
Scenario 4C	1,600	5	25
Scenario 4D	3,000	5	25
Scenario 4E	1,600	5	25
Scenario 4F	1,600	5	25
Scenario 4G	1,200	5	25
Scenario 4H	1,700	5	25
Scenario 5A	3,200	5	25
Scenario 5B	3,300	5	25

* OU-1 and OU-2 IRM operate during delay period

** OU-1 pumping simulated for period of 30 years

Table 3-2
Summary of Mass Transport Model Properties

Hydrogeologic Unit	*Dispersivity (ft)*		*Effective*	*Retardation*
	Longitudinal	*Transverse*	*Porosity*	*Coefficient*
Lloyd Aquifer	30.00	3.00	0.20	1.00
Raritan Clay	30.00	3.00	0.20	1.00
North Shore Aquifer	30.00	3.00	0.20	1.00
North Shore Confining Unit	30.00	3.00	0.20	1.00
Magothy Aquifer	30.00	3.00	0.20	1.00
Jameco Aquifer	30.00	3.00	0.20	1.00
Gardiners 20-Foot Clay	30.00	3.00	0.20	1.00
Upper Glacial Aquifer	30.00	3.00	0.20	1.00
Outwash	30.00	3.00	0.20	1.00
Moraine	30.00	3.00	0.20	1.00

Note: Transverse dispersion in the vertical direction is reduced by an anisotropy ratio of 1:10.

Table 3-3
Simulated TVOC Concentrations at Receptor Wells for No Action Scenario

Well	*Owner*	*Water Use*	*Range of Simulated TVOC Concentrations (ppb)*		
N7445	Water Authority of Western Nassau County	Public Supply Well	0	to	0
N4388	Water Authority of Great Neck North	Public Supply Well	0	to	15
N12796	Water Authority of Great Neck North	Public Supply Well	0	to	9
N12999	Water Authority of Great Neck North	Public Supply Well	9	to	81
N13000	Water Authority of Great Neck North	Public Supply Well			
N13821	Water Authority of Great Neck North	Public Supply Well			
N5099	Manhasset Lakeville Water District	Public Supply Well	1	to	158
N13704	Manhasset Lakeville Water District	Public Supply Well	0	to	0
N7512	Garden City Park Water District	Public Supply Well	0	to	0
N13221	North Shore Towers	Irrigation	0	to	48
N13889	North Shore Towers	Irrigation	0	to	84
N5535	Deepdale Country Club	Irrigation	0	to	0
N9687	Fresh Meadow Country Club	Irrigation	0	to	0
N8038	Lake Success Park Golf Course	Irrigation	0	to	103
N7053	North Hills Golf Club	Irrigation	0	to	0

Table 3-4
Simulated Mass Removal Over 30 Years for OU-2 Feasibility Study Scenarios

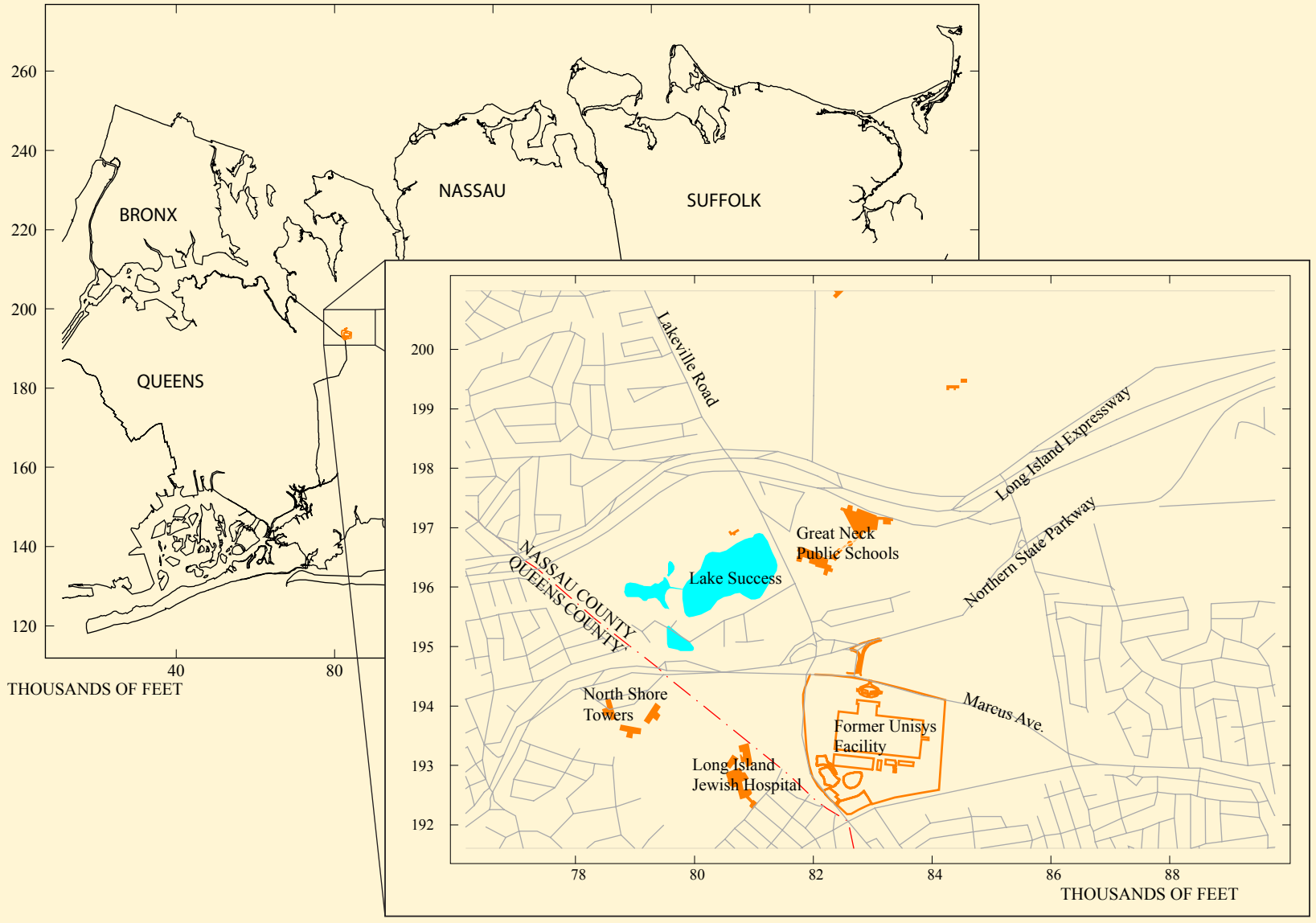
FS Scenario	*New Off-Site Remediation Well Pumping (gpm)**	*Simulated Delay Associated with Design and Implementation (years)*	*OU2 Remediation Pumping Operation Period (years)***	*Simulated Total Mass Removed by Well Group During 30-year Simulation Period, lb*					
				OU1	*OU2 IRM*	*Water Supply Wells*	*Golf Course Wells*	*Proposed Remediation Wells*	*Total Removal*
Scenario 1	0	0	30	5,600	0	23,300	300	0	29,200
Scenario 2A	0	0	30	5,400	4,800	18,900	200	0	29,300
Scenario 2B	0	1	30	8,700	3,000	17,700	200	0	29,600
Scenario 2C	0	1	30	8,700	2,900	19,000	200	0	30,800
Scenario 3A	500	3	27	8,500	2,500	10,600	200	8,800	30,600
Scenario 3B	500	3	27	8,600	2,800	12,400	200	6,900	30,900
Scenario 4A	1,200	5	25	8,700	3,000	4,600	200	13,600	30,100
Scenario 4B	1,000	5	25	8,700	3,000	5,100	200	13,300	30,300
Scenario 4C	1,600	5	25	8,500	2,700	3,800	200	15,700	30,900
Scenario 4D	3,000	5	25	8,500	2,600	1,500	200	18,800	31,600
Scenario 4E	1,600	5	25	8,600	2,800	3,700	200	15,900	31,200
Scenario 4F	1,600	5	25	8,500	2,600	3,200	200	16,600	31,100
Scenario 4G	1,200	5	25	8,900	3,100	2,500	200	14,300	29,000
Scenario 4H	1,700	5	25	8,700	2,900	2,200	200	16,800	30,800
Scenario 5A	3,200	5	25	8,600	2,700	1,400	200	19,200	32,100
Scenario 5B	3,300	5	25	8,500	2,700	1,300	200	19,700	32,400

* Does not include increased OU-1 pumping

** OU1 and OU2 IRM operate during delay period

Table 3-5
Summary of Simulated TVOC Plume Impacts to Receptor Wells
Number of Years During 30 Year Simulation Period That Receptor Wells Are Impacted By Concentrations Greater Than 5 ppb

FS Scenario Category	*New Off-Site Remediation Well Pumping (gpm) (Does not include new OU-1 pumping)*	*Number of impacted years*												
		Public Supply Wells							*Golf Course Wells*					
		N-7445 WAWNC	*N-12796 WAGNN*	*N-4388 WAGNN*	*N-12999 N-13000 N-13821 Average*	*N-5099 MLWD*	*N-7512 GCP*	*N13704 MWLD*	*N-13221 North Shore Towers*	*N13889 North Shore Towers*	*N-5535 Deepdale*	*N-9687 Fresh Meadows*	*N-8038 Lake Success*	*N-7053 North Hills*
Scenario 1	0	Not Impacted	4	13	30	25	Not Impacted	Not Impacted	4	16	Not Impacted	Not Impacted	14	Not Impacted
Scenario 2A	0	Not Impacted	4	12	30	25	Not Impacted	Not Impacted	5	17	Not Impacted	Not Impacted	12	Not Impacted
Scenario 2B	0	Not Impacted	4	12	30	25	Not Impacted	Not Impacted	5	18	Not Impacted	Not Impacted	11	Not Impacted
Scenario 2C	0	Not Impacted	1	7	30	26	Not Impacted	Not Impacted	5	19	Not Impacted	Not Impacted	12	Not Impacted
Scenario 3A	500	Not Impacted	3	11	28	25	Not Impacted	Not Impacted	4	19	Not Impacted	Not Impacted	12	Not Impacted
Scenario 3B	500	Not Impacted	8	13	30	25	Not Impacted	Not Impacted	4	17	Not Impacted	Not Impacted	20	Not Impacted
Scenario 4A	1,200	Not Impacted	9	14	25	1	Not Impacted	Not Impacted	5	16	Not Impacted	Not Impacted	12	Not Impacted
Scenario 4B	1,000	Not Impacted	3	12	7	25	Not Impacted	Not Impacted	5	17	Not Impacted	Not Impacted	12	Not Impacted
Scenario 4C	1,600	Not Impacted	2	12	8	25	Not Impacted	Not Impacted	5	16	Not Impacted	3	11	Not Impacted
Scenario 4D	3,000	Not Impacted	Not Impacted	Not Impacted	7	5	Not Impacted	Not Impacted	5	15	Not Impacted	Not Impacted	11	Not Impacted
Scenario 4E	1,600	Not Impacted	8	13	7	25	Not Impacted	Not Impacted	5	17	Not Impacted	Not Impacted	19	Not Impacted
Scenario 4F	1,600	Not Impacted	1	11	8	25	Not Impacted	Not Impacted	5	16	Not Impacted	Not Impacted	12	Not Impacted
Scenario 4G	1,200	Not Impacted	6	13	12	25	Not Impacted	Not Impacted	5	18	Not Impacted	Not Impacted	12	Not Impacted
Scenario 4H	1,700	Not Impacted	9	14	10	25	Not Impacted	Not Impacted	4	17	Not Impacted	Not Impacted	19	Not Impacted
Scenario 5A	3,200	Not Impacted	Not Impacted	7	6	1	Not Impacted	Not Impacted	5	17	Not Impacted	1	10	Not Impacted
Scenario 5B	3,300	Not Impacted	Not Impacted	Not Impacted	7	Not Impacted	Not Impacted	Not Impacted	5	16	Not Impacted	Not Impacted	10	Not Impacted



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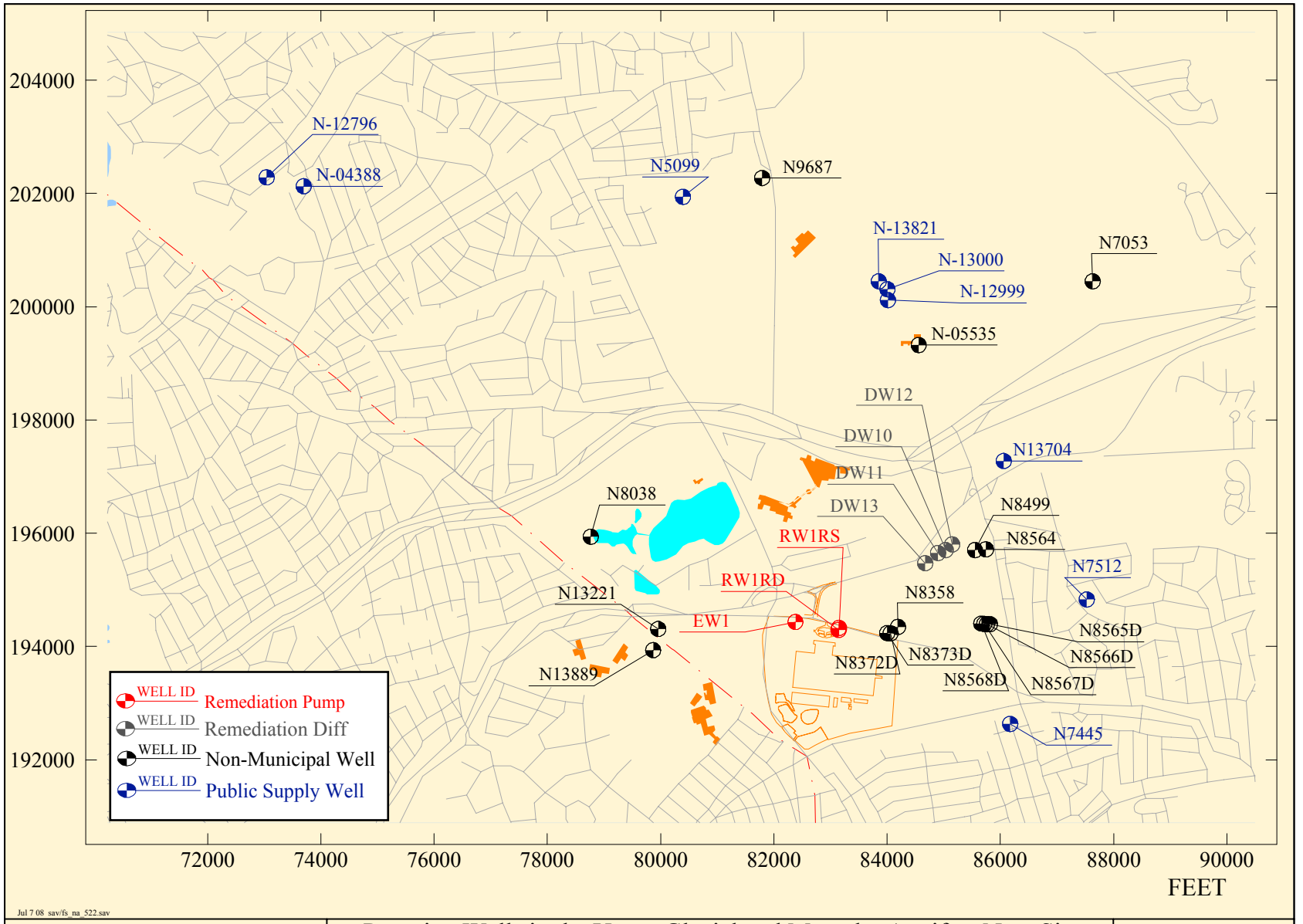
Site Location Map
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
1-1



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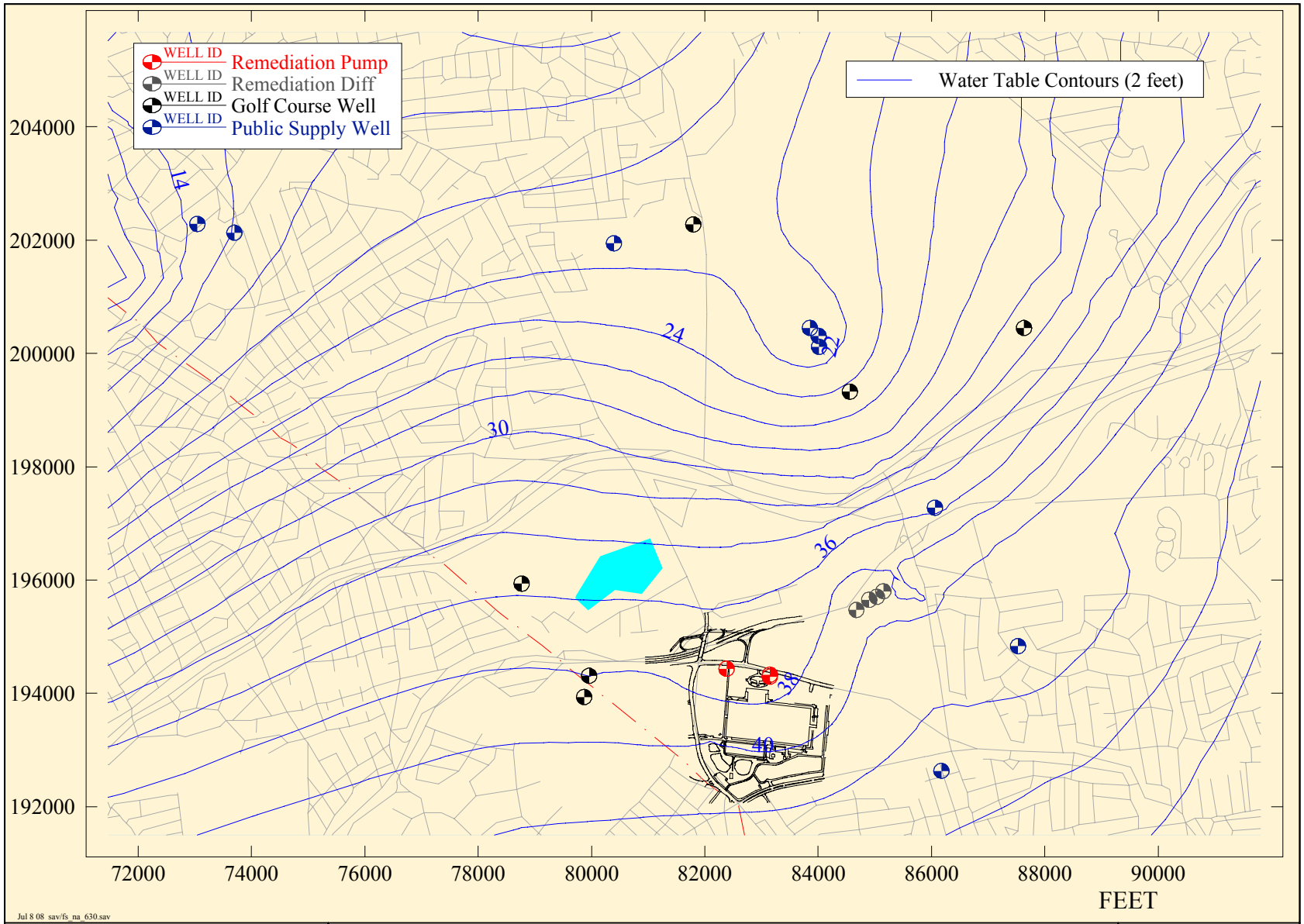
Pumping Wells in the Upper Glacial and Magothy Aquifers Near Site

Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
2-1



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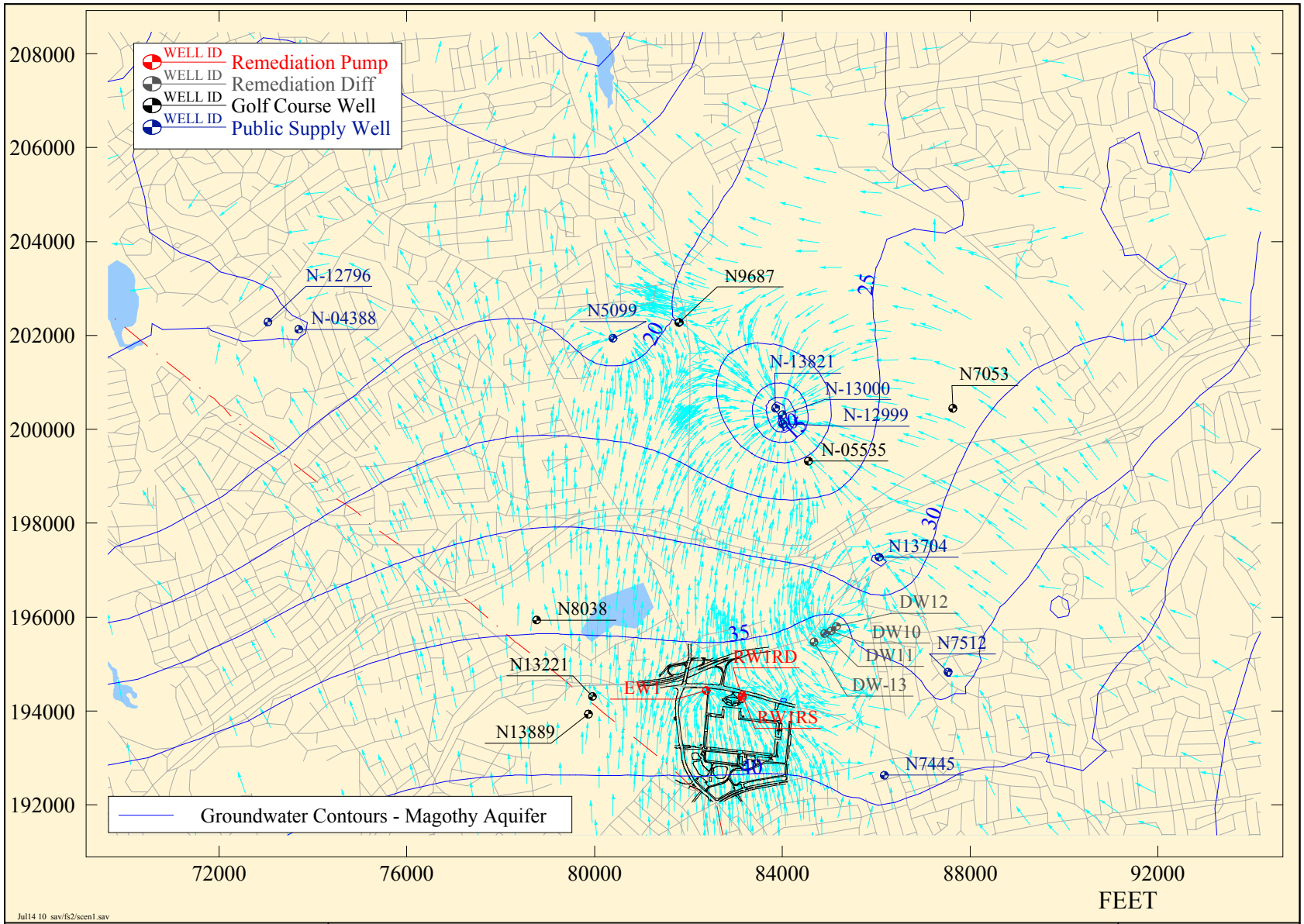
Water Table Contours
No Action Scenario
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
2-2



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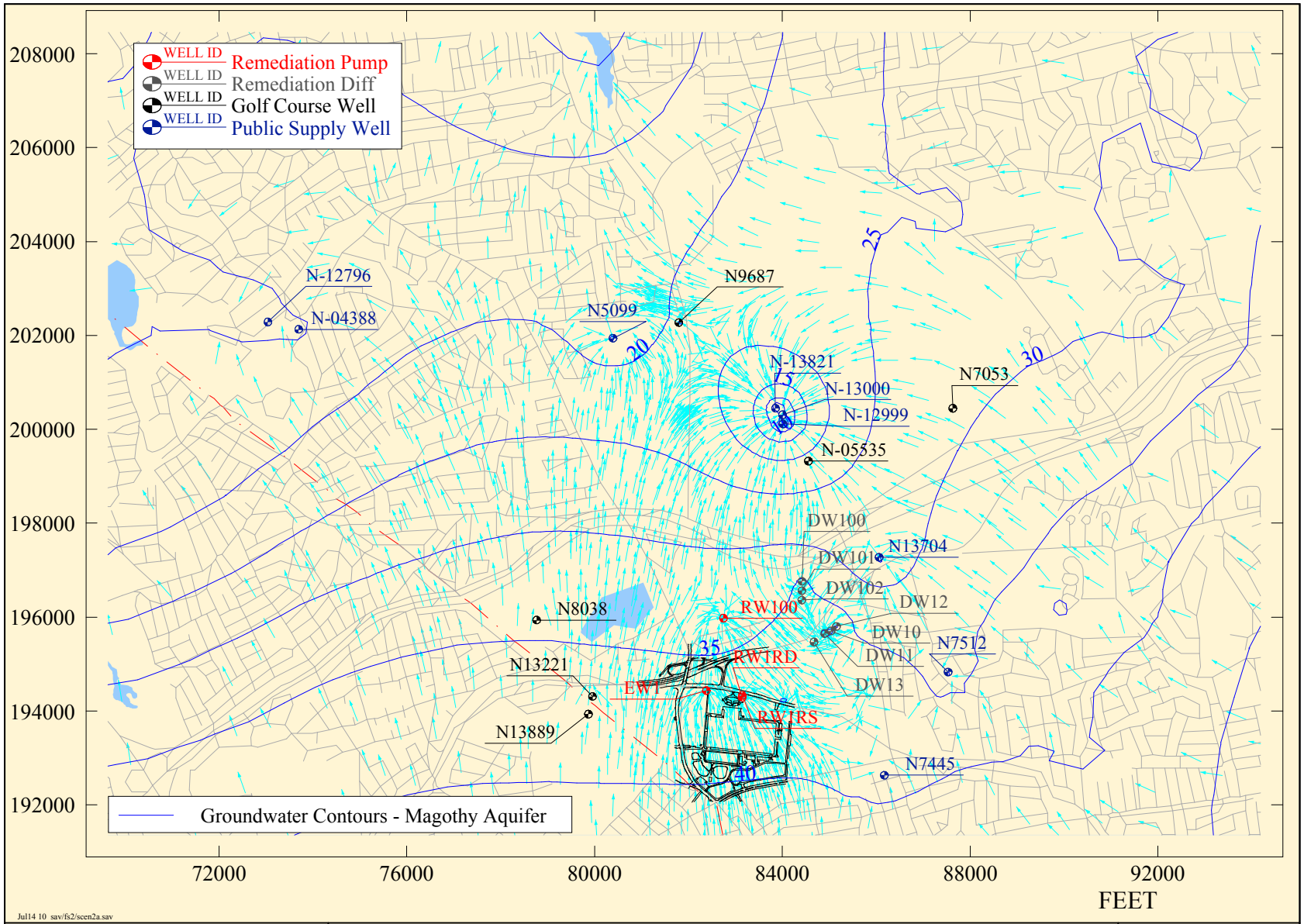
Groundwater Contours, Flow Directions and Well Locations
Scenario 1 (No Action)
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
2-3



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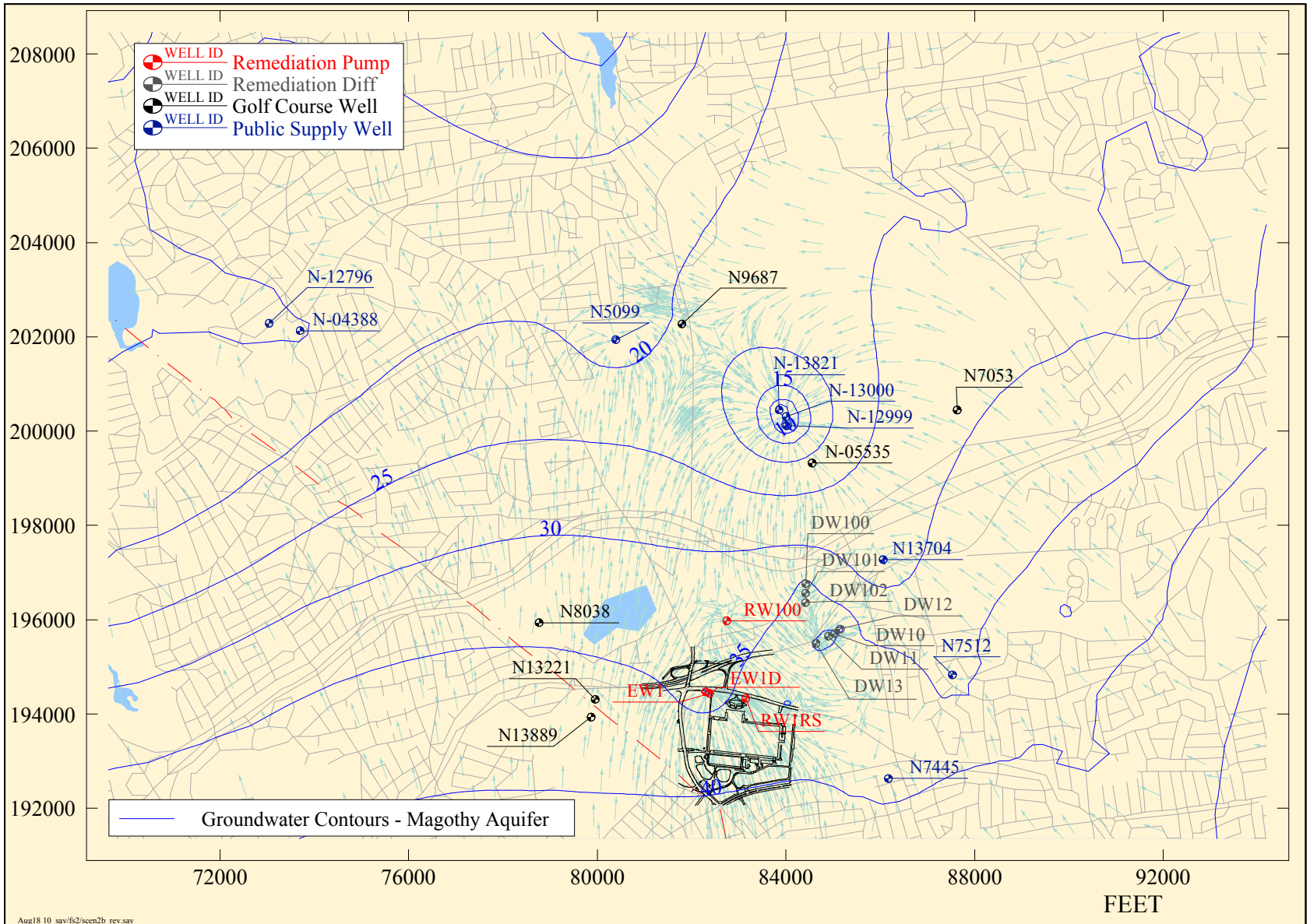
Groundwater Contours, Flow Directions and Well Locations
Scenario 2A
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
2-4



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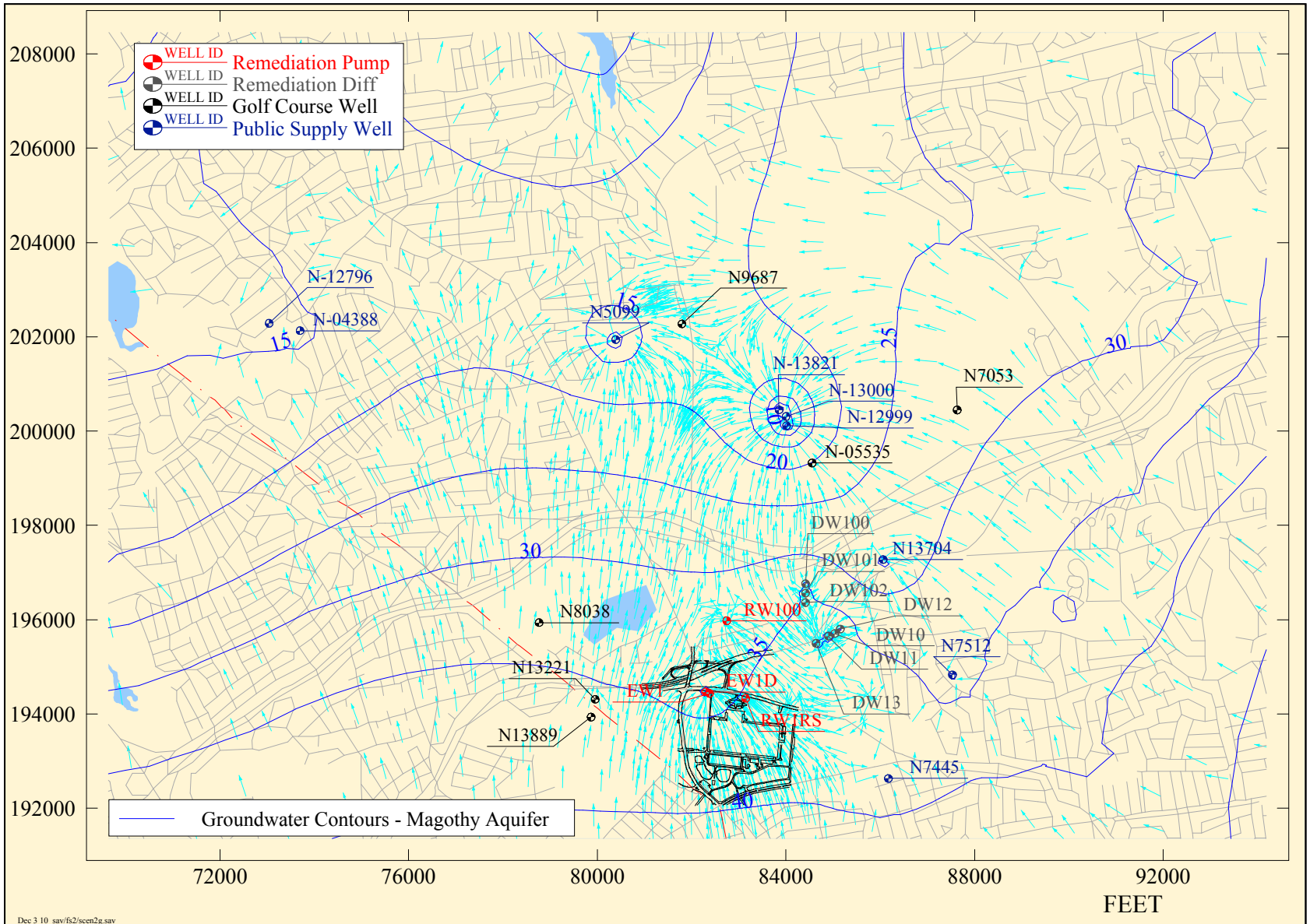
Groundwater Contours, Flow Directions and Well Locations
Scenario 2B
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

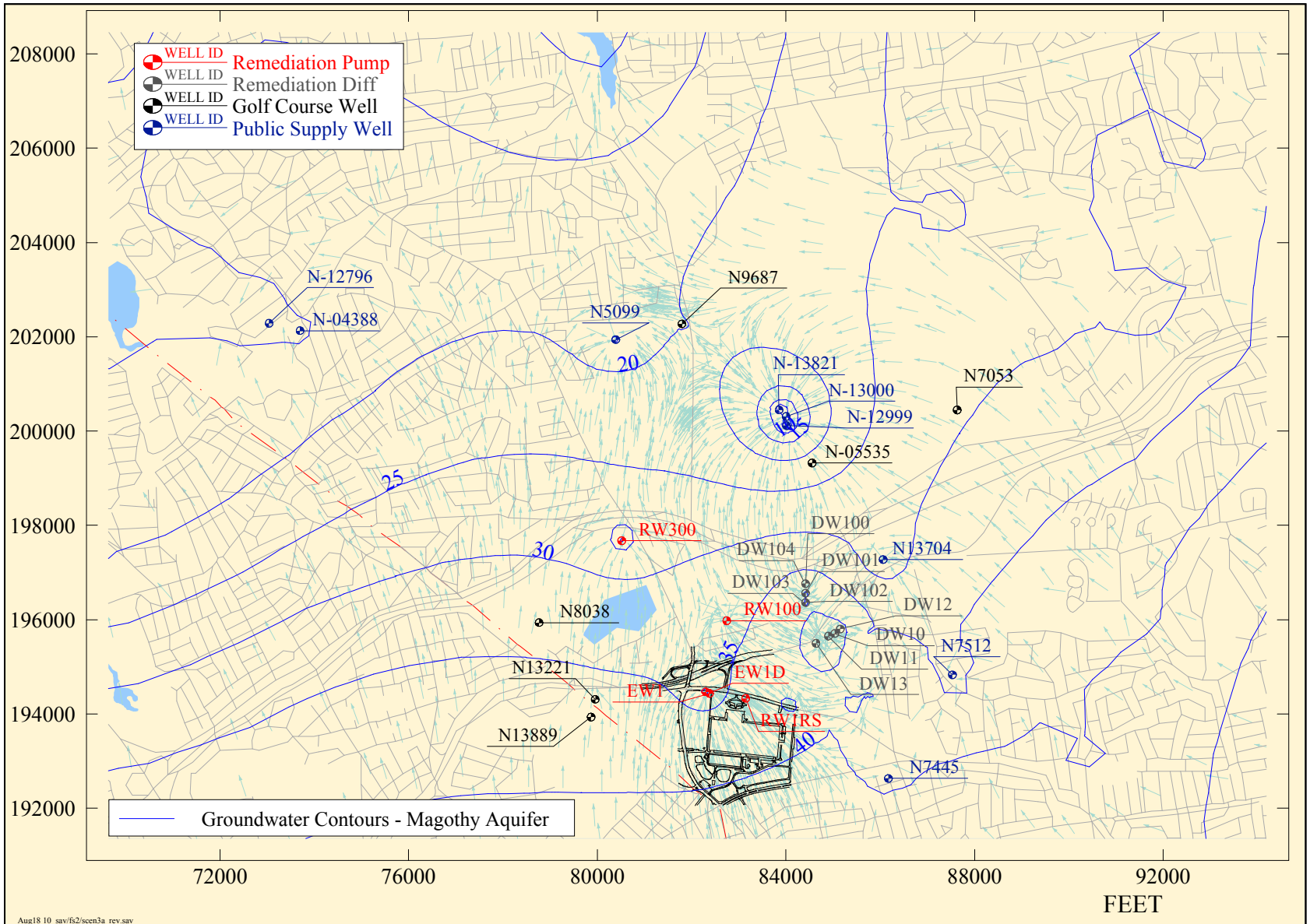
FIGURE
2-5



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 2C
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

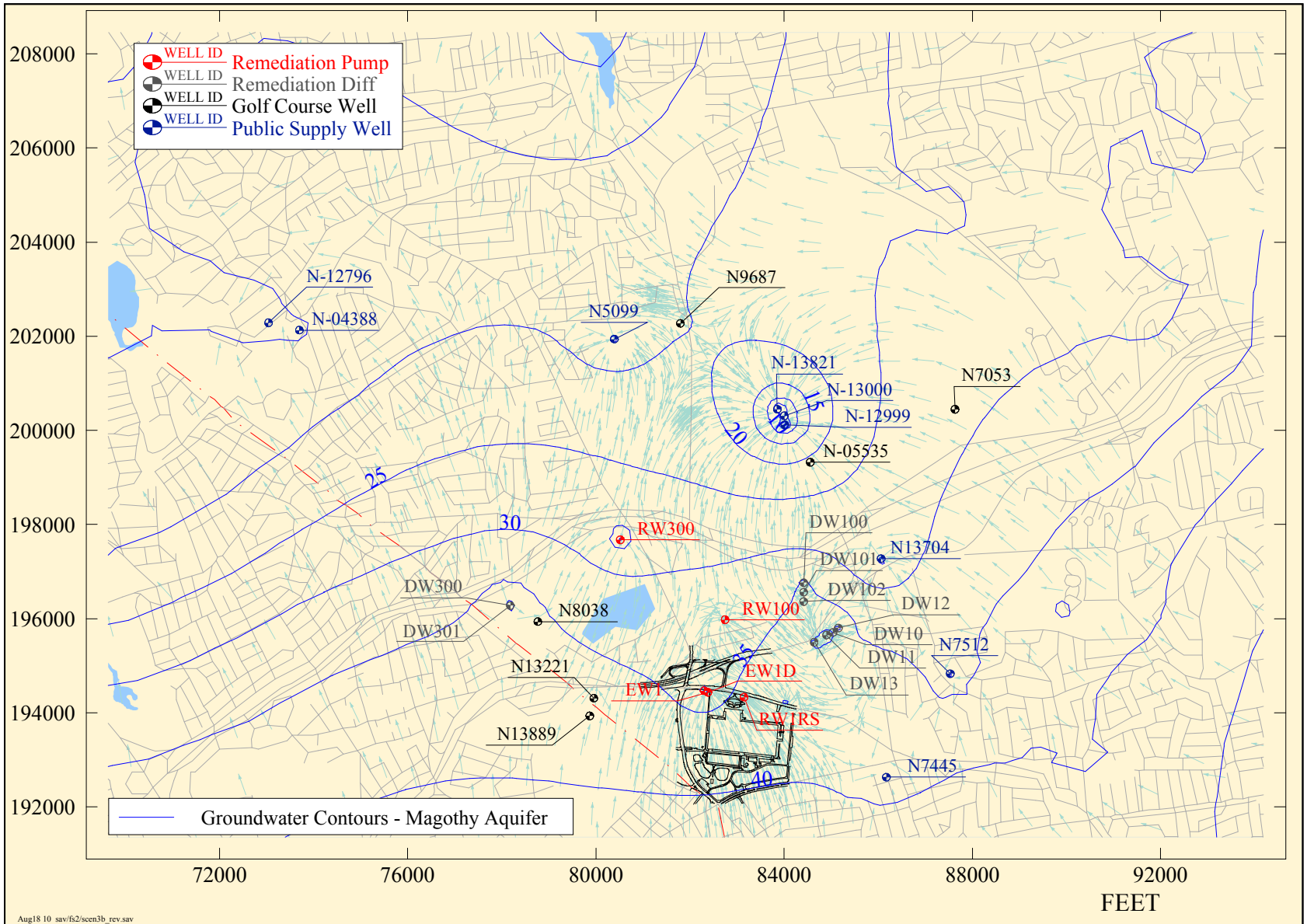
FIGURE
2-6



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 3A
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

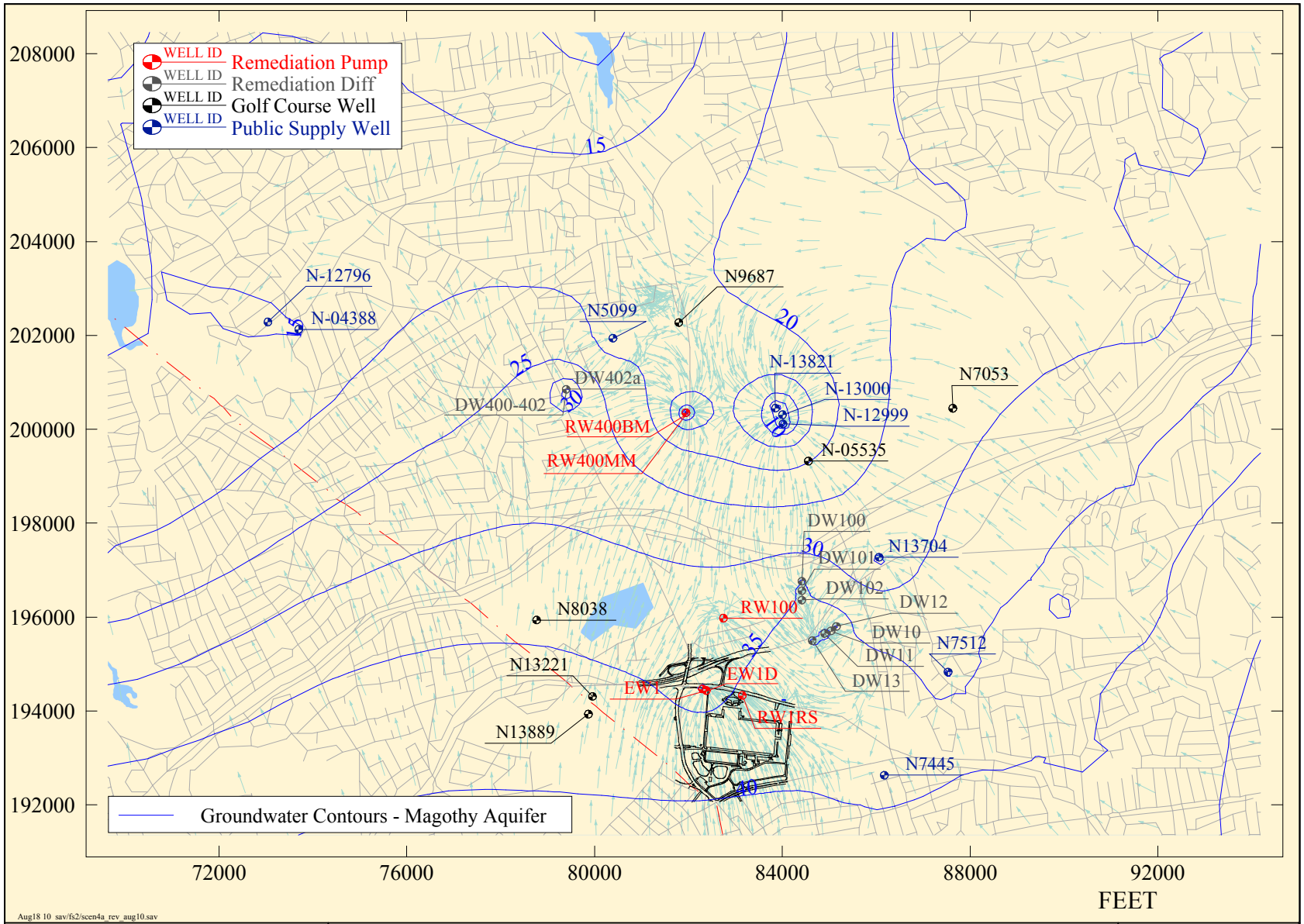
FIGURE
2-7



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 3B
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

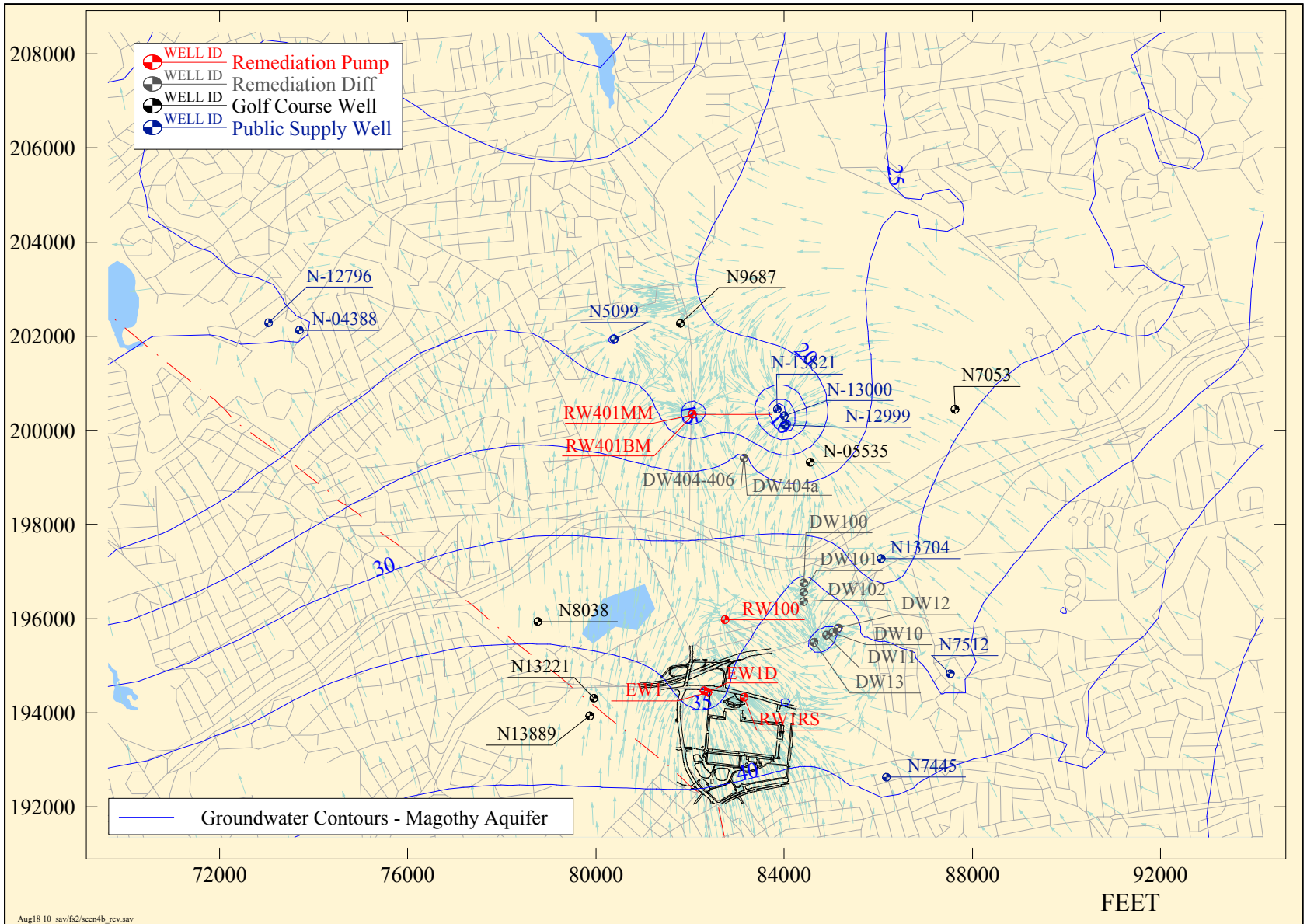
FIGURE
2-8



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 4A
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

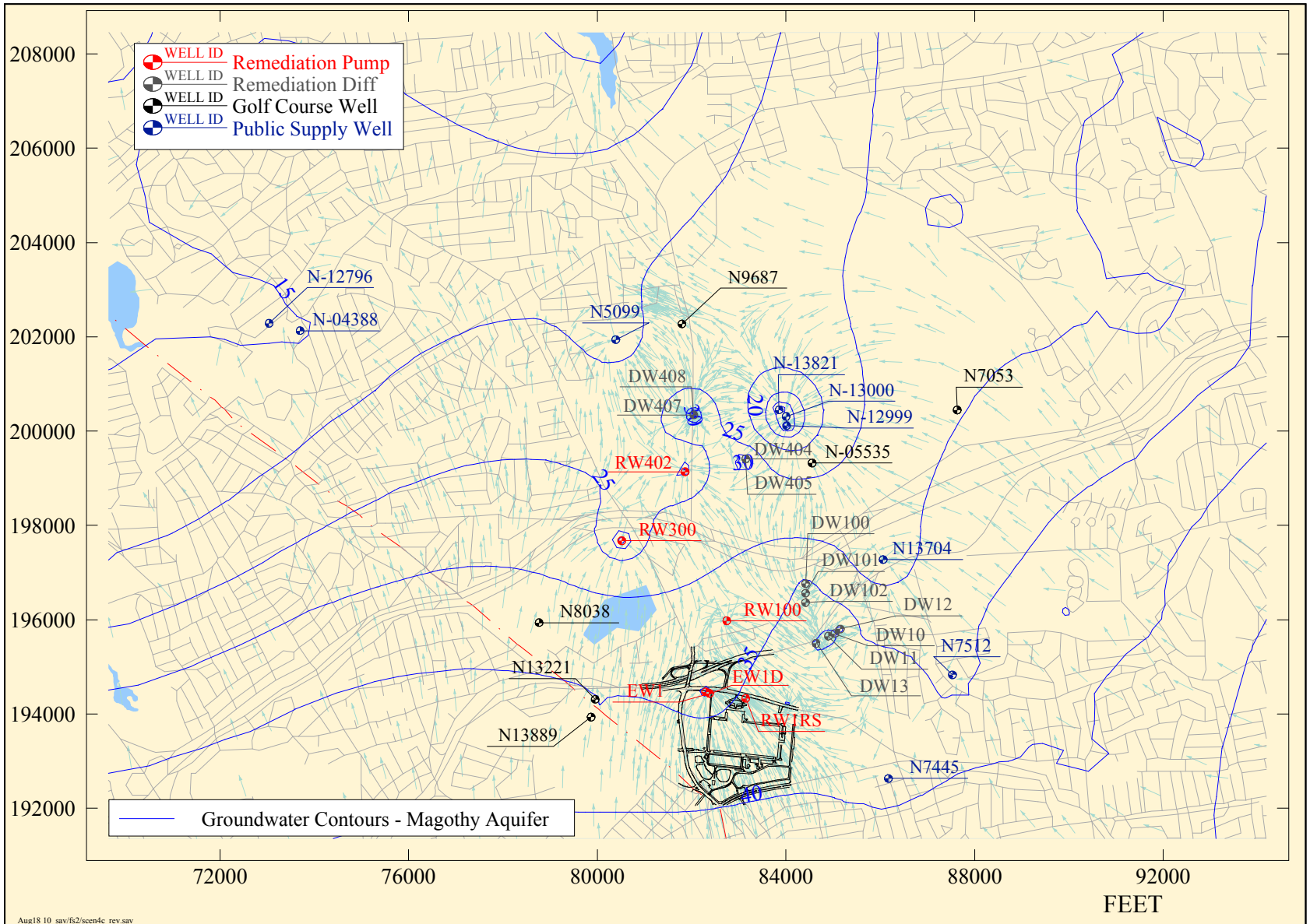
FIGURE
2-9



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 4B
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

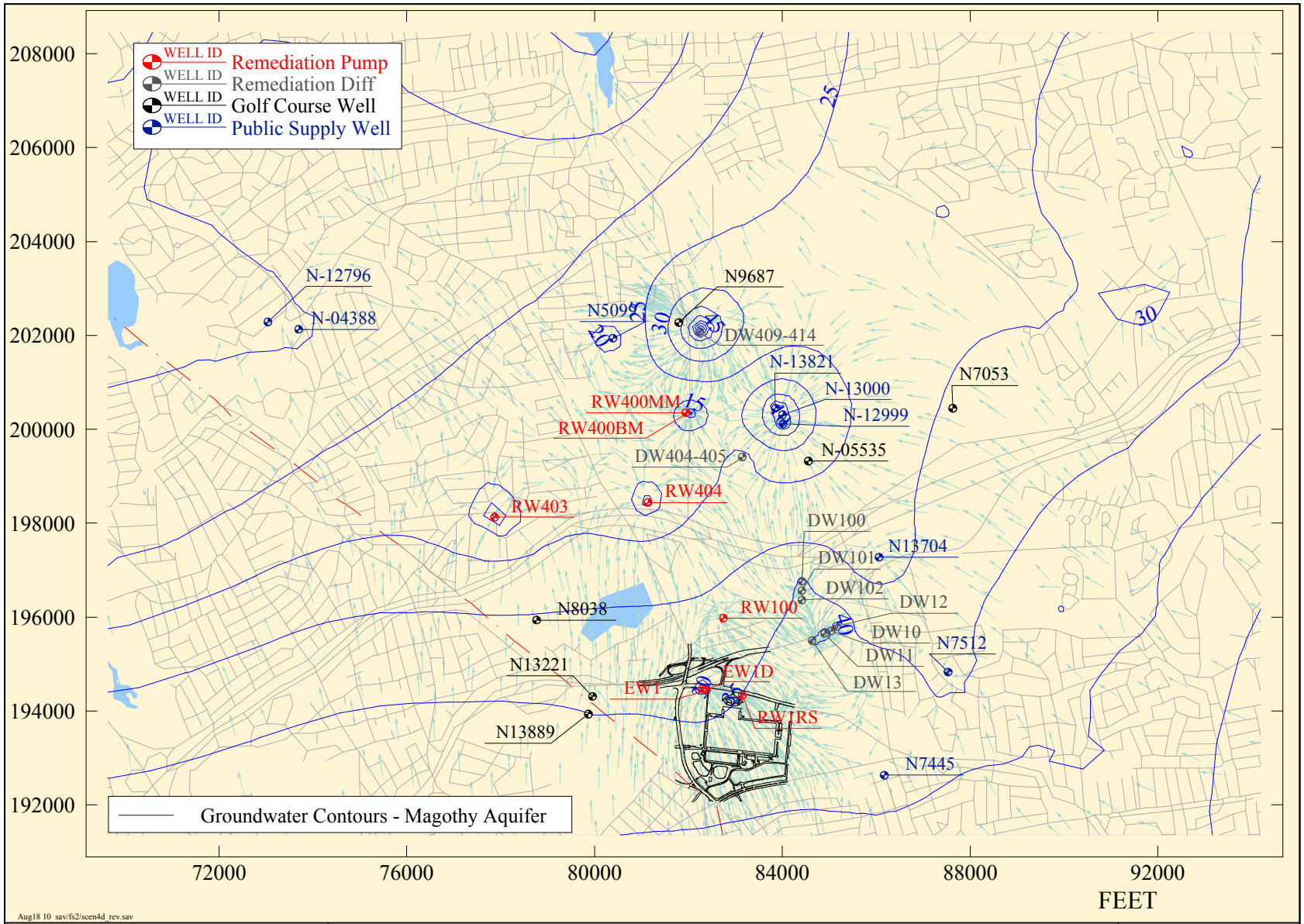
FIGURE
2-10



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 4C
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

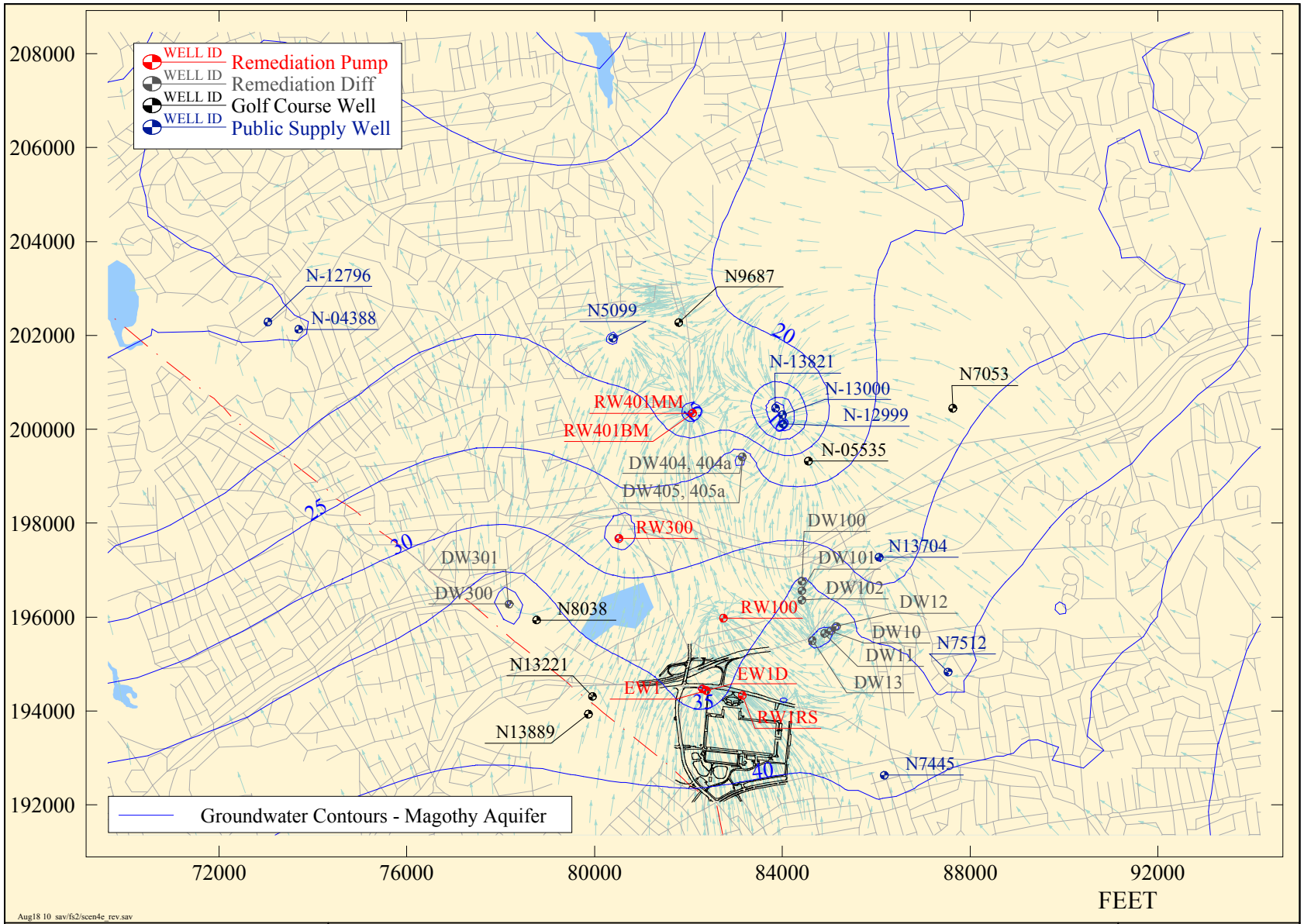
FIGURE
2-11



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 4D
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

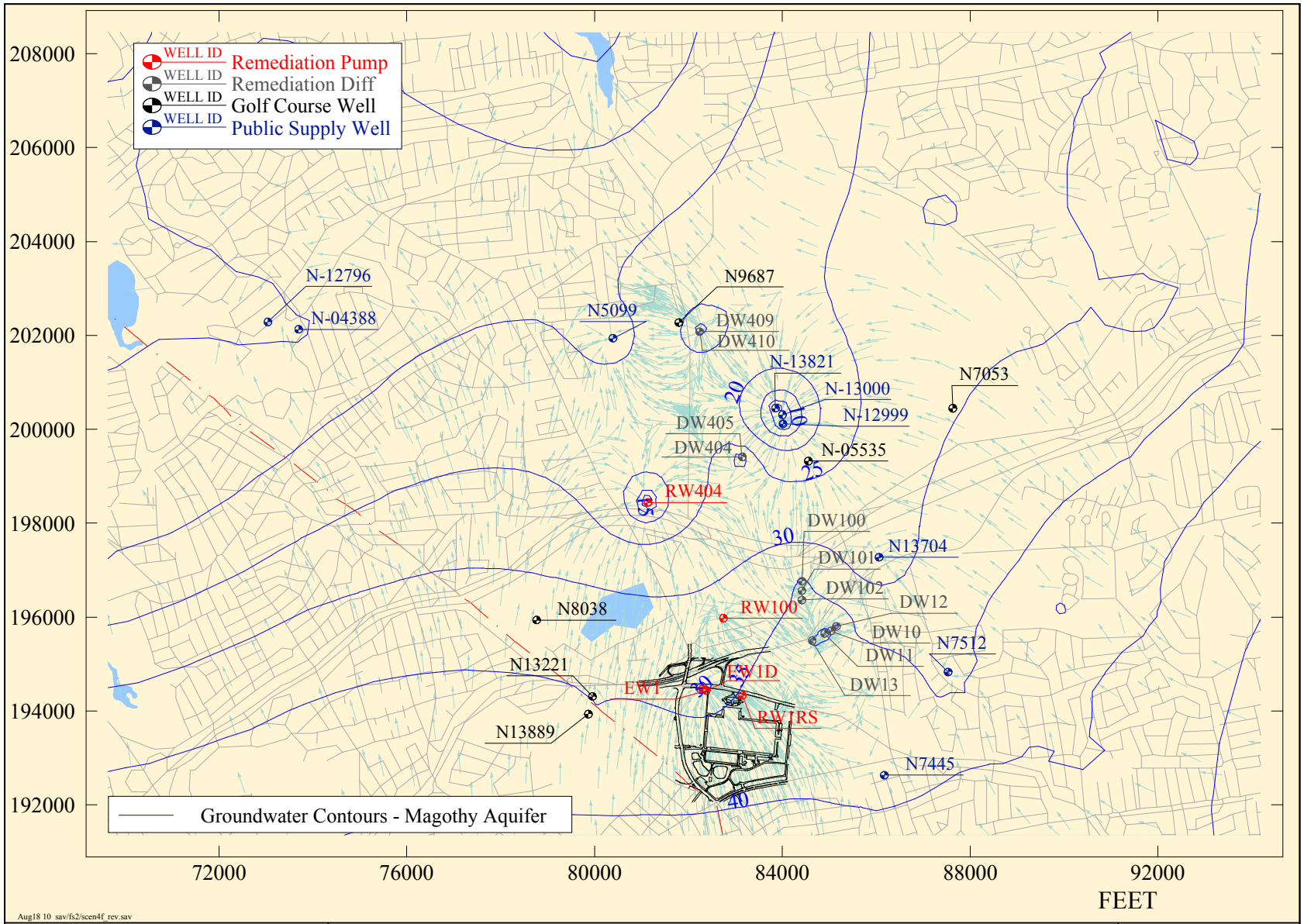
FIGURE
2-12



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 4E
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

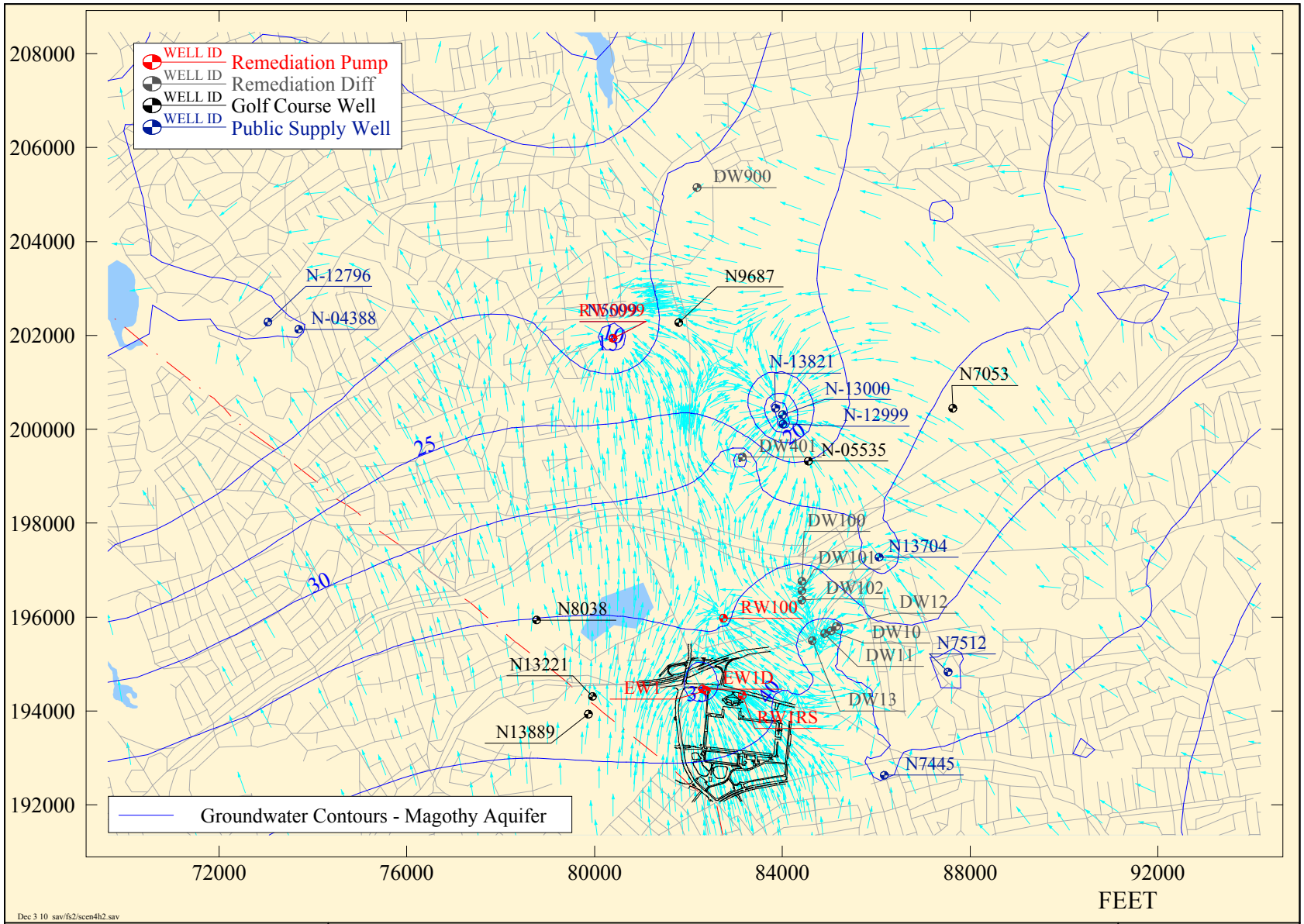
FIGURE
2-13



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 4F
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

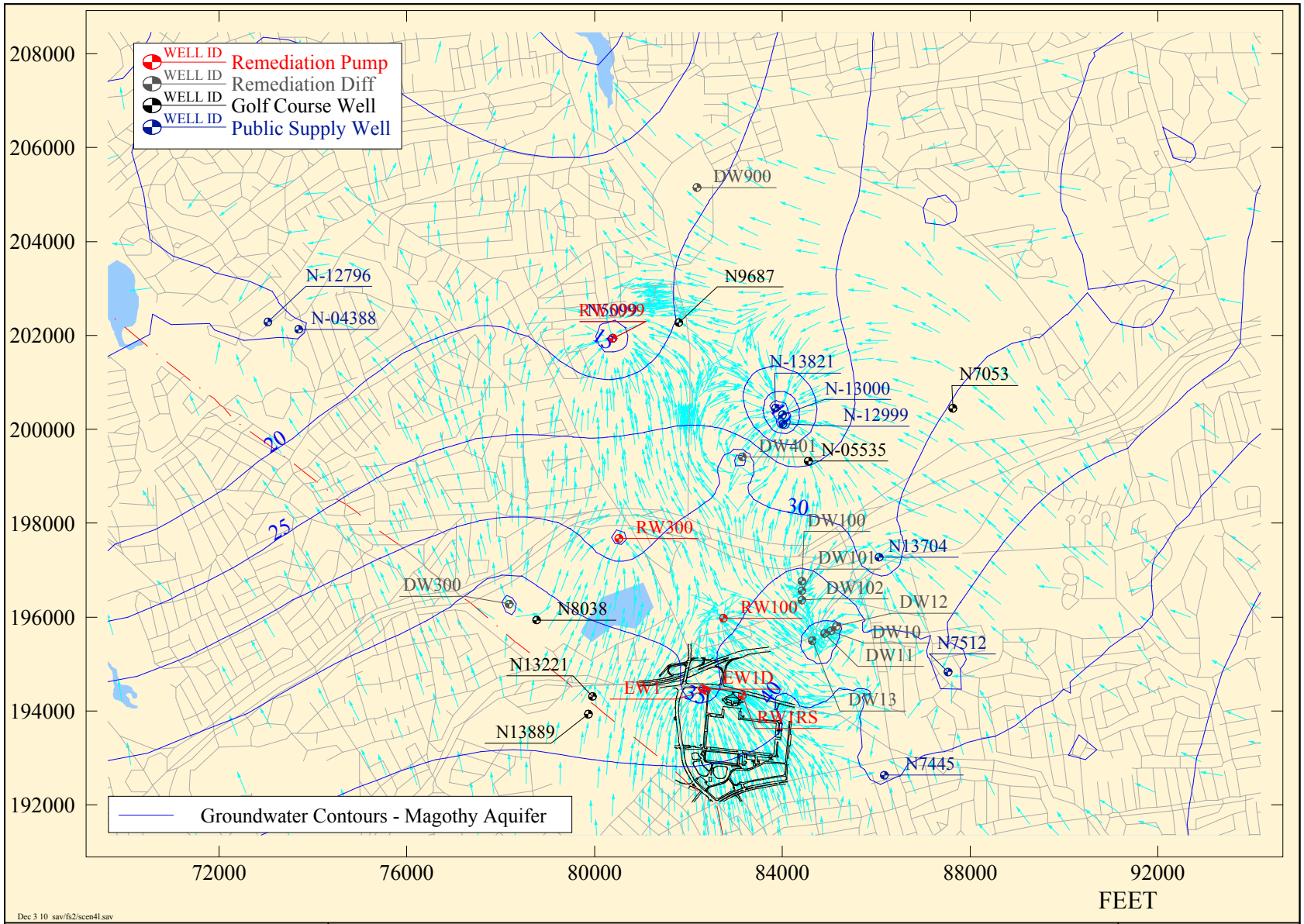
FIGURE
2-14



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 4G
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

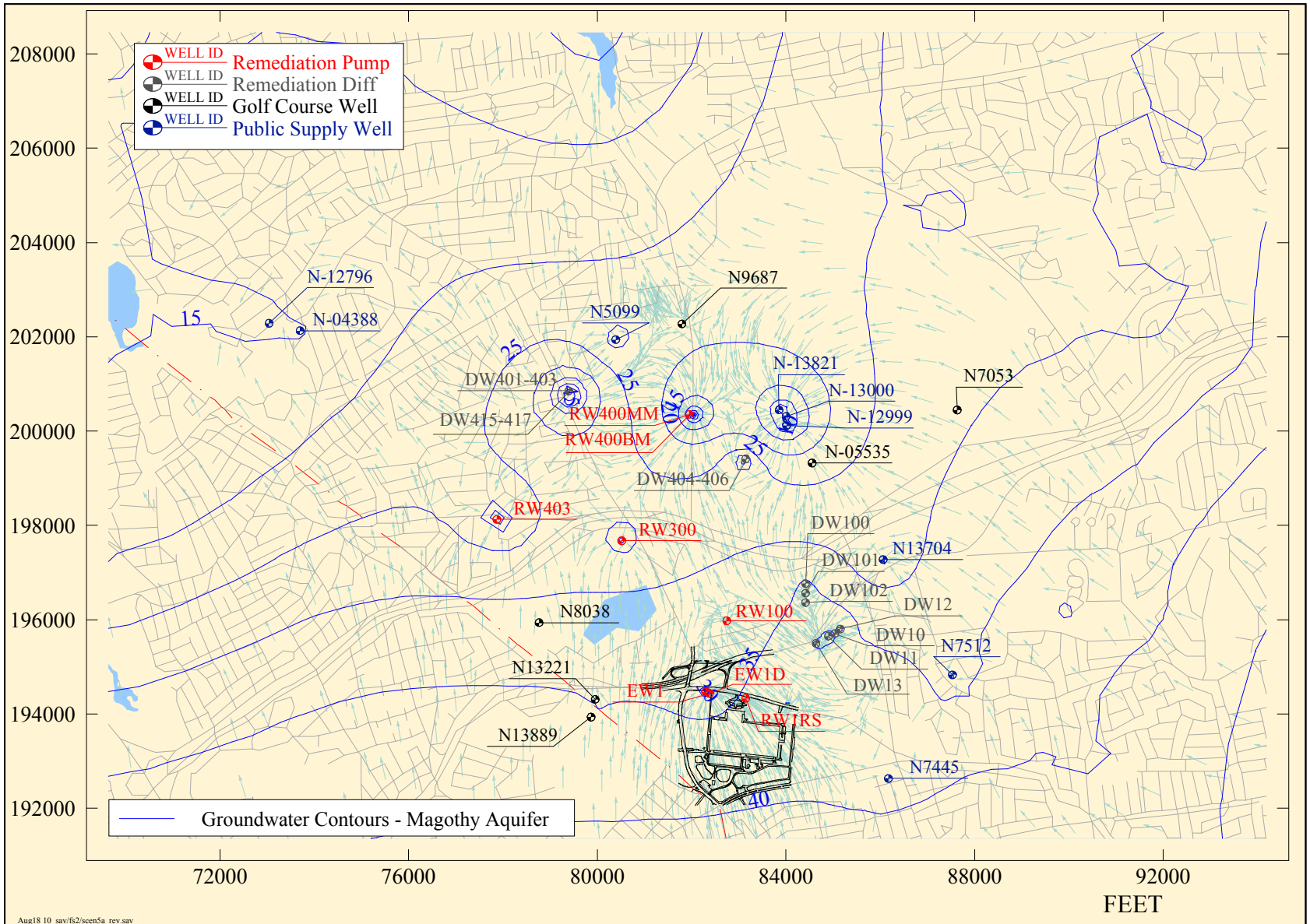
FIGURE
2-15



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 4H
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

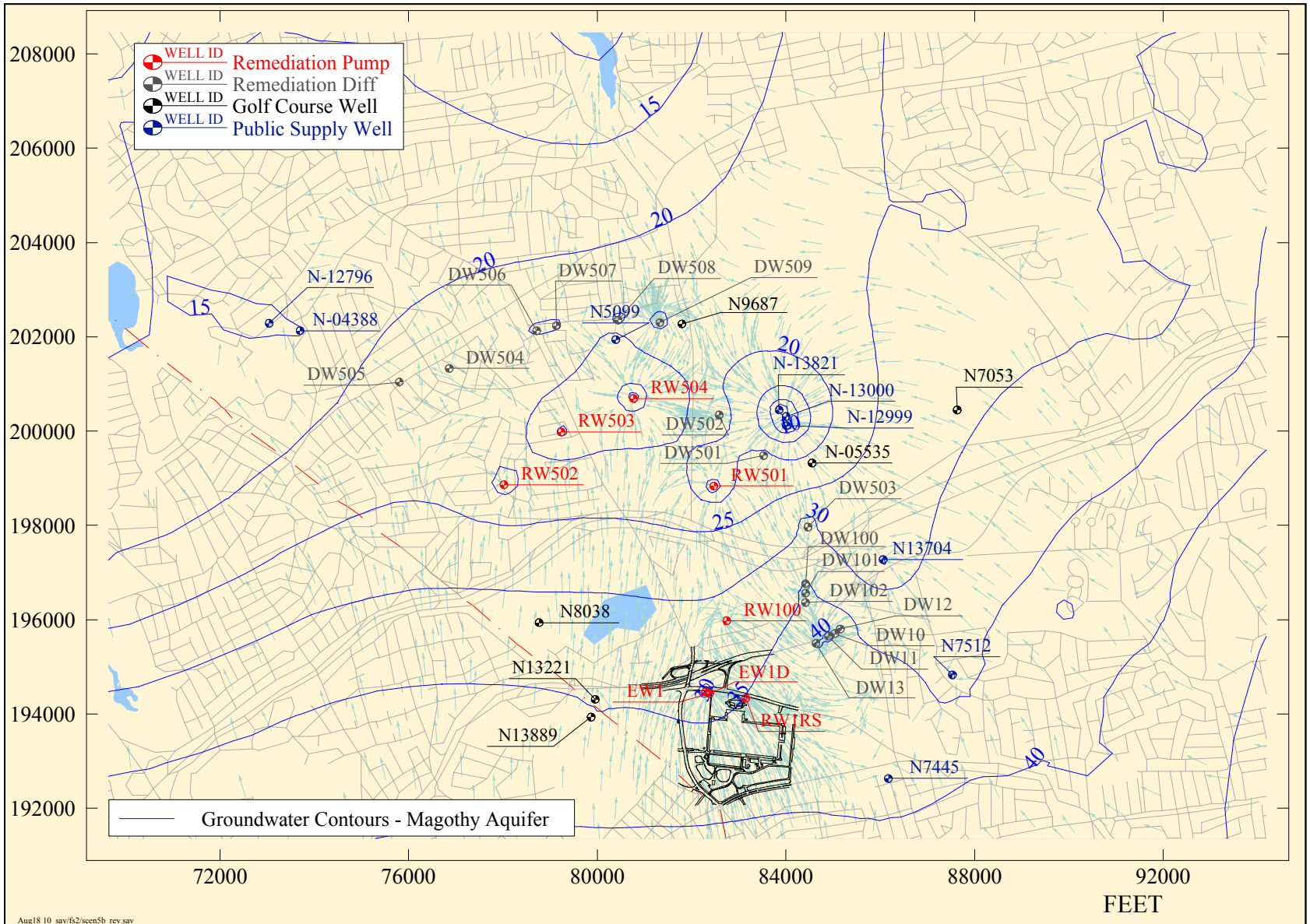
FIGURE
2-16



CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 5A
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
2-17

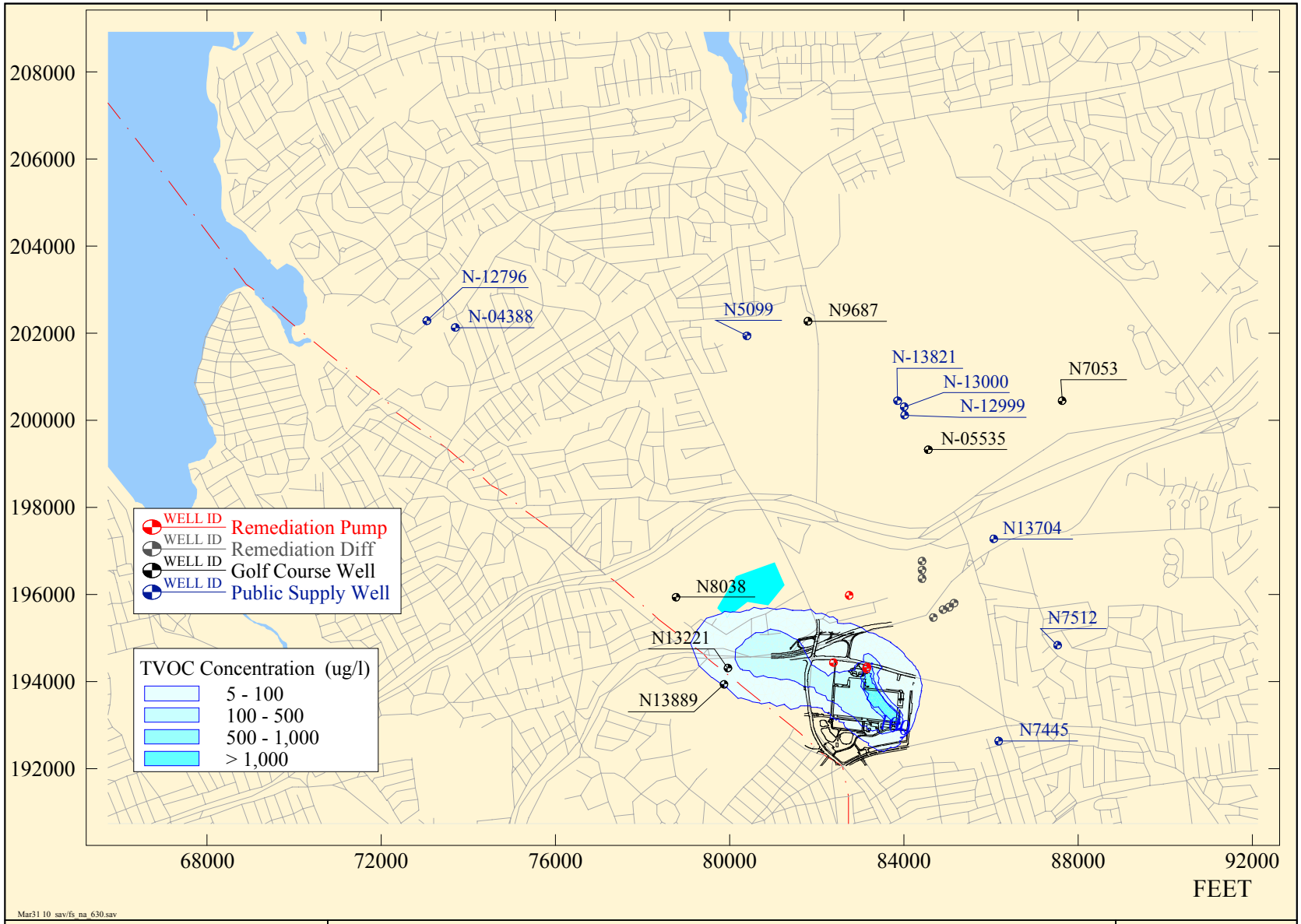


Aug18 10 sav/fs2/scen5b_rev.sav

CDM Smith

Groundwater Contours, Flow Directions and Well Locations
Scenario 5B
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

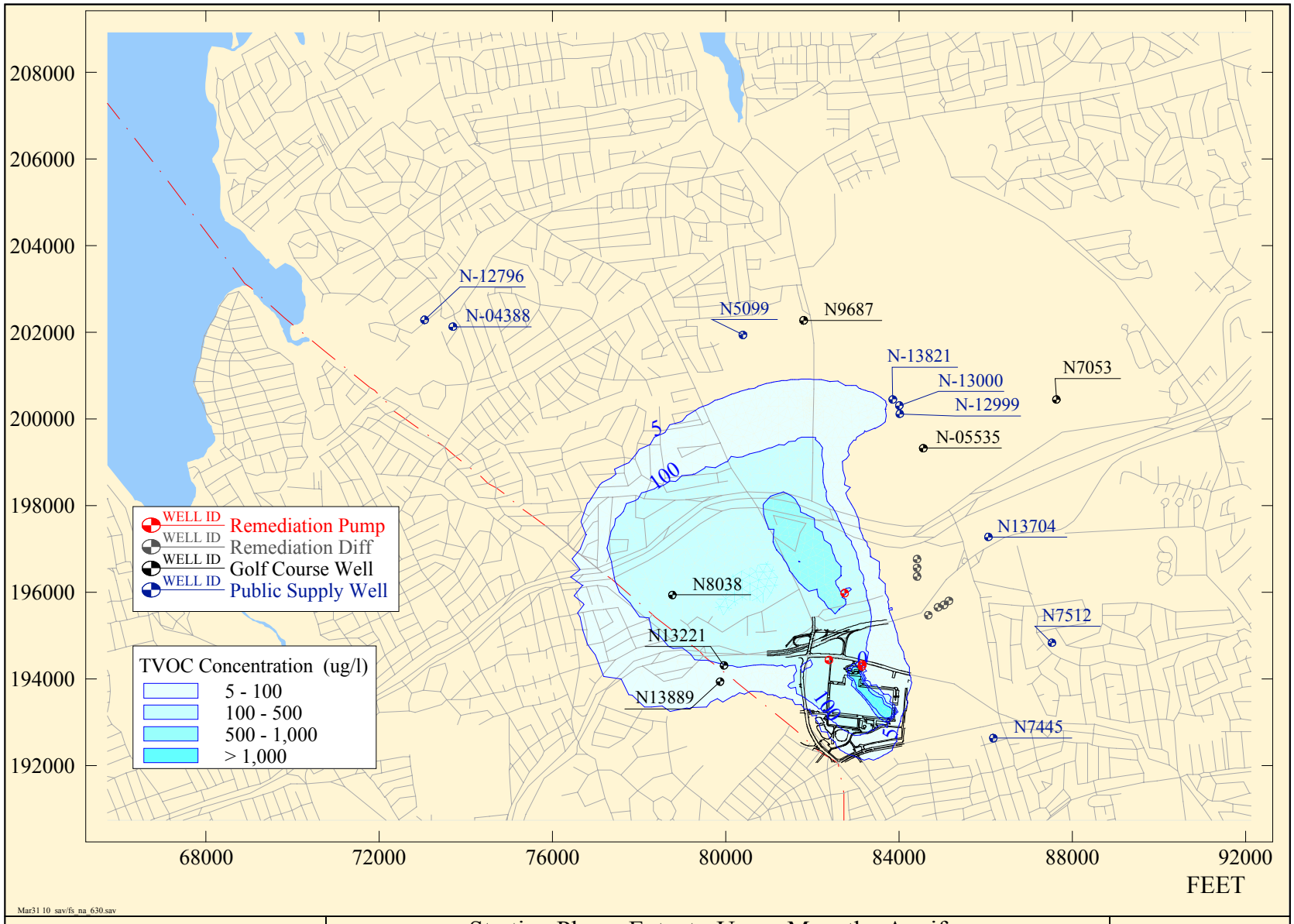
FIGURE
2-18



CDM Smith

Starting Plume Extent - Upper Glacial Aquifer
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

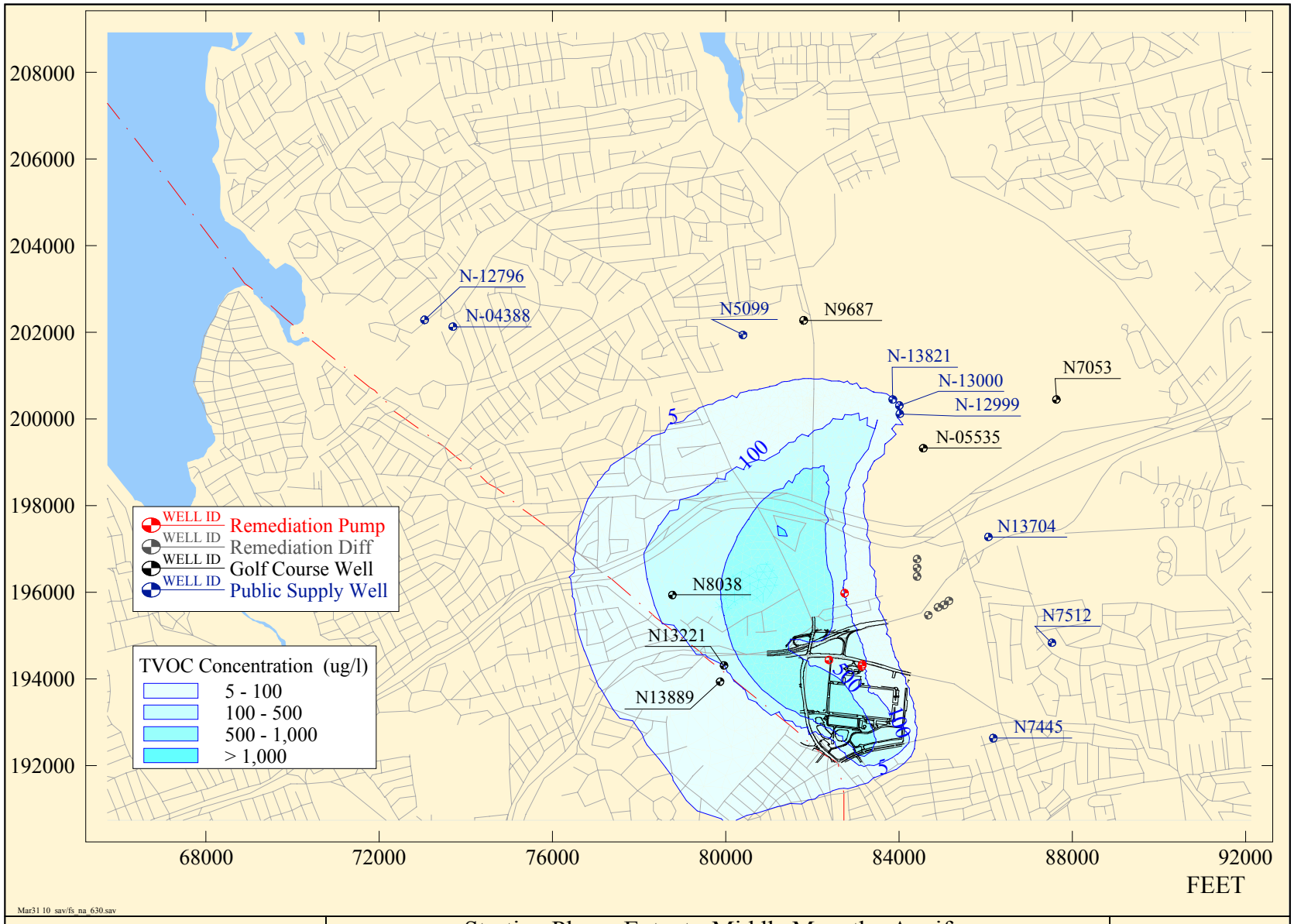
FIGURE
3-1



CDM Smith

Starting Plume Extent - Upper Magothy Aquifer
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

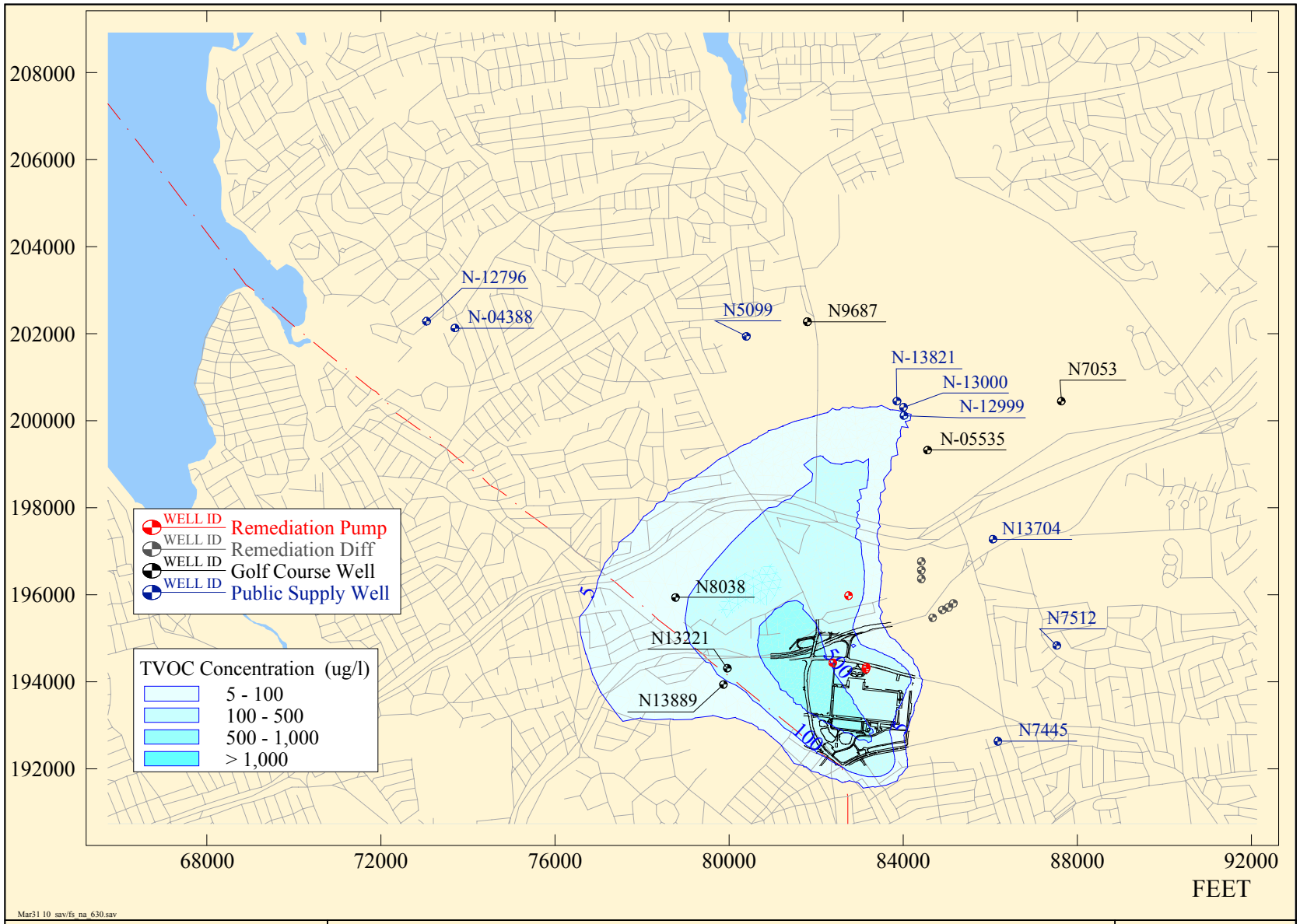
FIGURE
3-2



CDM Smith

Starting Plume Extent - Middle Magothy Aquifer
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

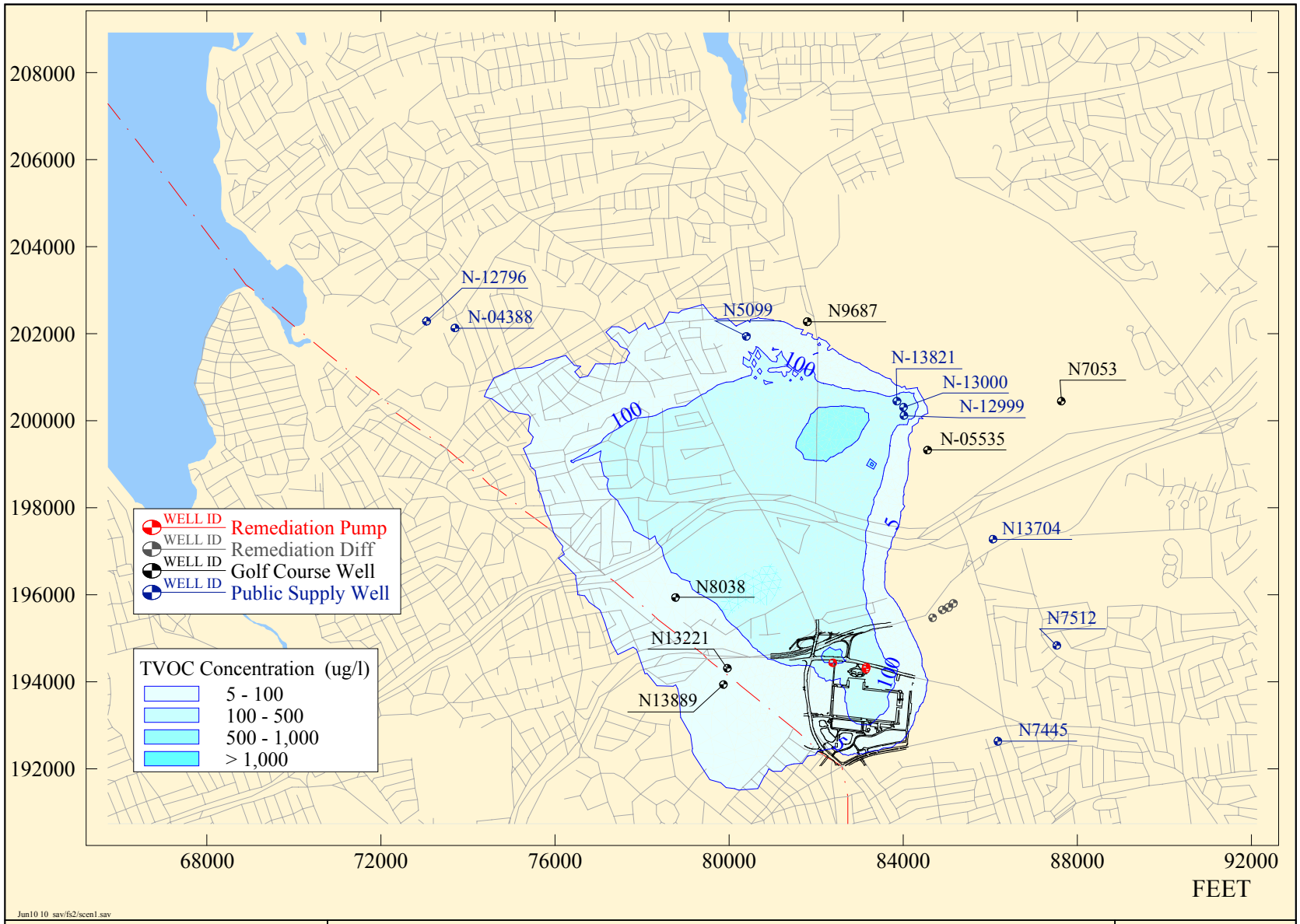
FIGURE
3-3



CDM Smith

Starting Plume Extent - Basal Magothy Aquifer
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

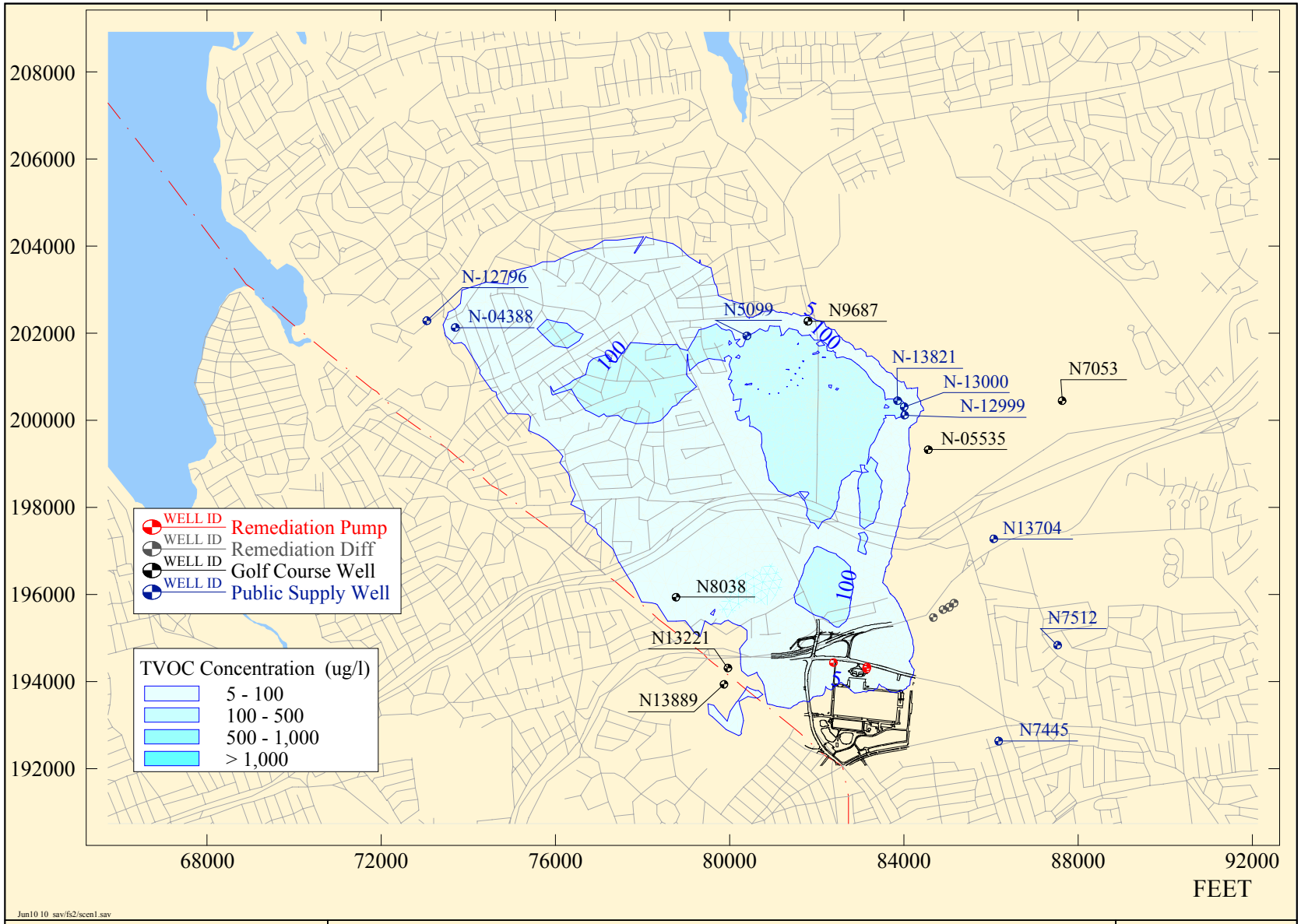
FIGURE
3-4



CDM Smith

Maximum Simulated TVOC Concentration for 10 Years
No Action Scenario
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

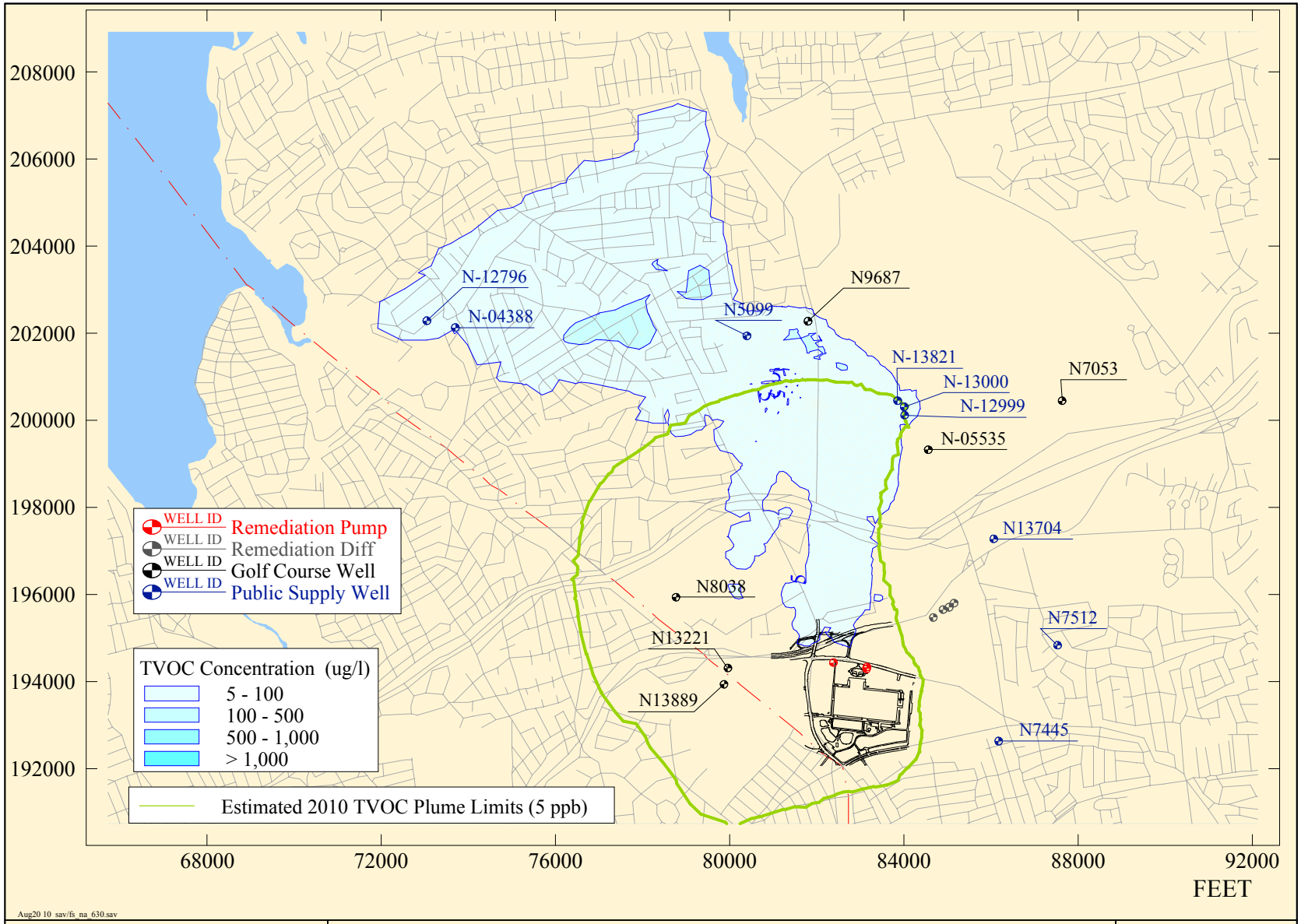
FIGURE
3-5



CDM Smith

Maximum Simulated TVOC Concentration for 20 Years
No Action Scenario
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
3-6

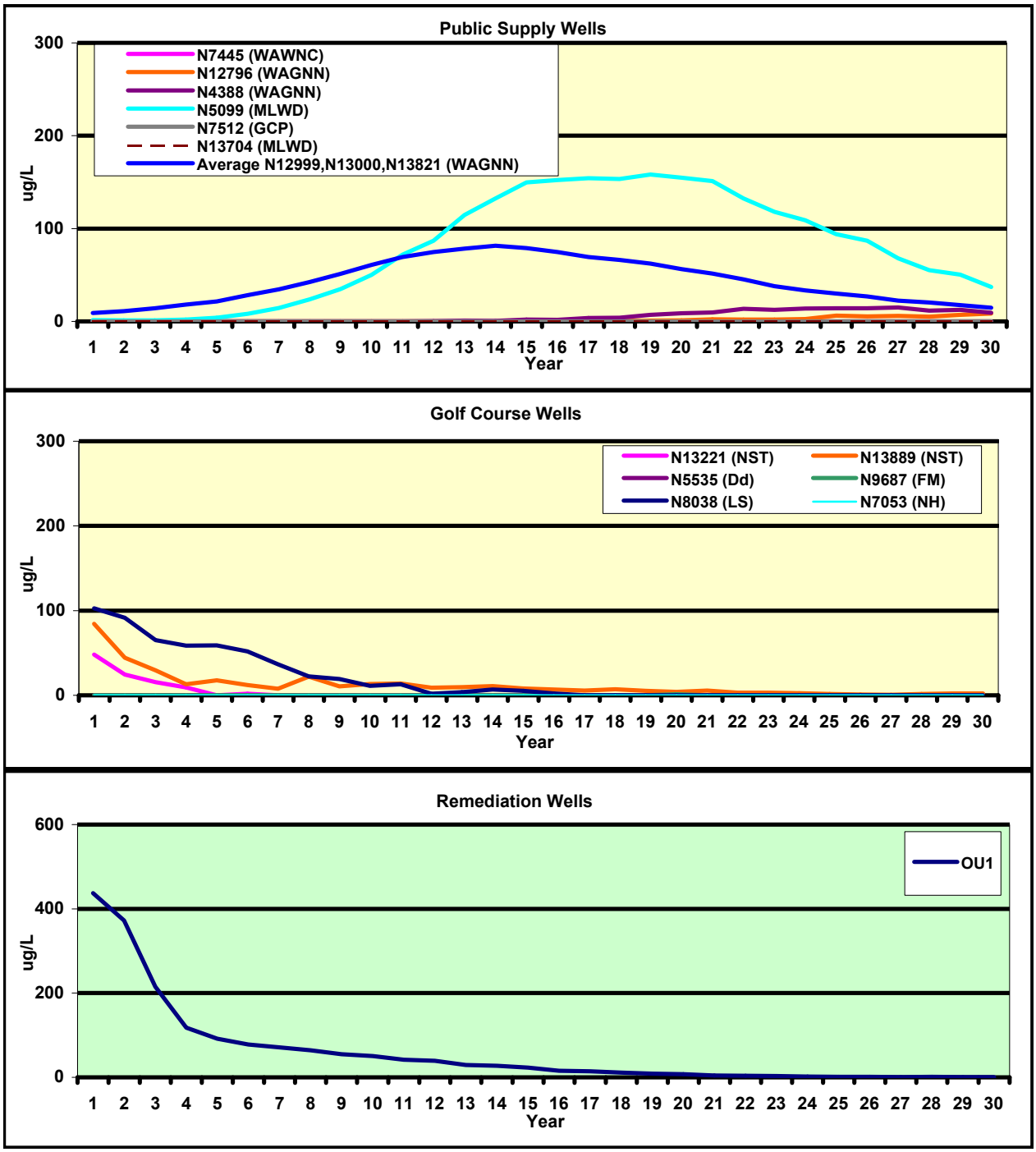


CDM Smith

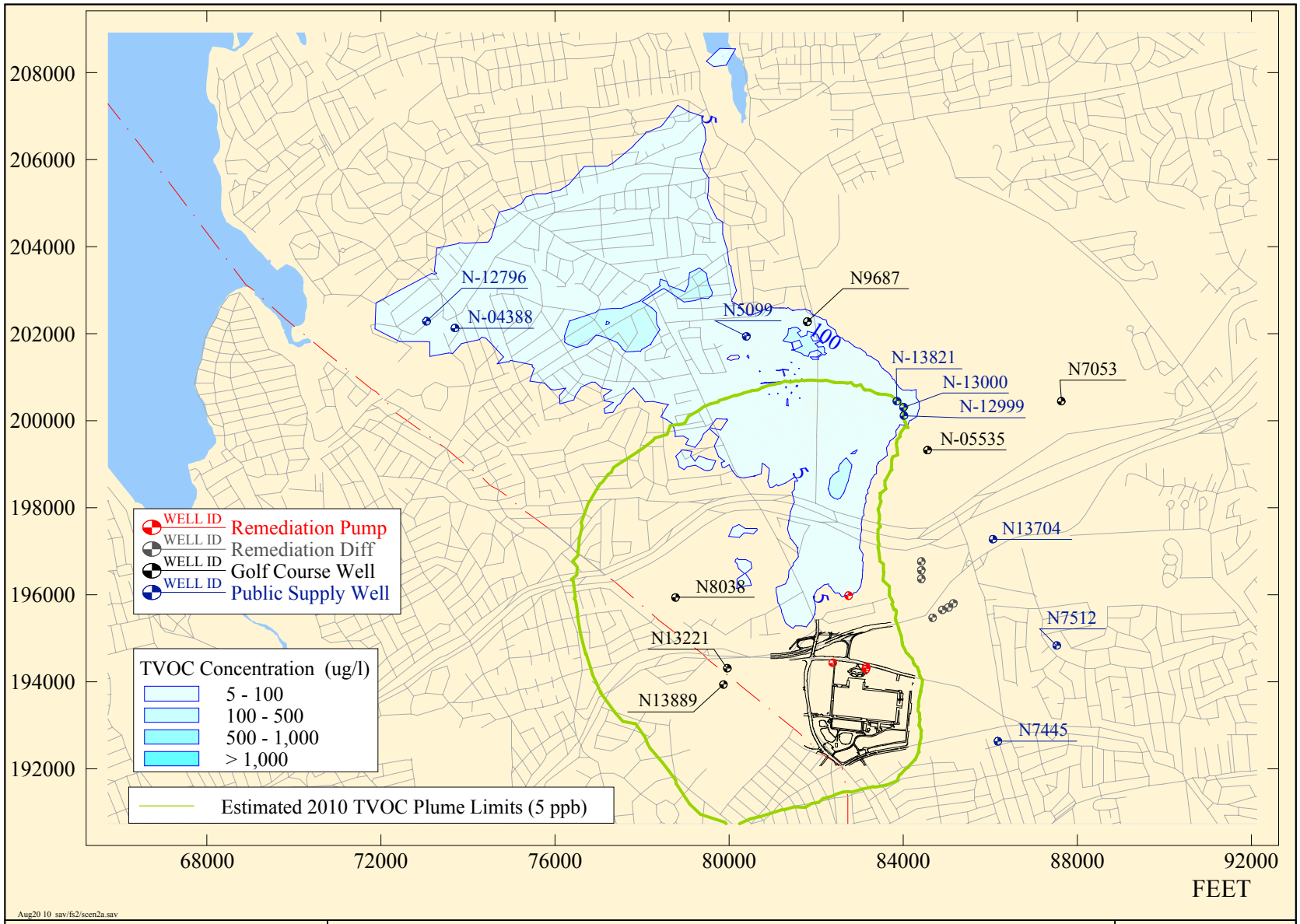
Maximum Simulated TVOC Concentration for 30 Years
No Action Scenario
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
3-7

Figure 3-8
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 1



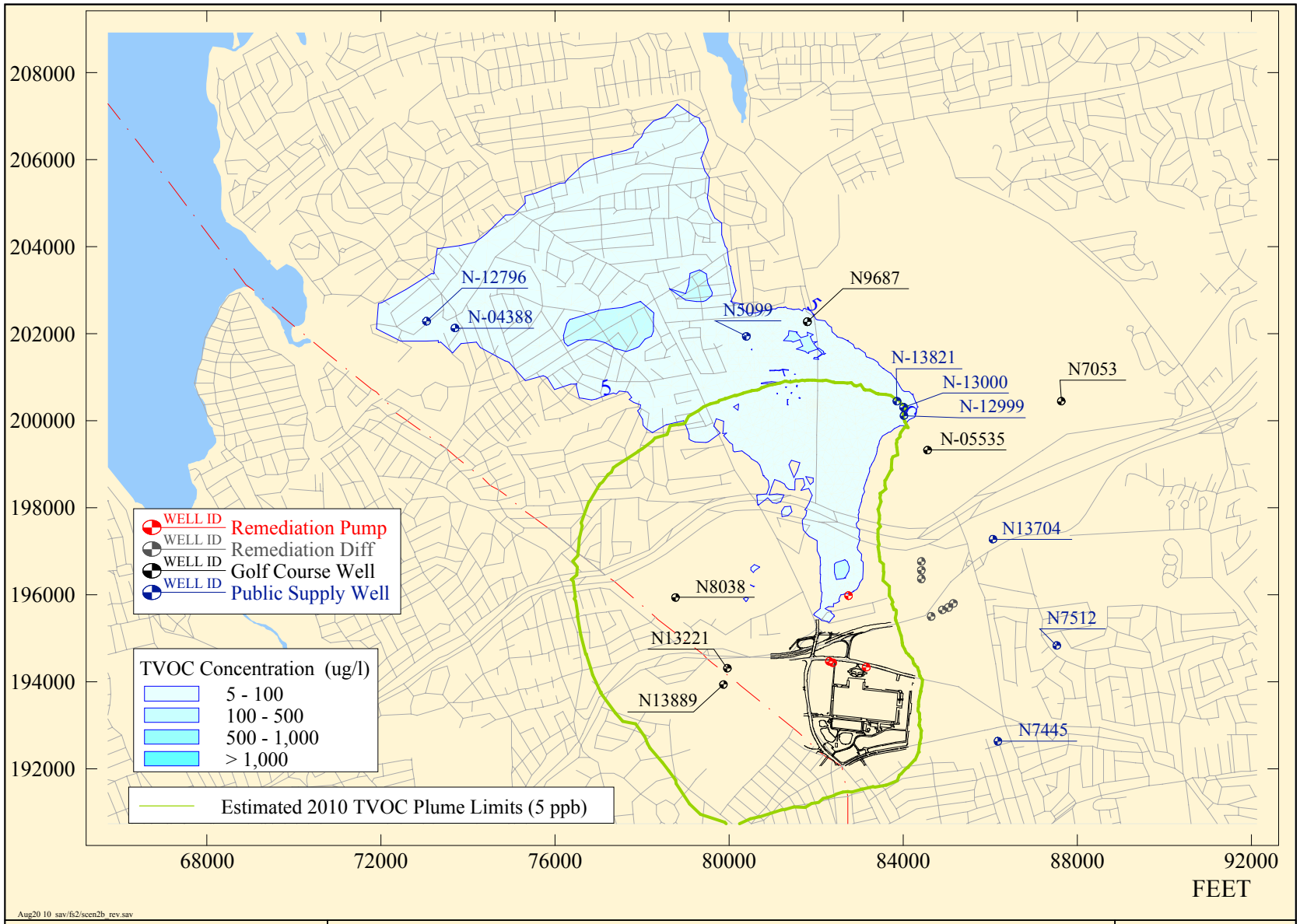
Note: The concentrations presented in the above graphs are simulated annual average concentrations.



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 2A
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

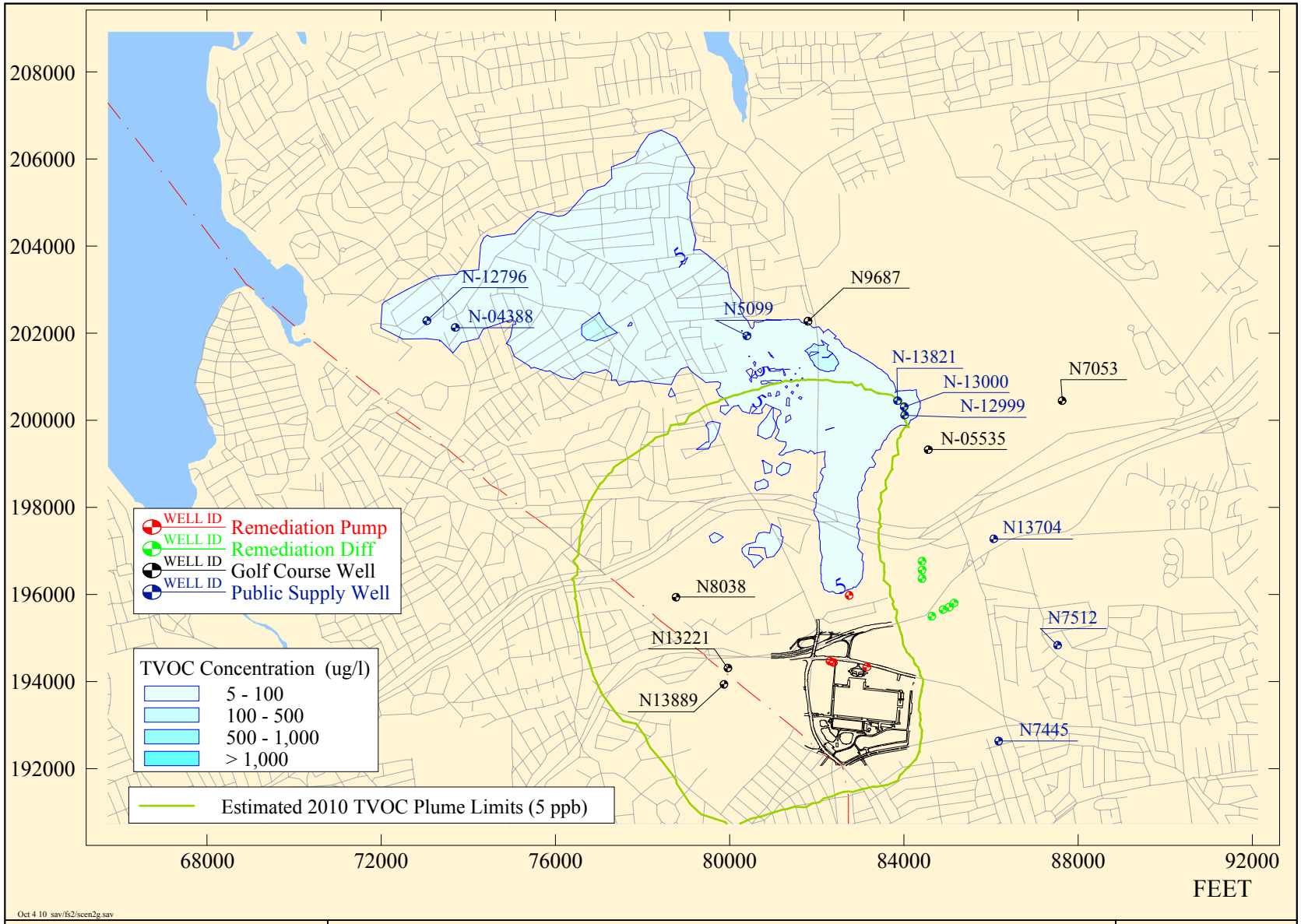
FIGURE
3-9



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 2B
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
3-10

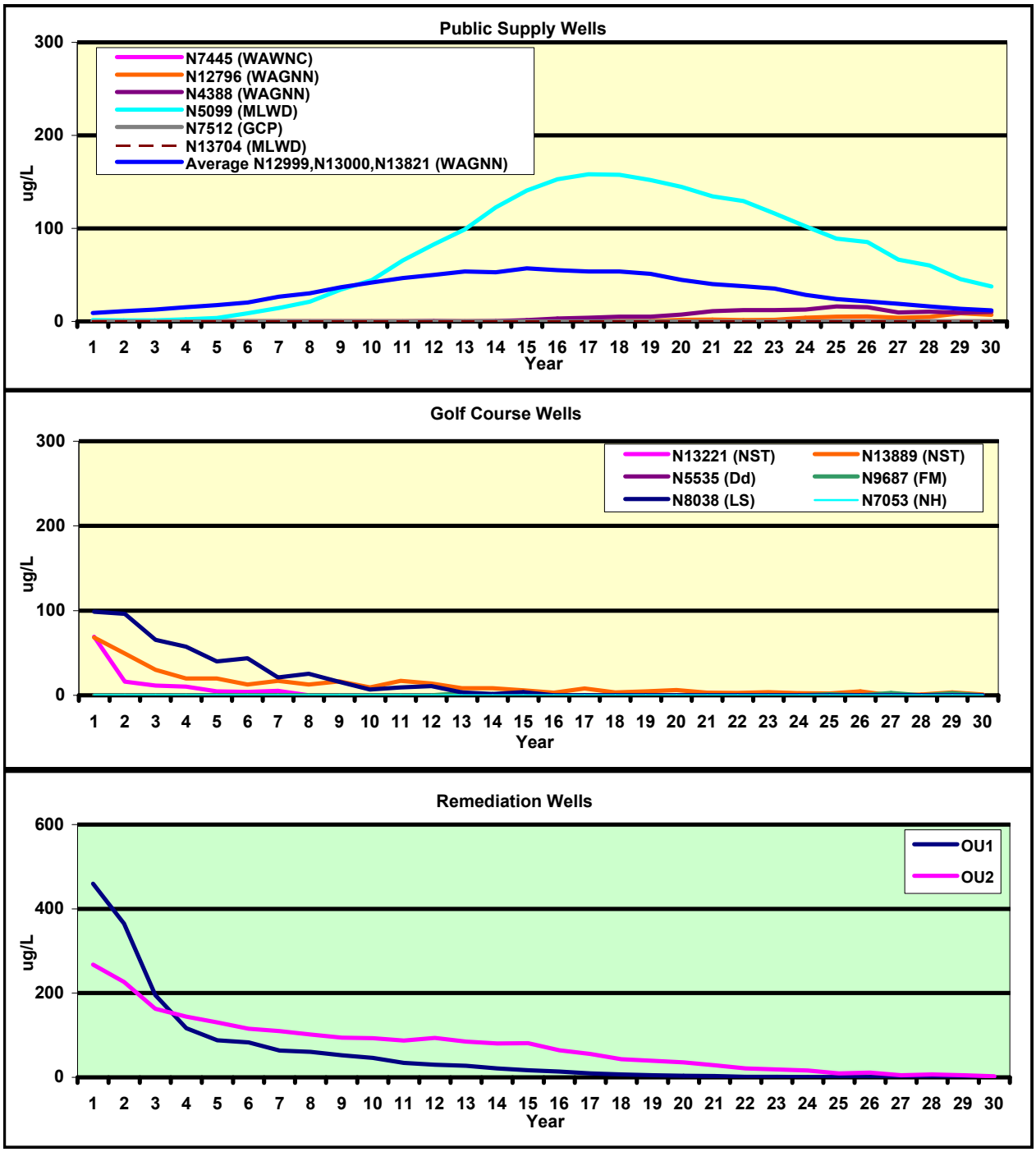


CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 2C
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

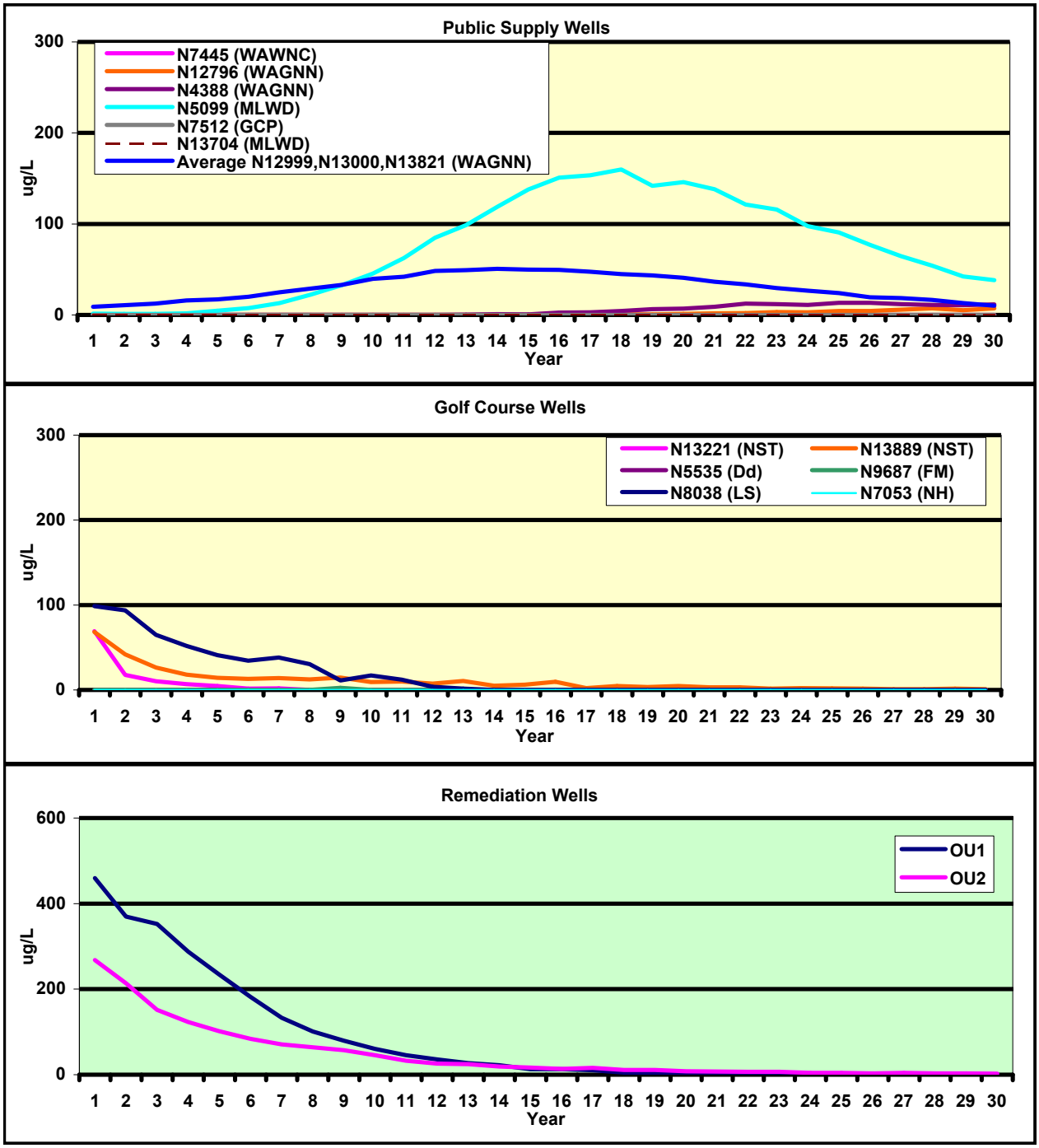
FIGURE
3-11

Figure 3-12
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 2A



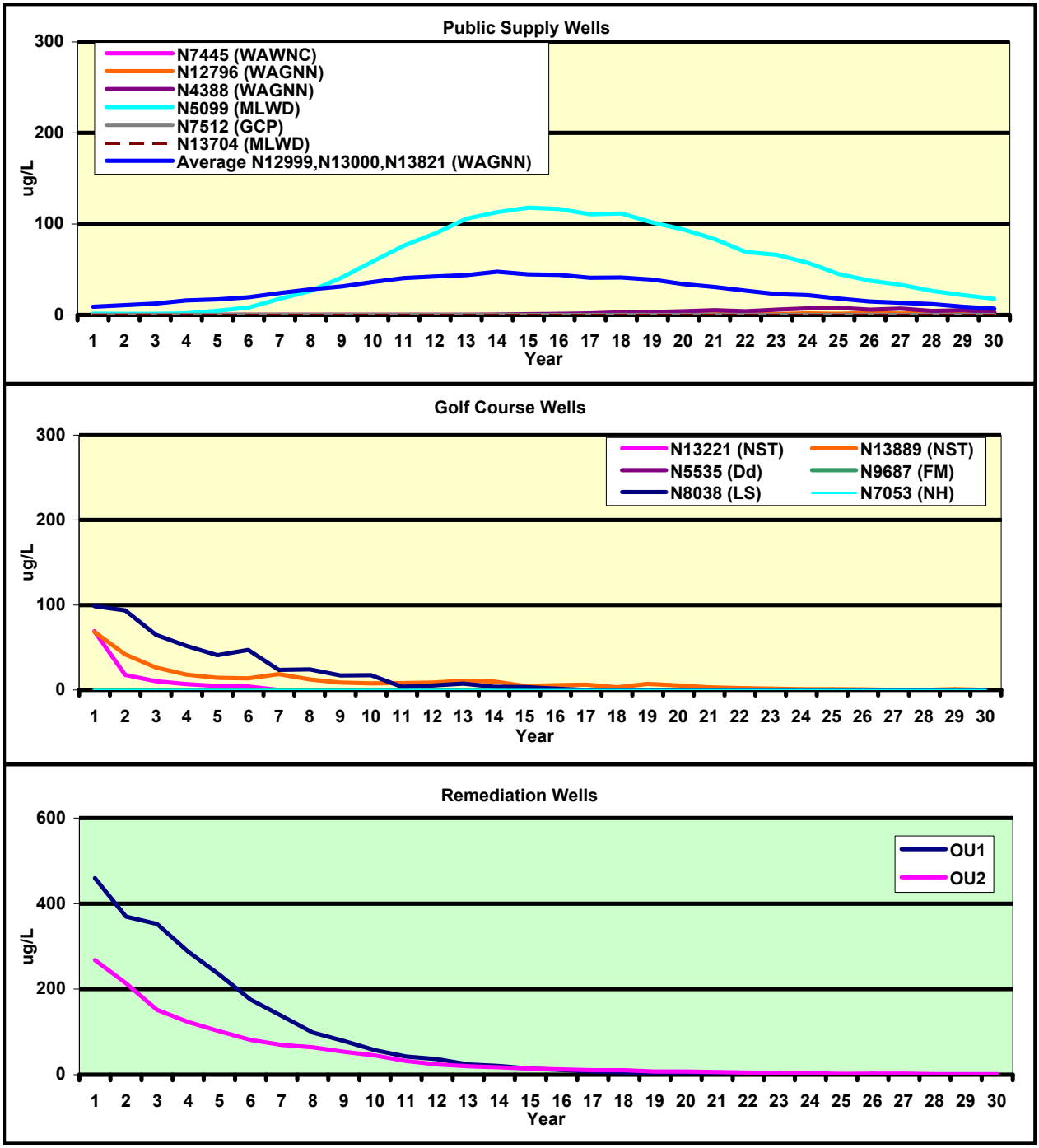
Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-13
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 2B

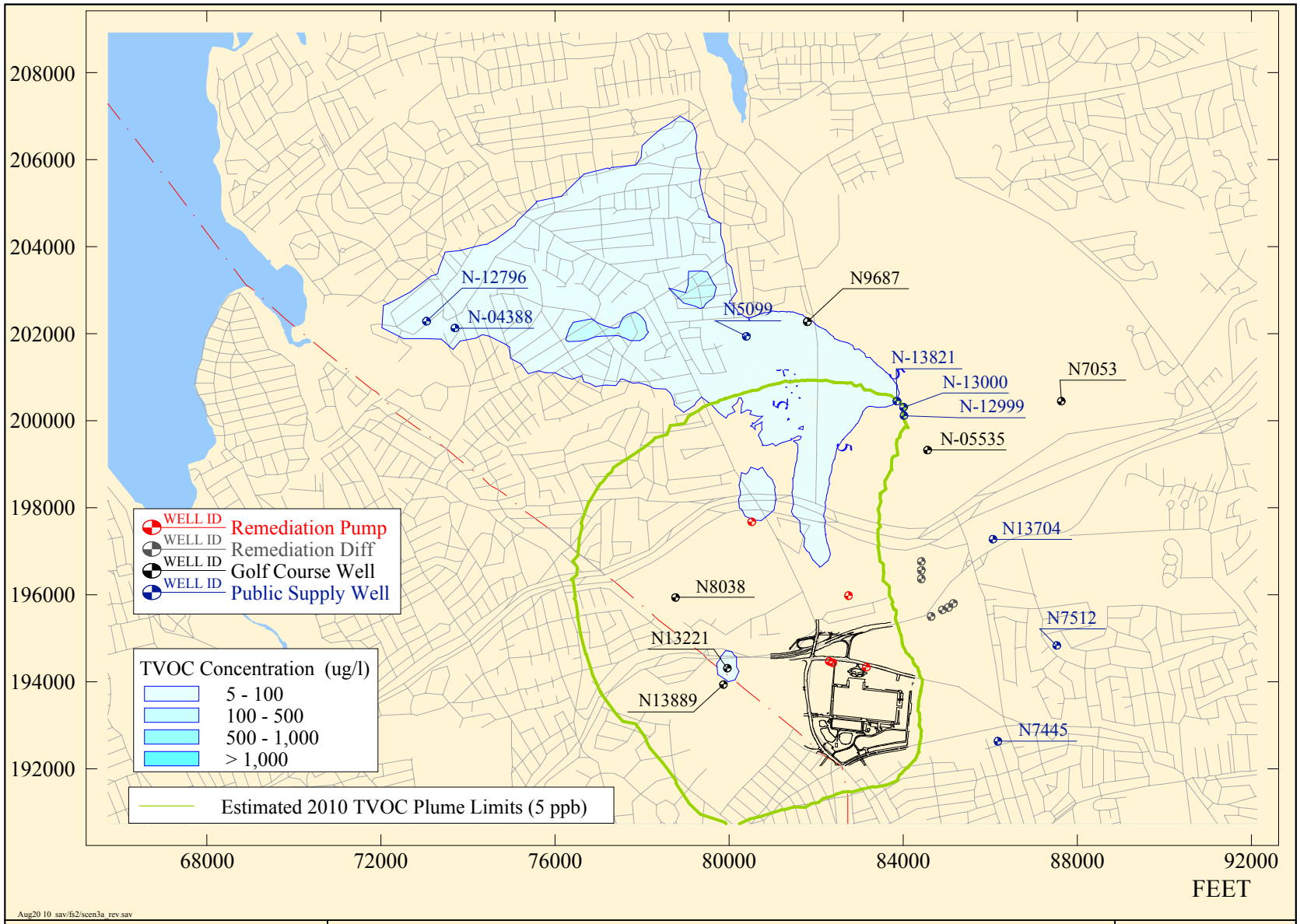


Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-14
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 2C



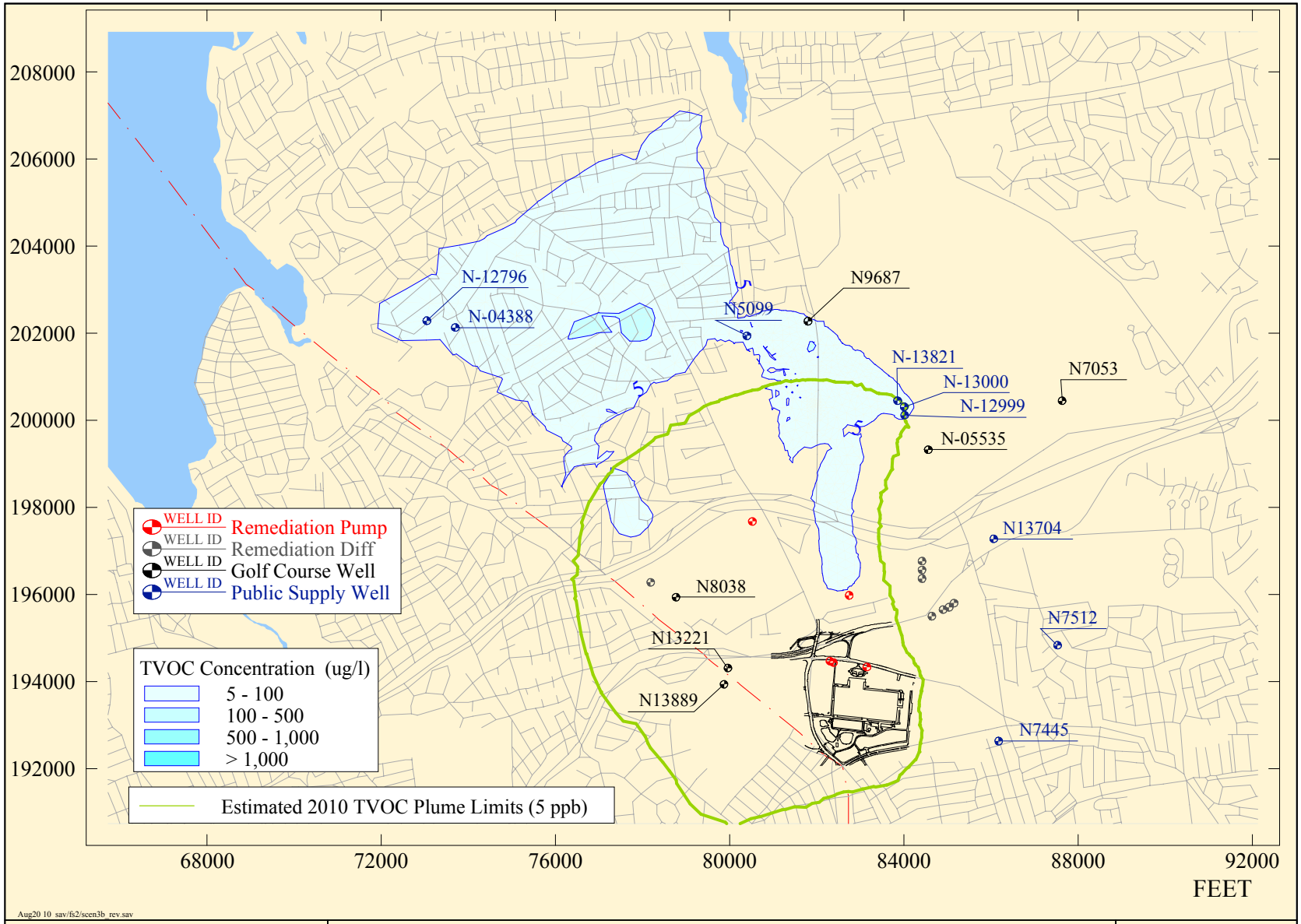
Note: The concentrations presented in the above graphs are simulated annual average concentration.



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 3A
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
3-15

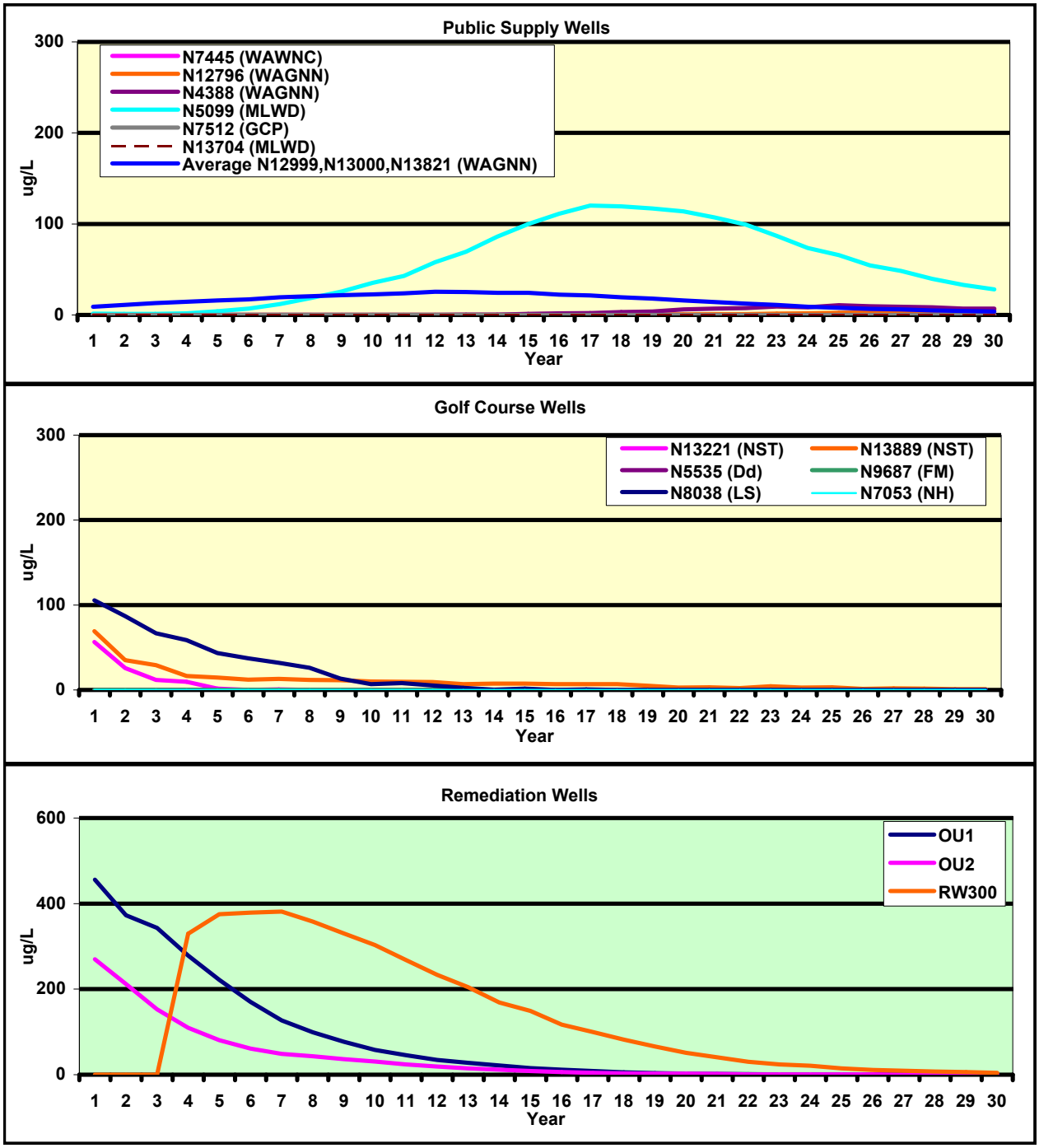


CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 3B
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

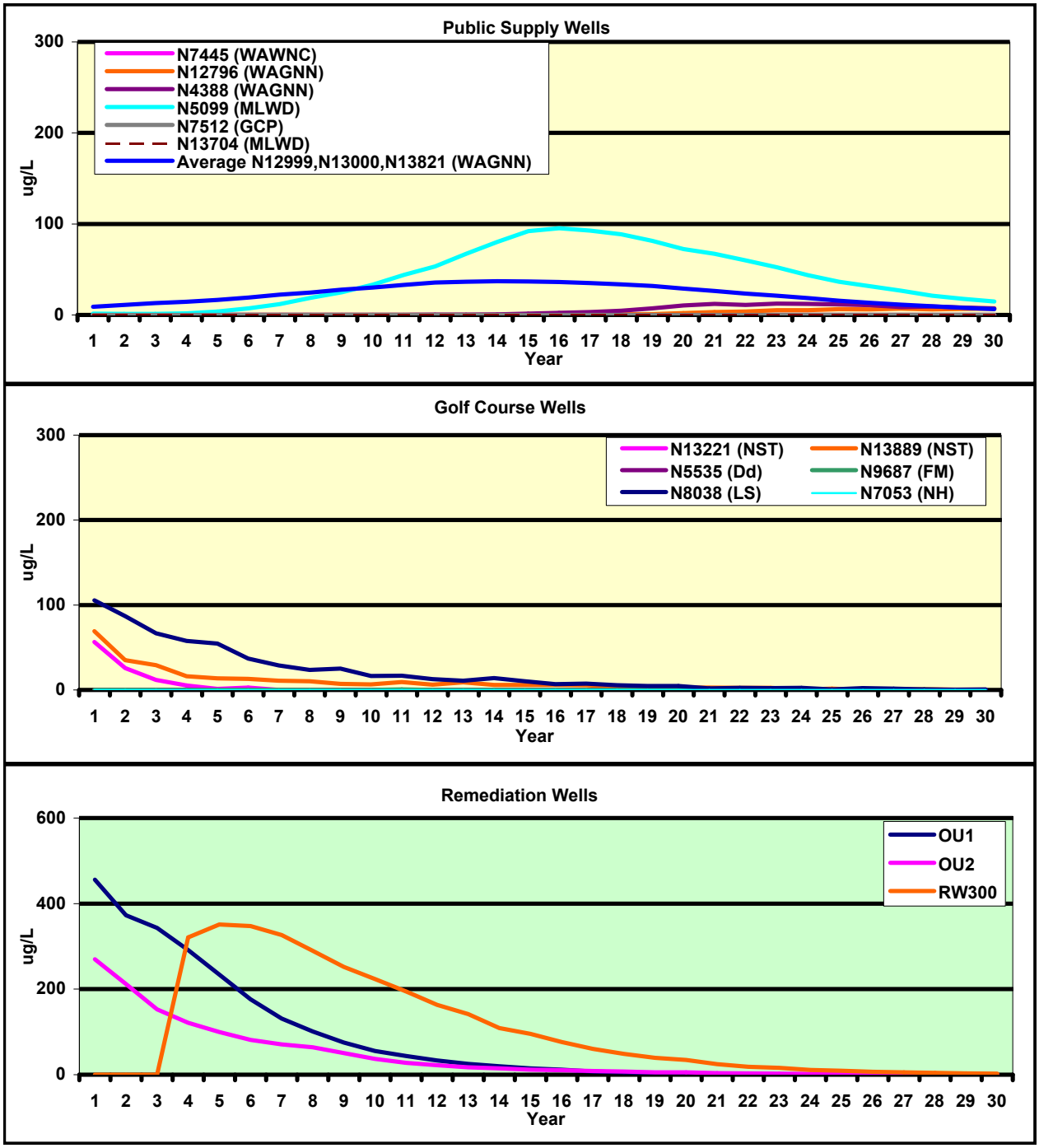
FIGURE
3-16

Figure 3-17
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 3A

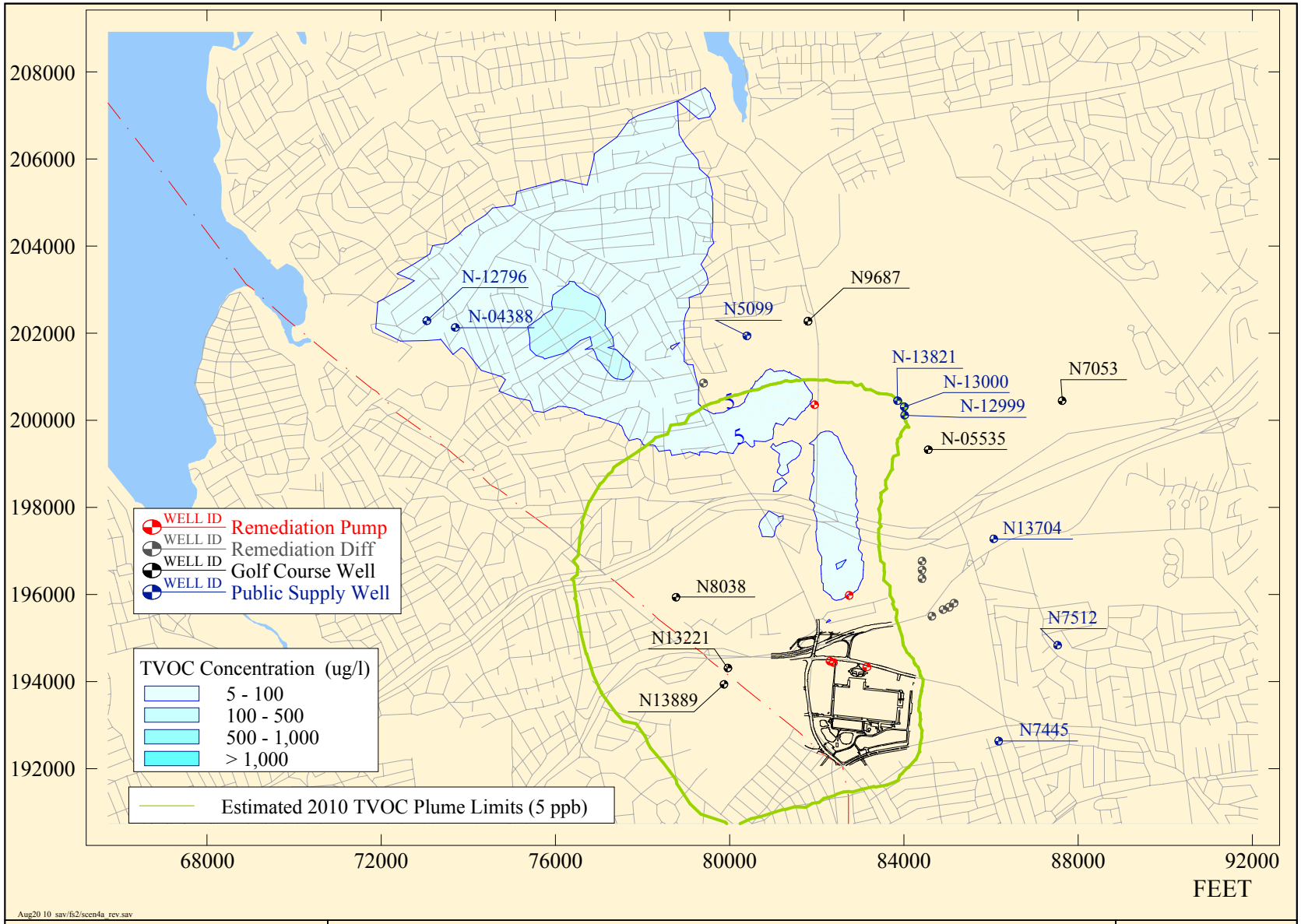


Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-18
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 3B



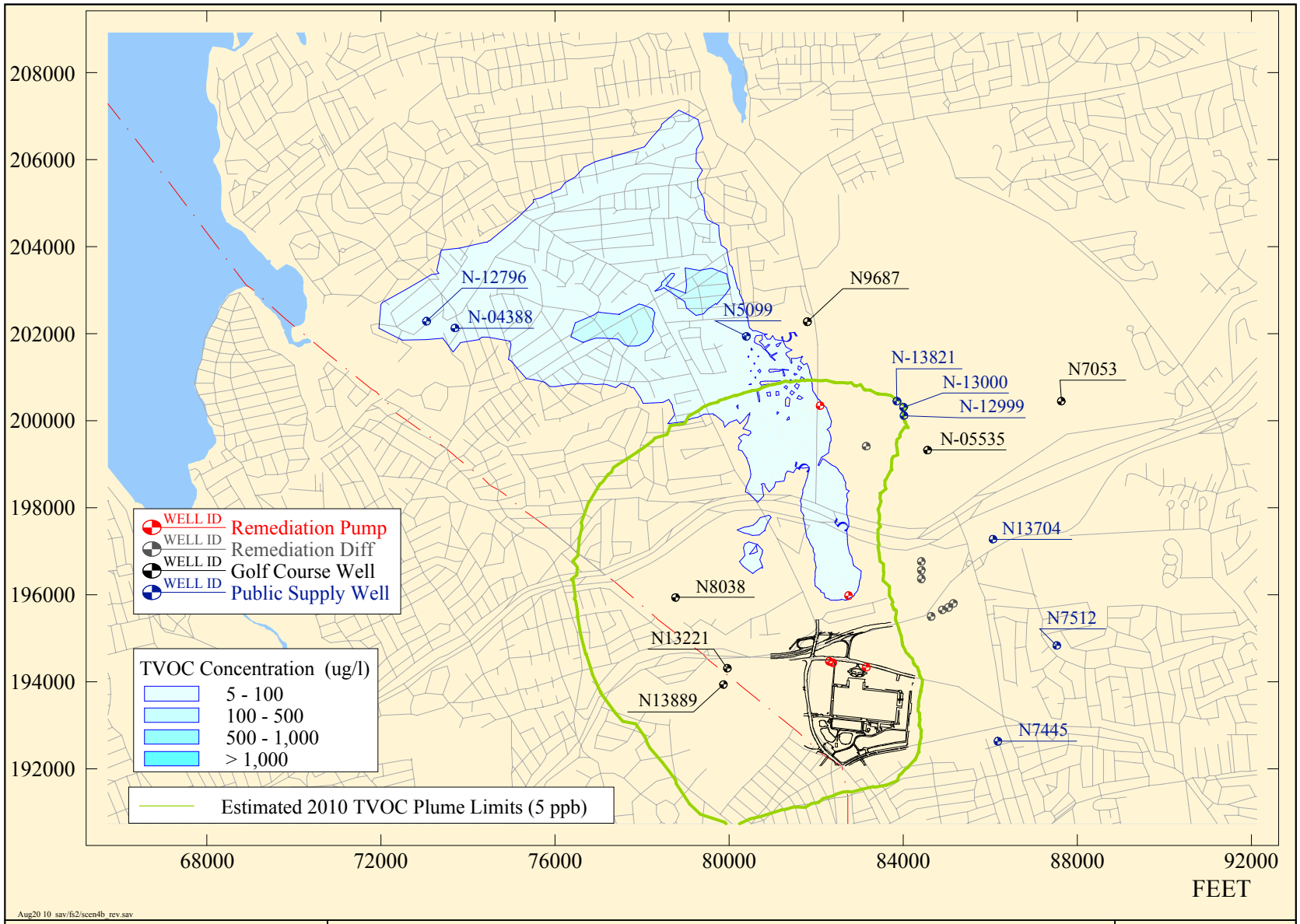
Note: The concentrations presented in the above graphs are simulated annual average concentration.



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 4A
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

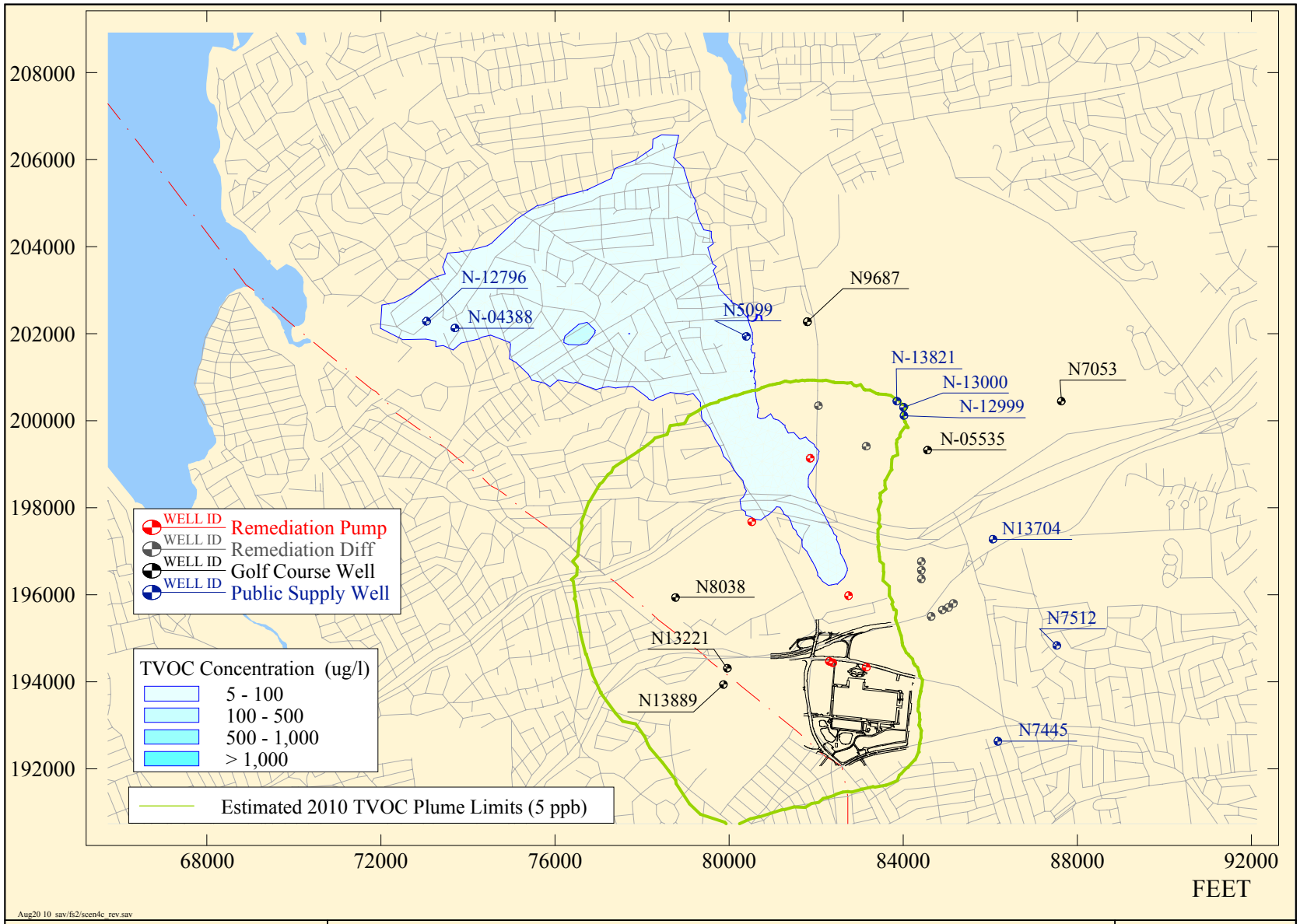
FIGURE
3-19



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 4B
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

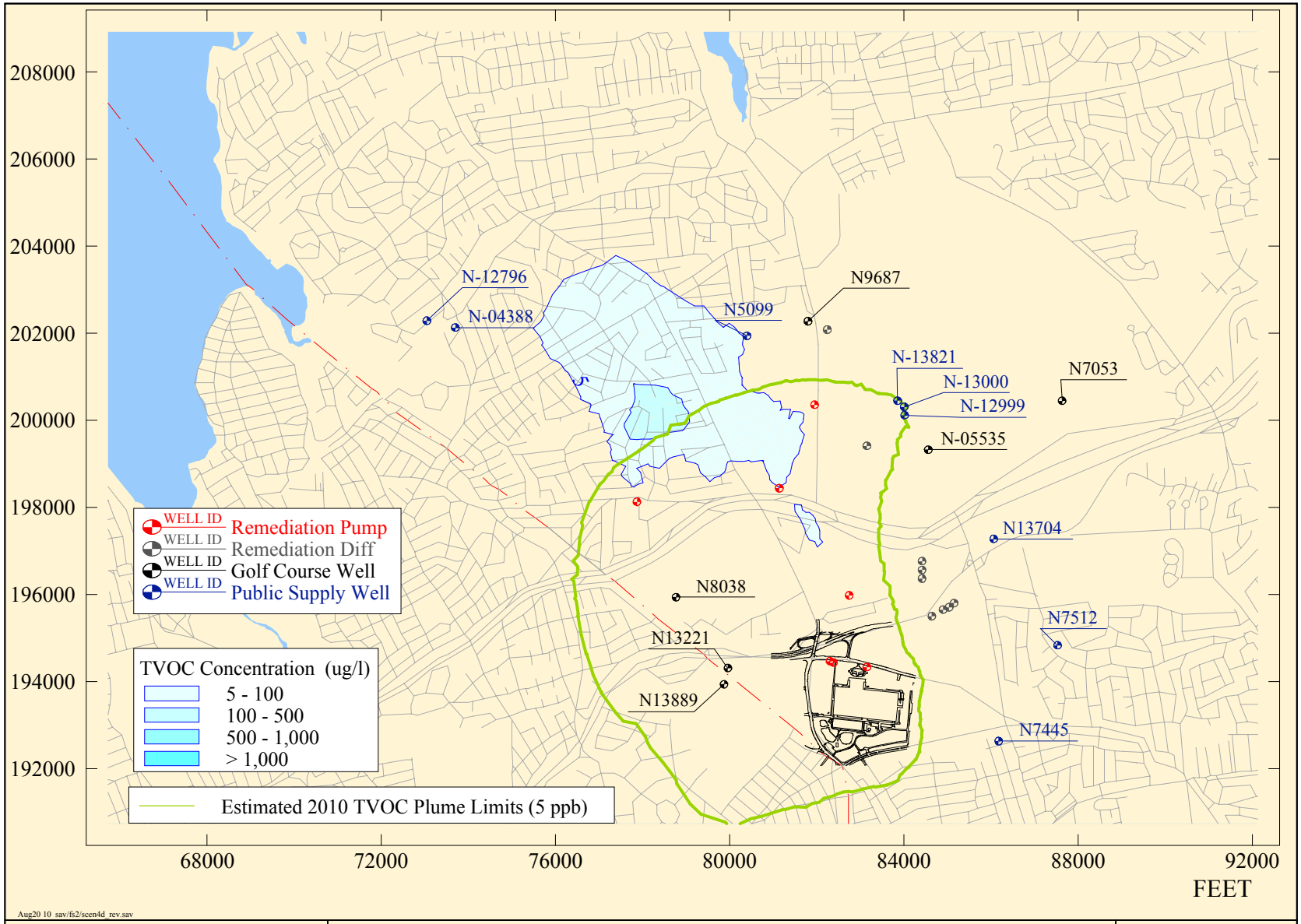
FIGURE
3-20



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 4C
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

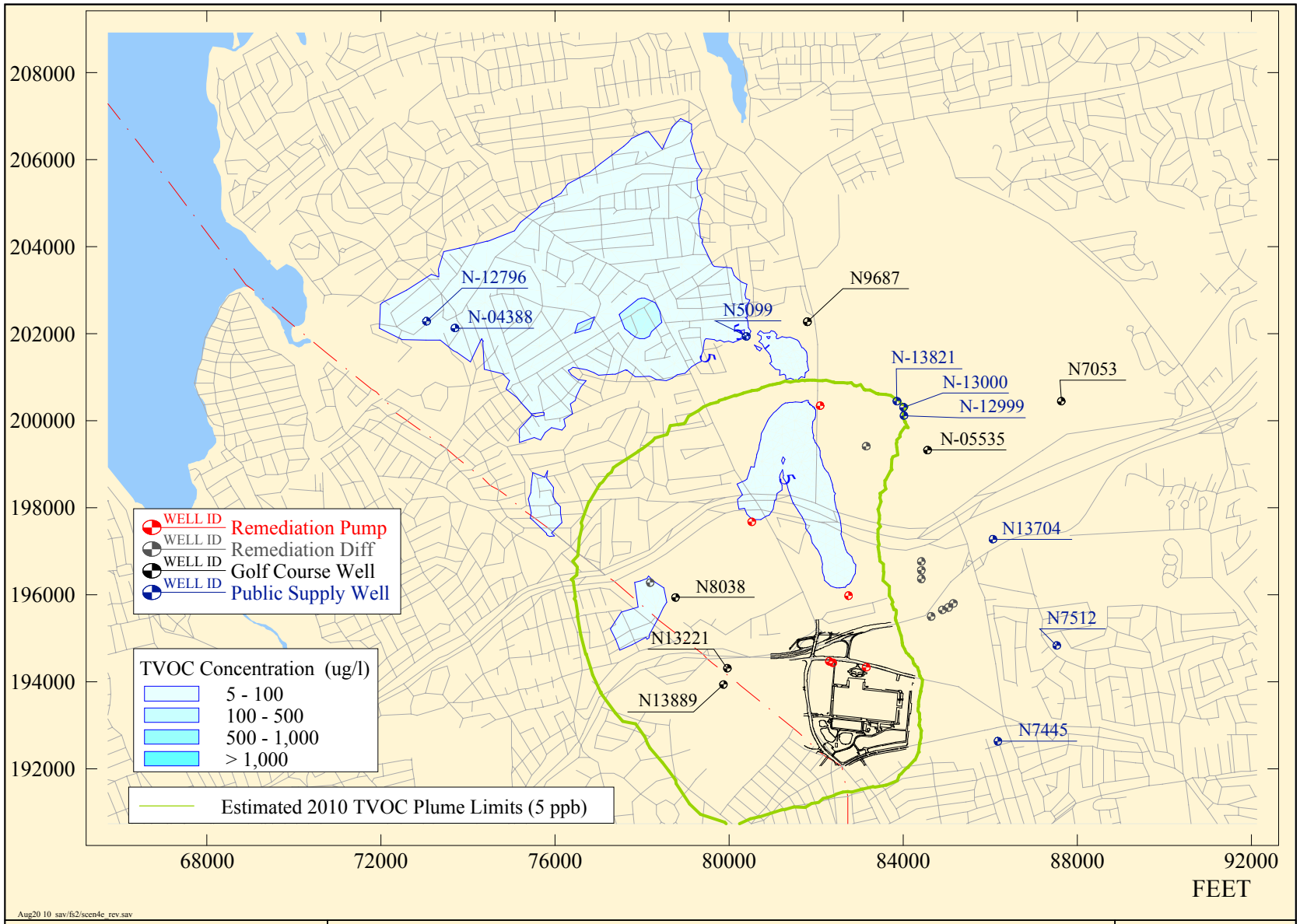
FIGURE
3-21



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 4D
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

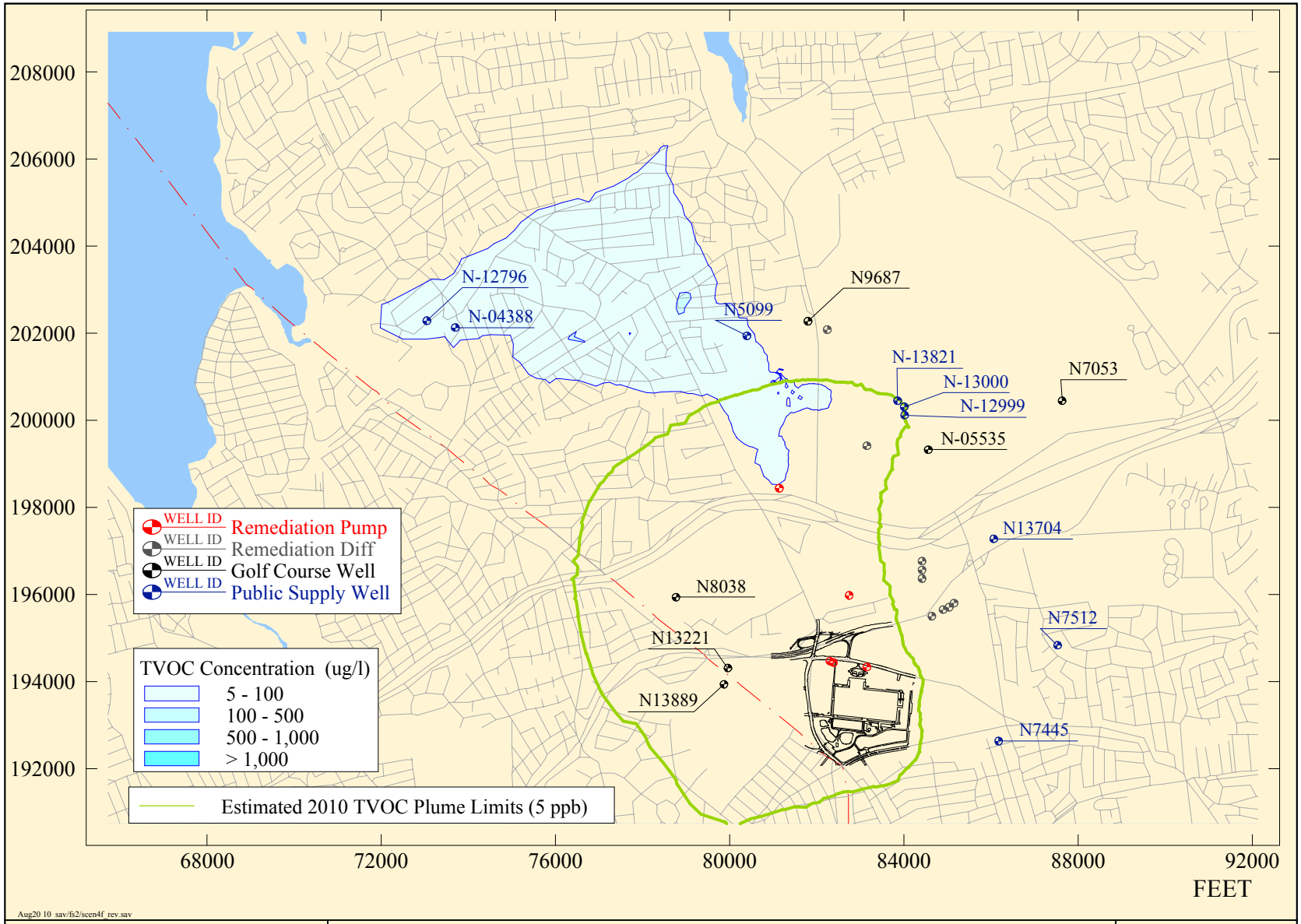
FIGURE
3-22



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 4E
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

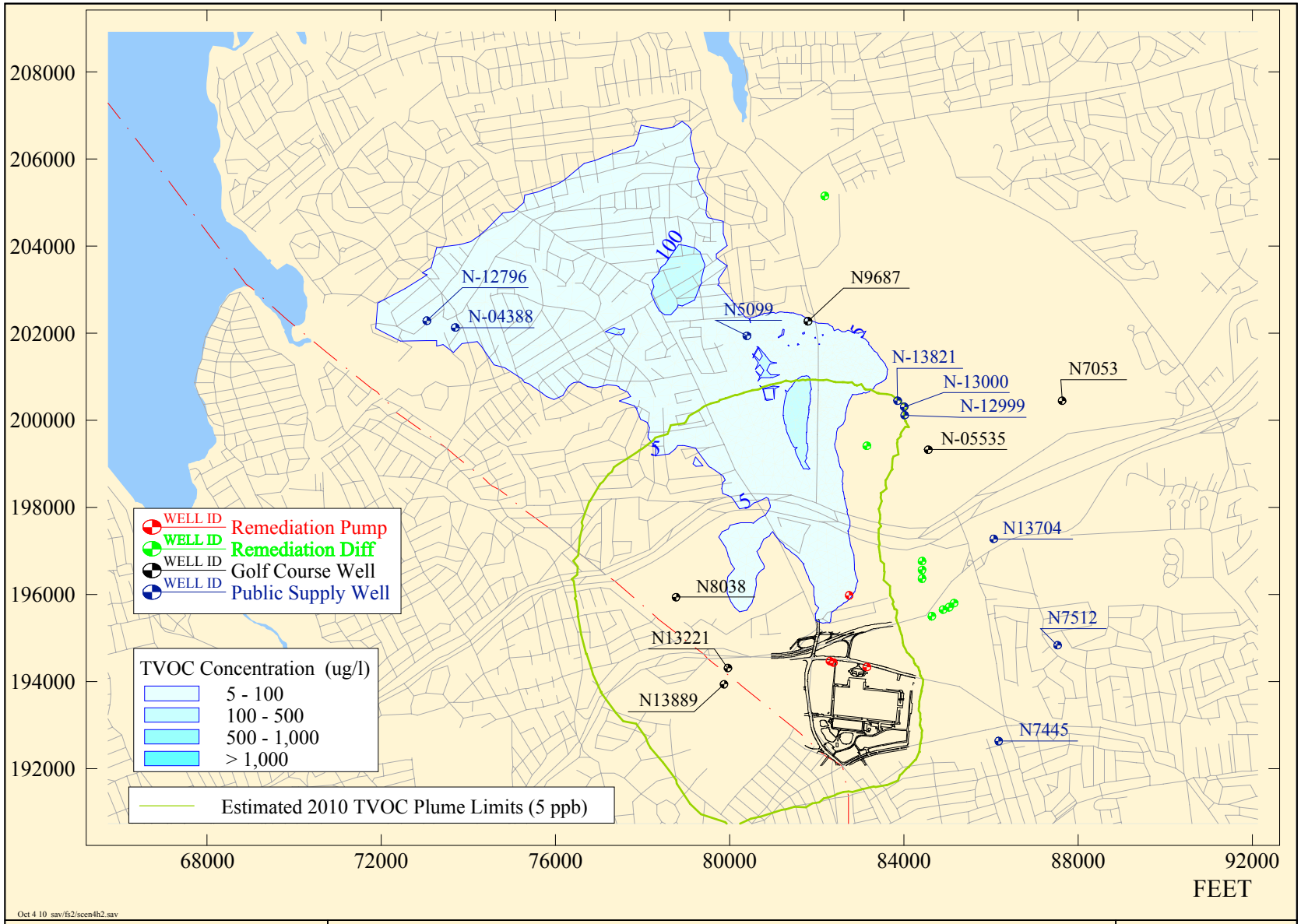
FIGURE
3-23



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 4F
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

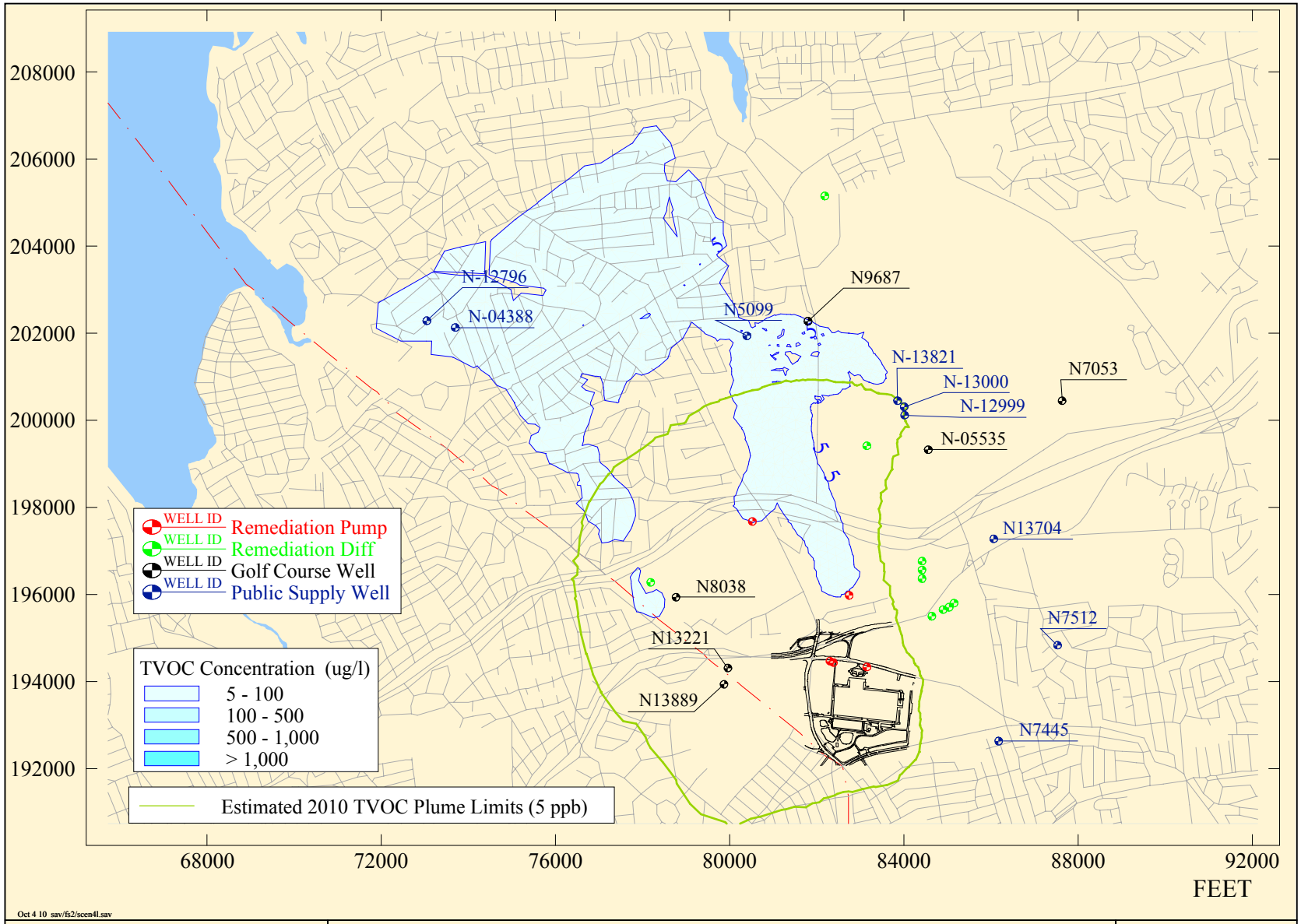
FIGURE
3-24



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 4G
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
3-25

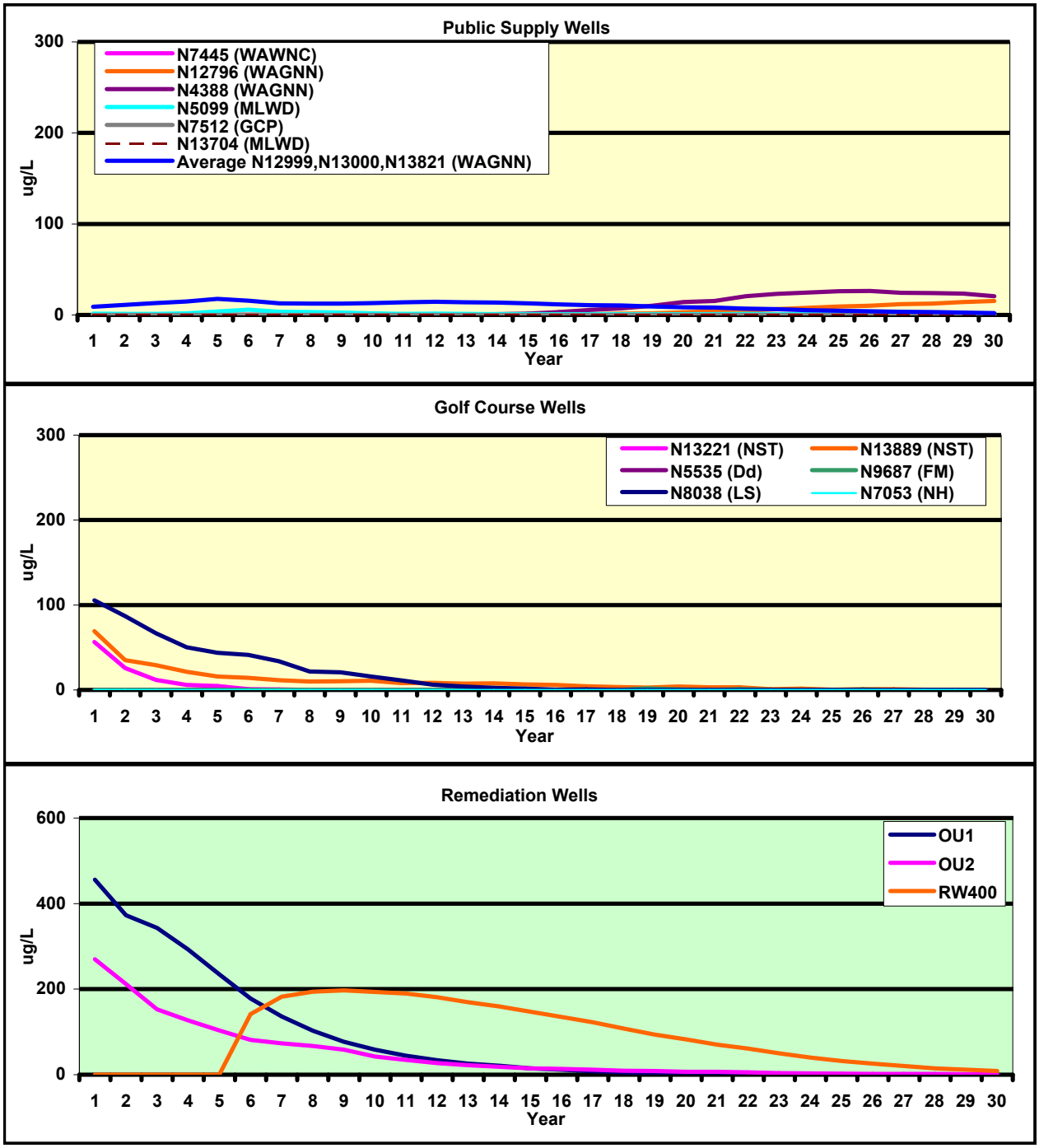


CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 4H
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

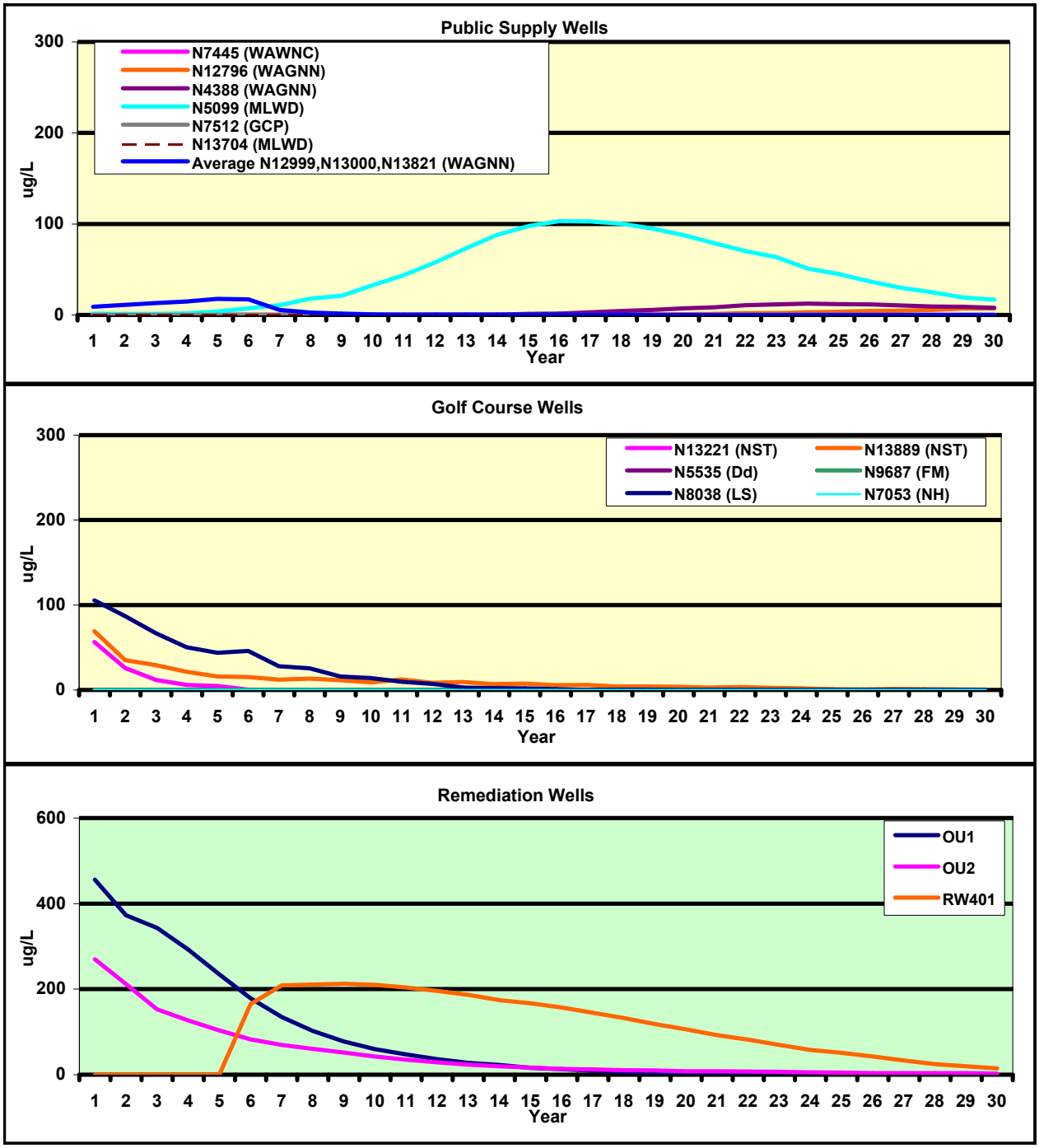
FIGURE
3-26

Figure 3-27
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 4A



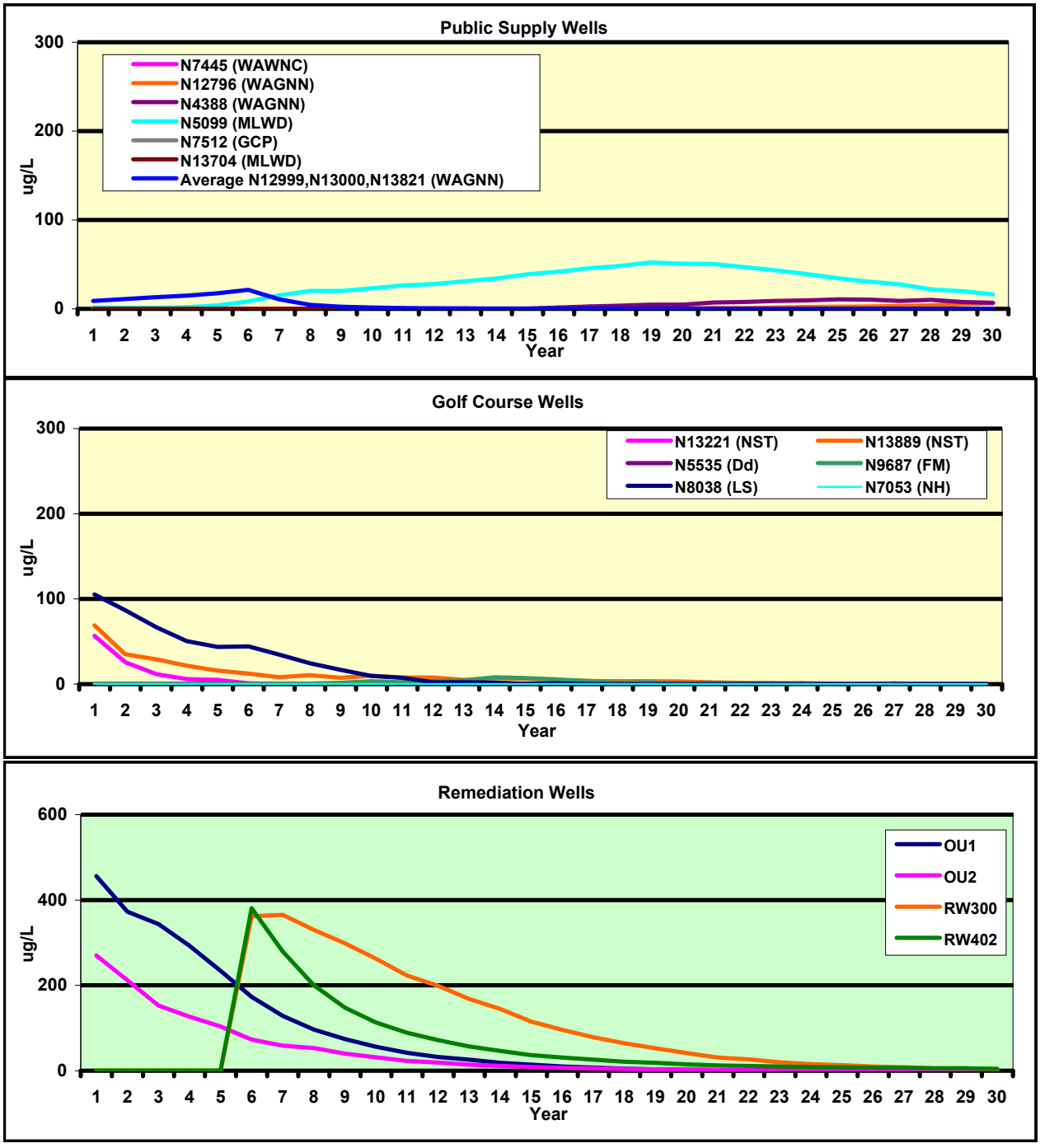
Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-28
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 4B



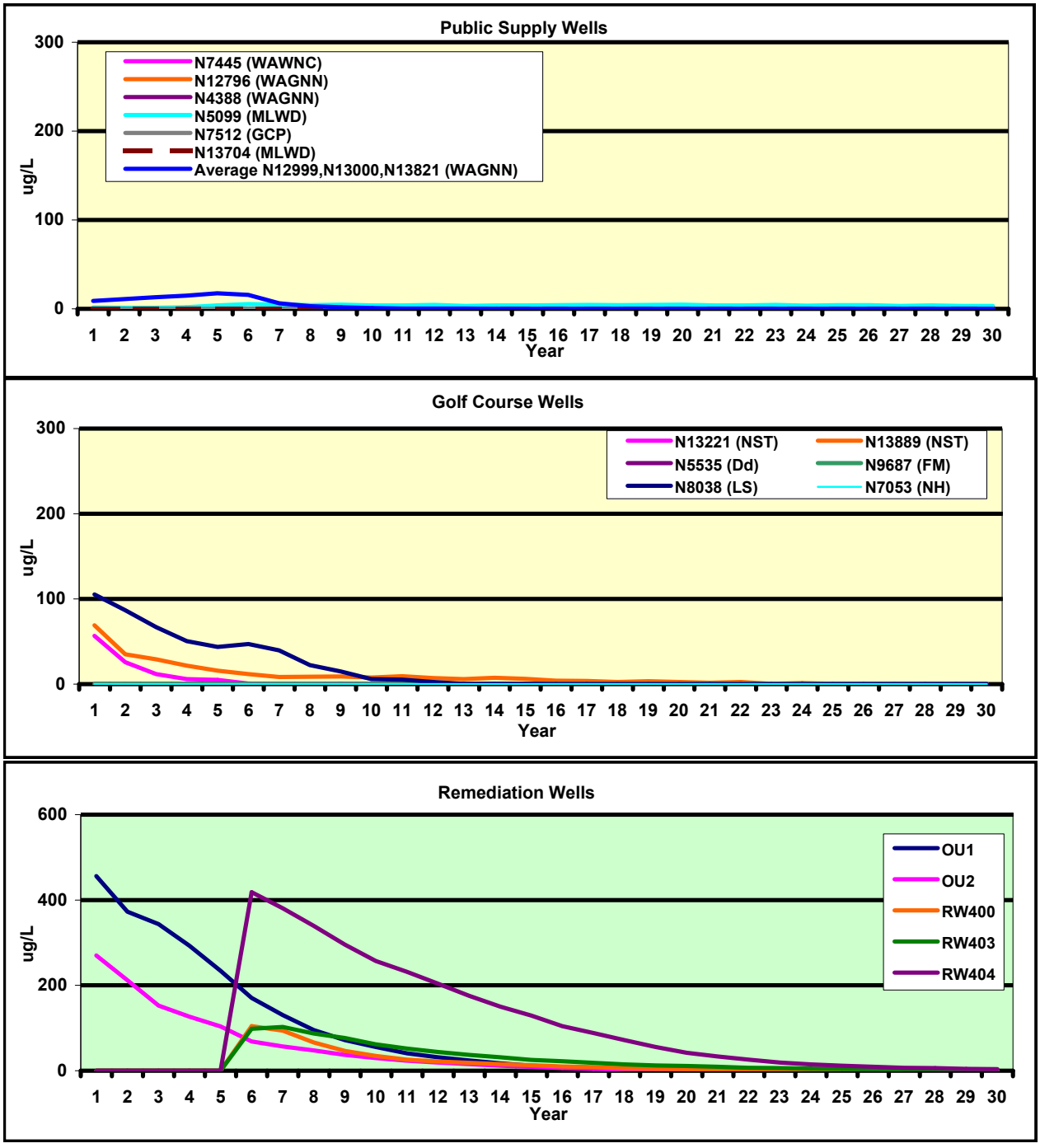
Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-29
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 4C



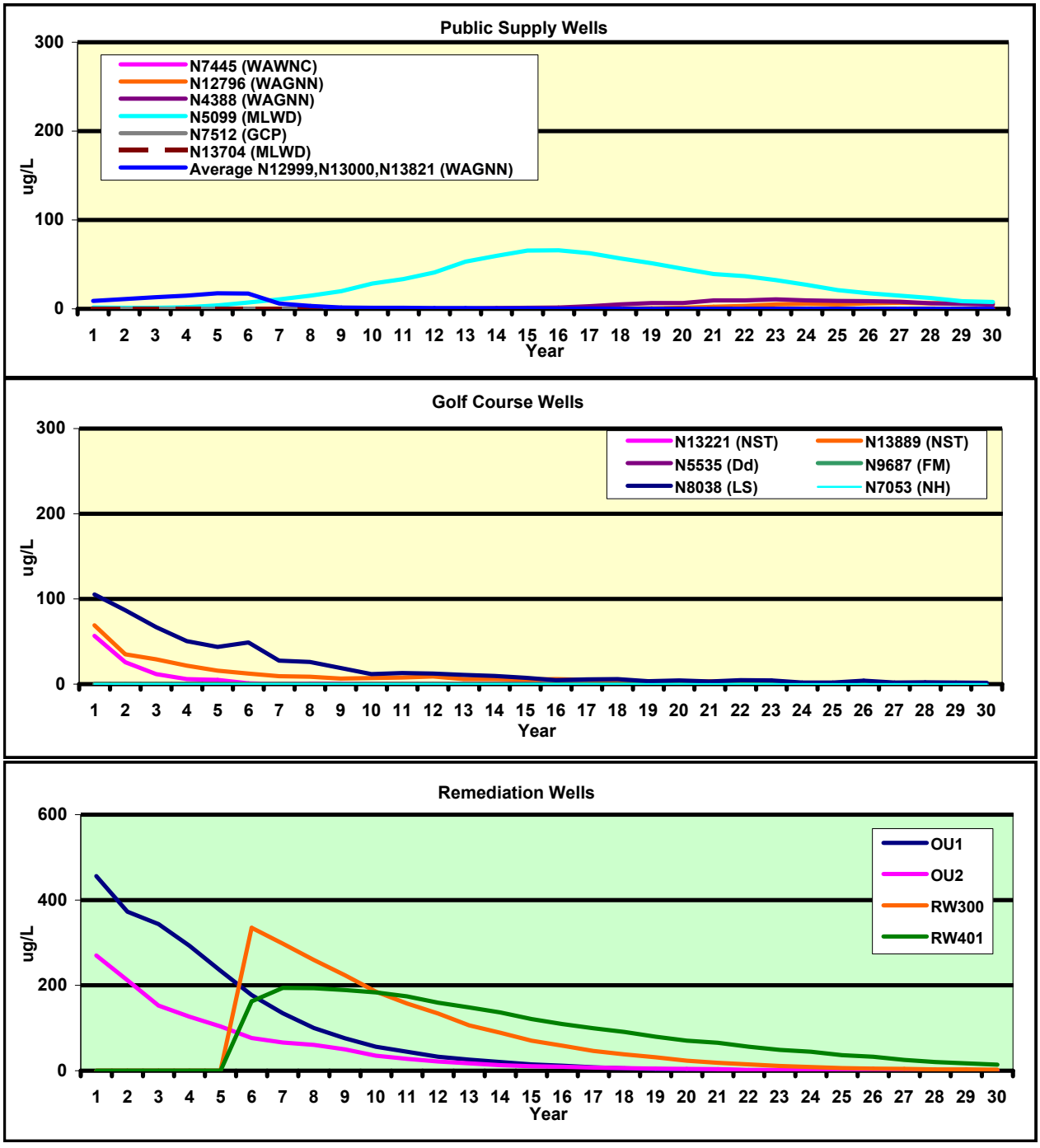
Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-30
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 4D



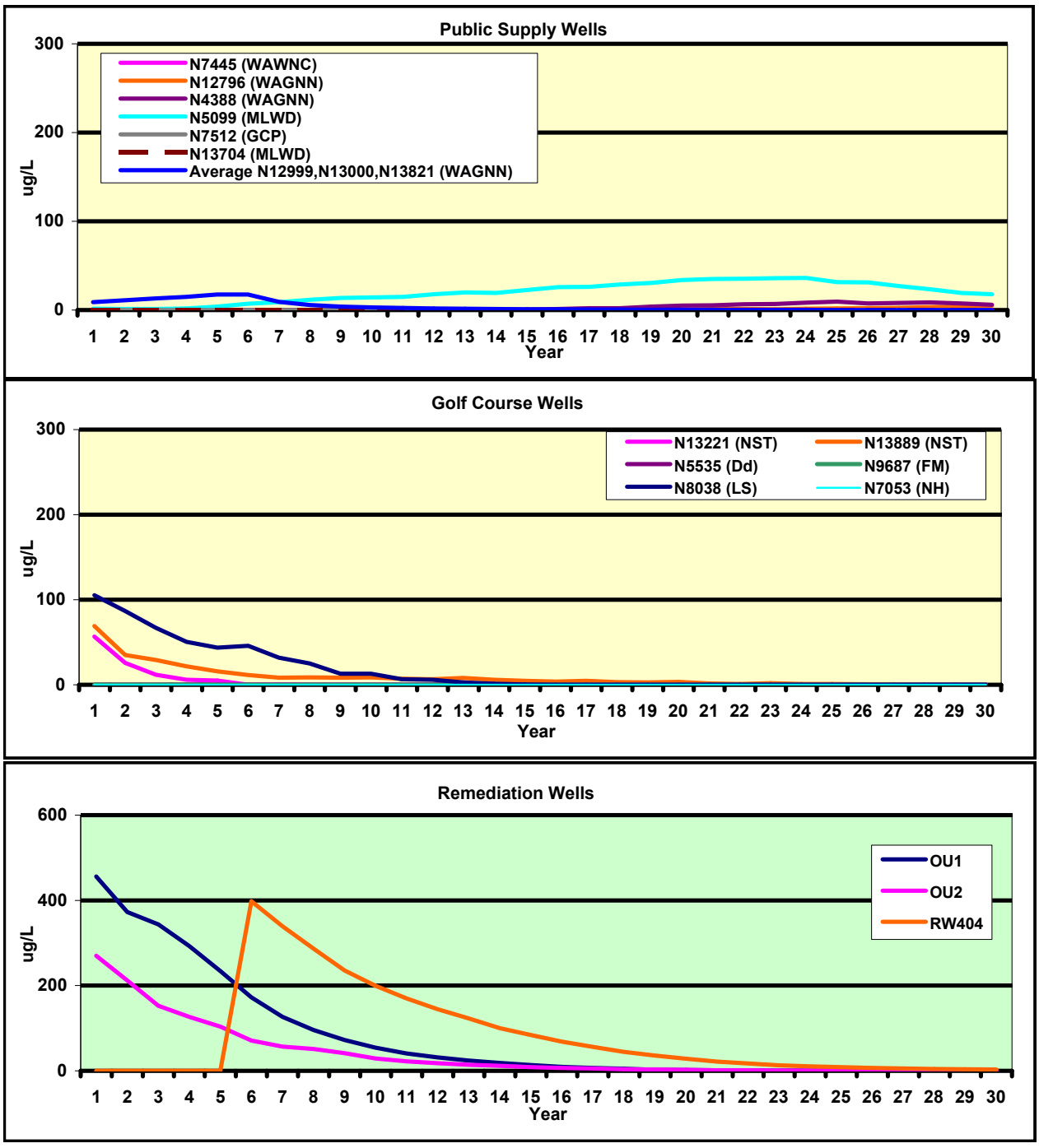
Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-31
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 4E



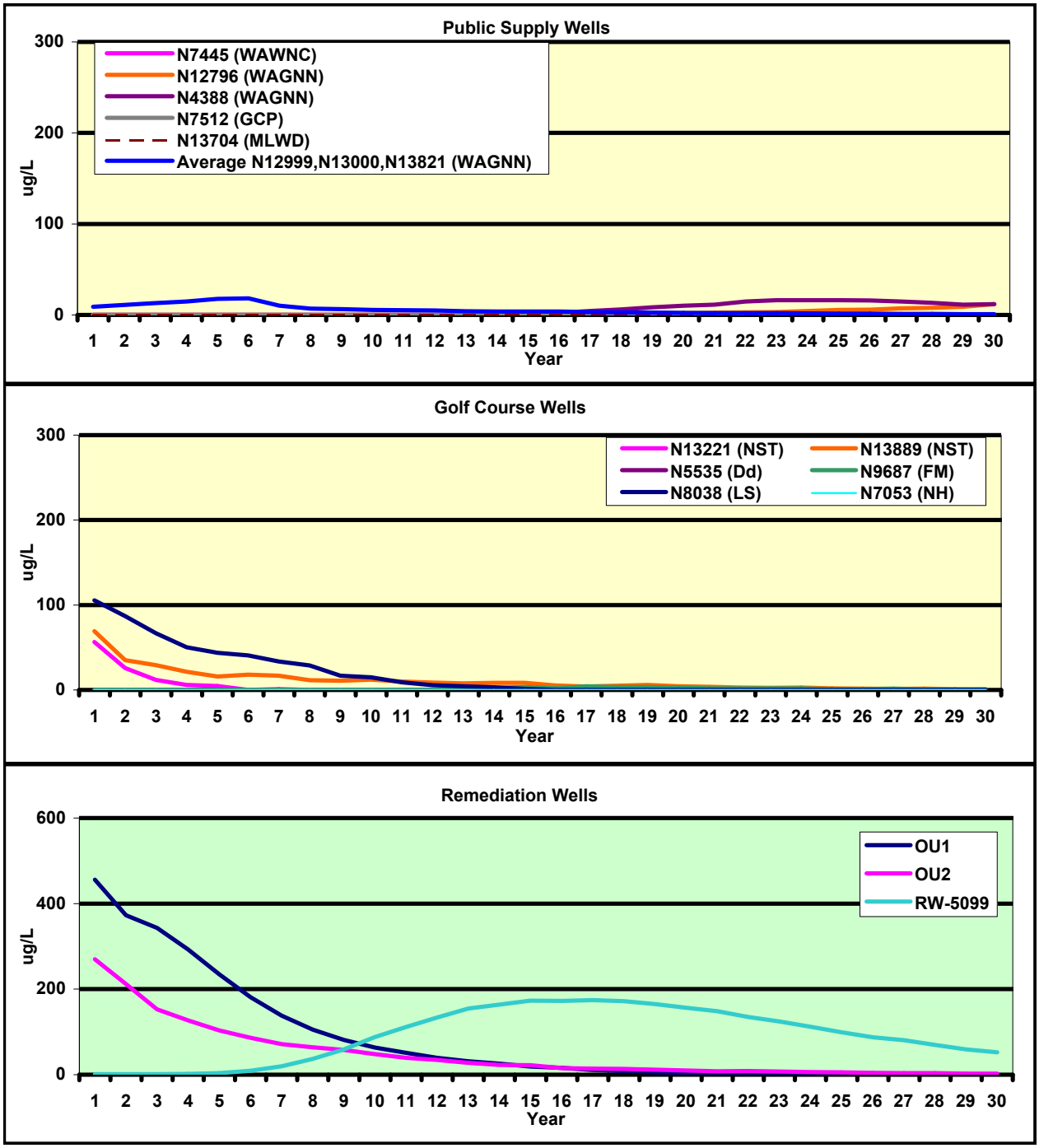
Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-32
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 4F



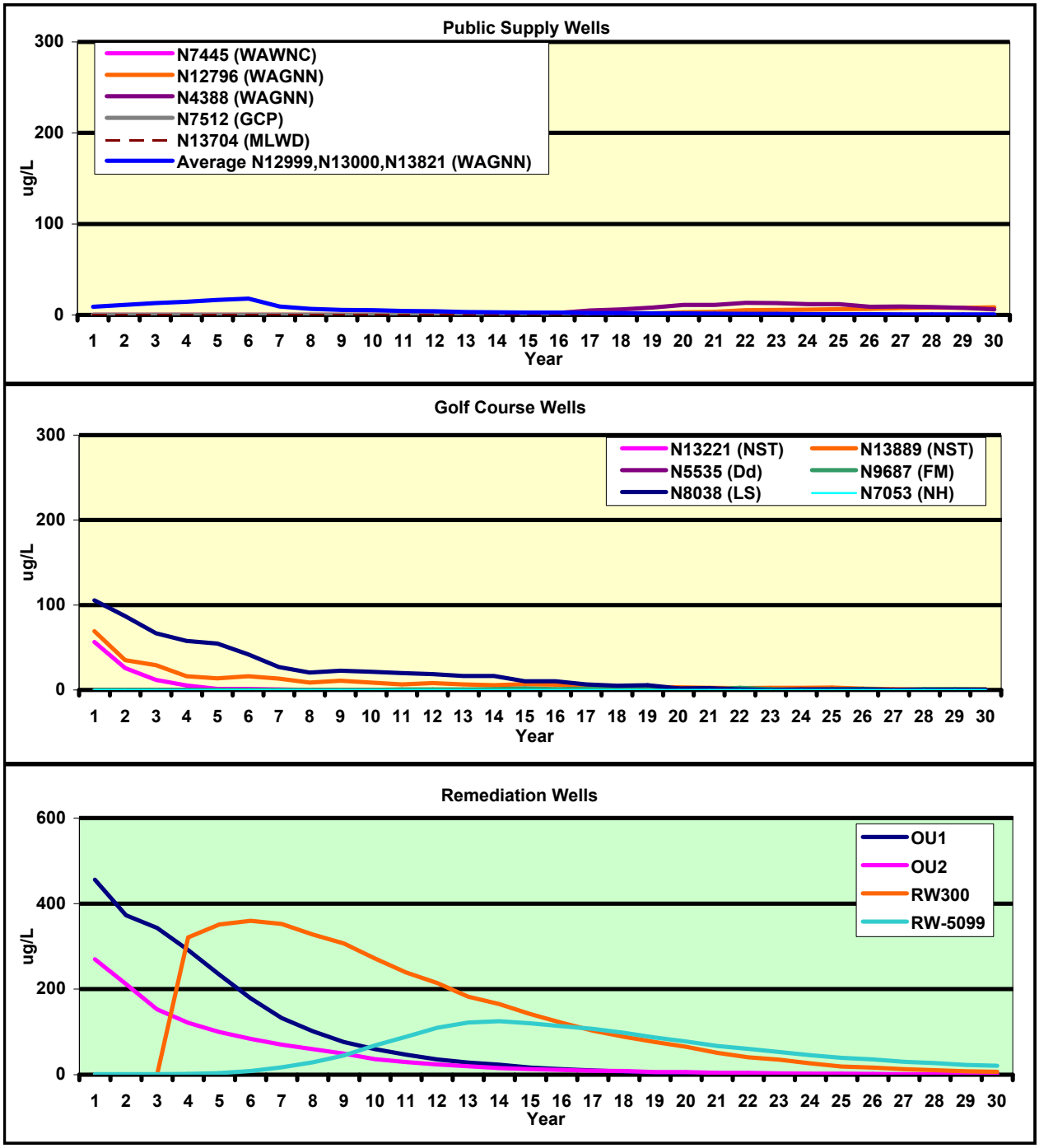
Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-33
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 4G

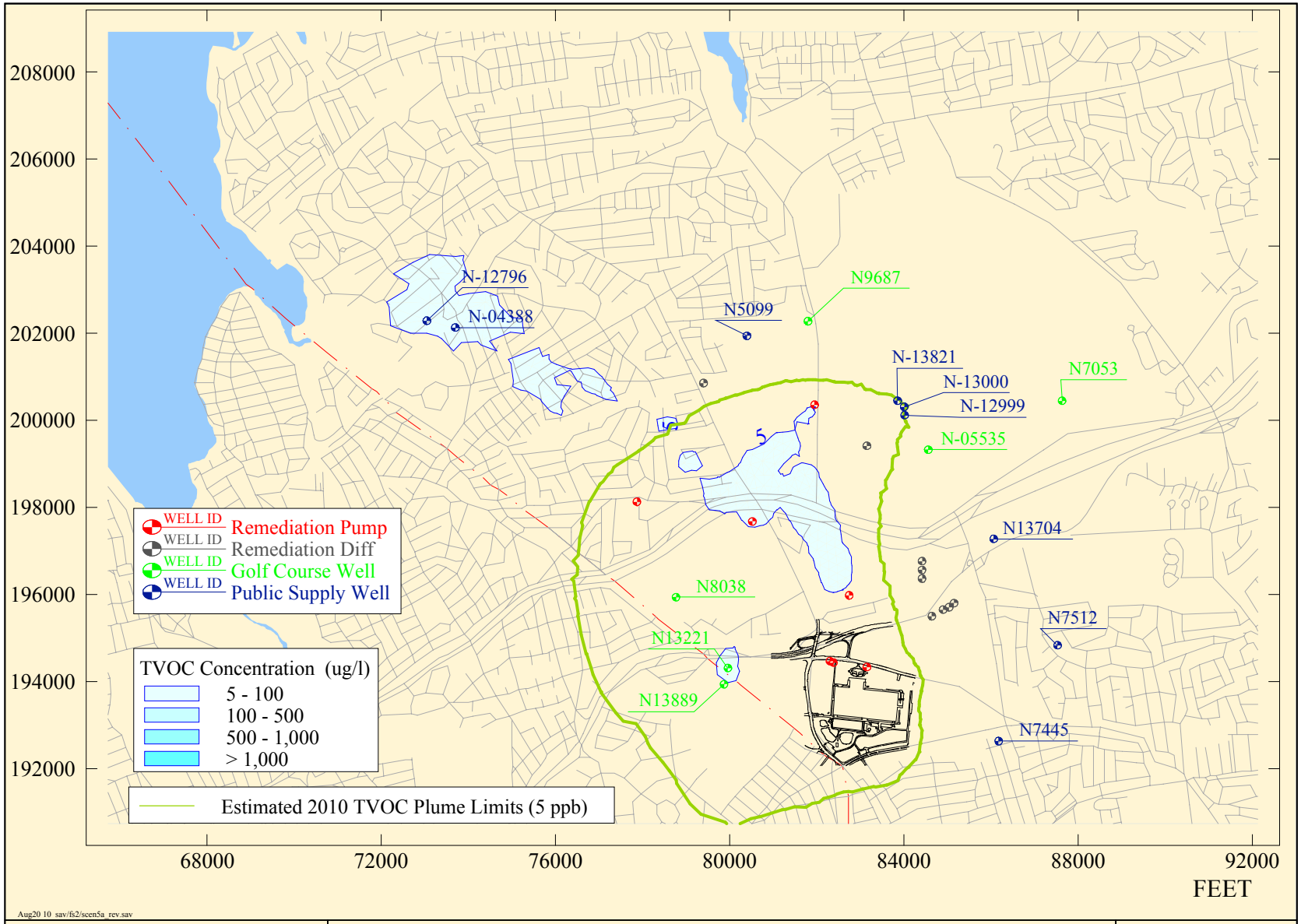


Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-34
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 4H



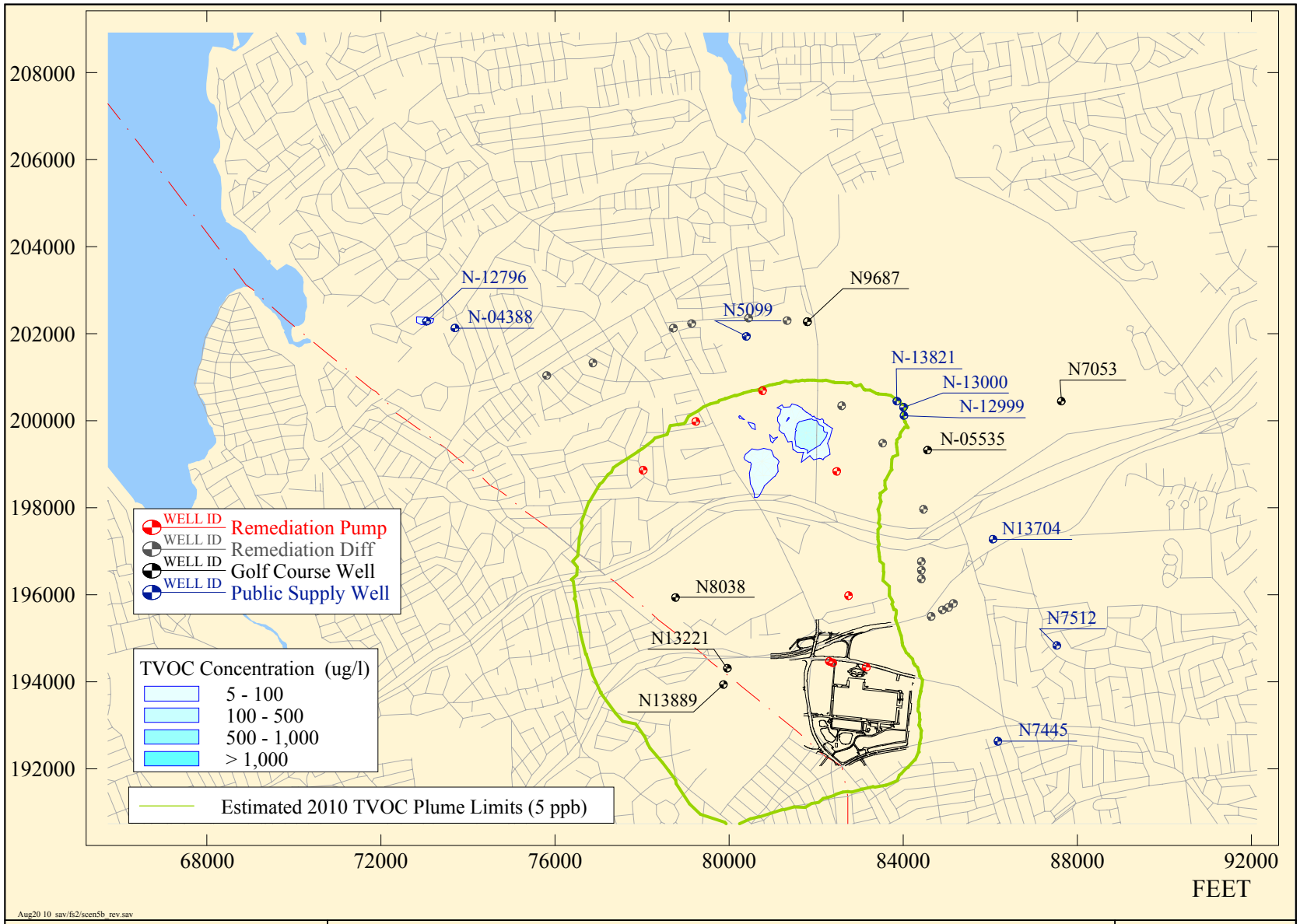
Note: The concentrations presented in the above graphs are simulated annual average concentration.



CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 5A
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

FIGURE
3-35

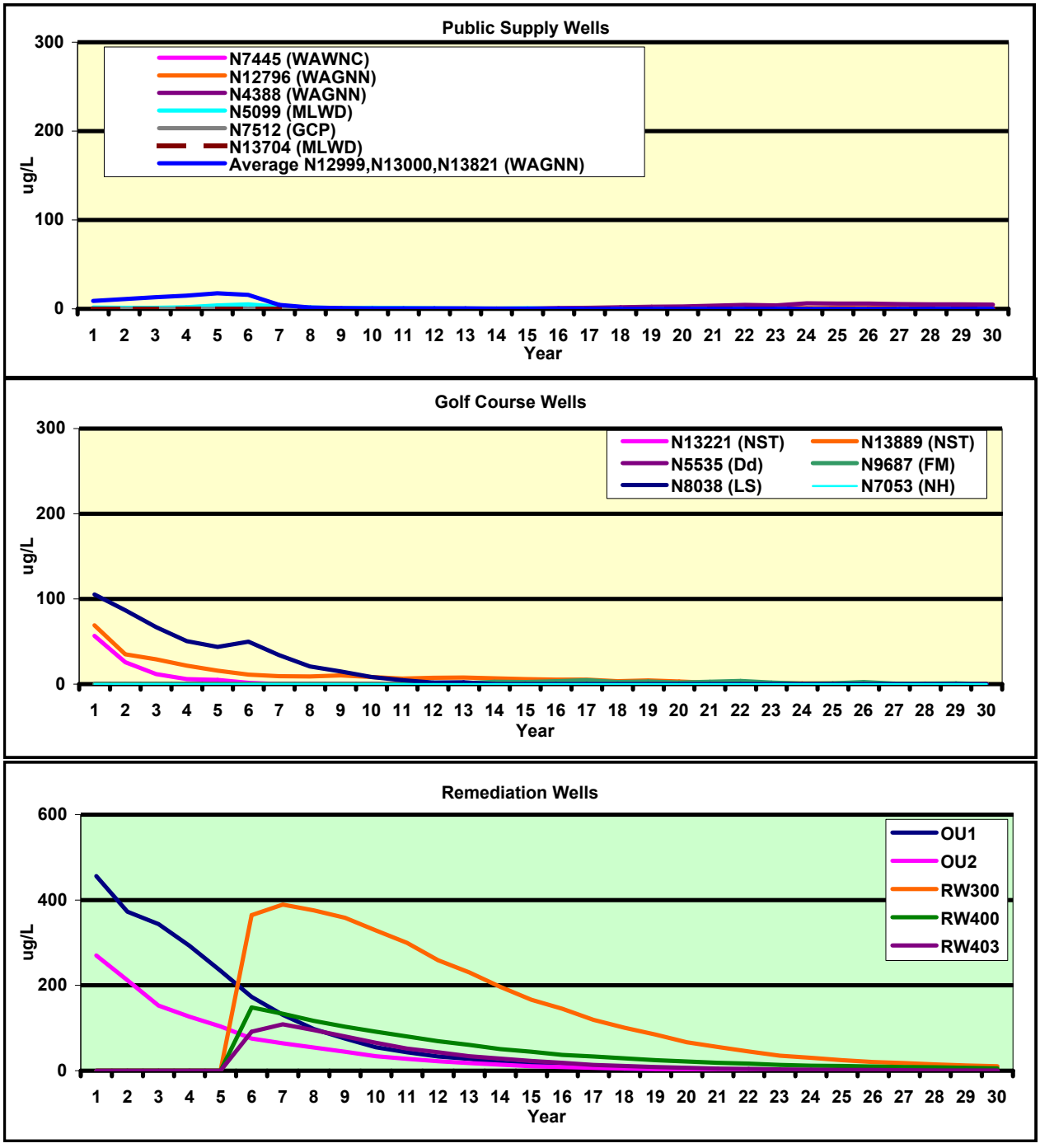


CDM Smith

Maximum Simulated TVOC Concentrations After 30 Years
Scenario 5B
Former Unisys Site, Great Neck, NY
Groundwater Model Documentation

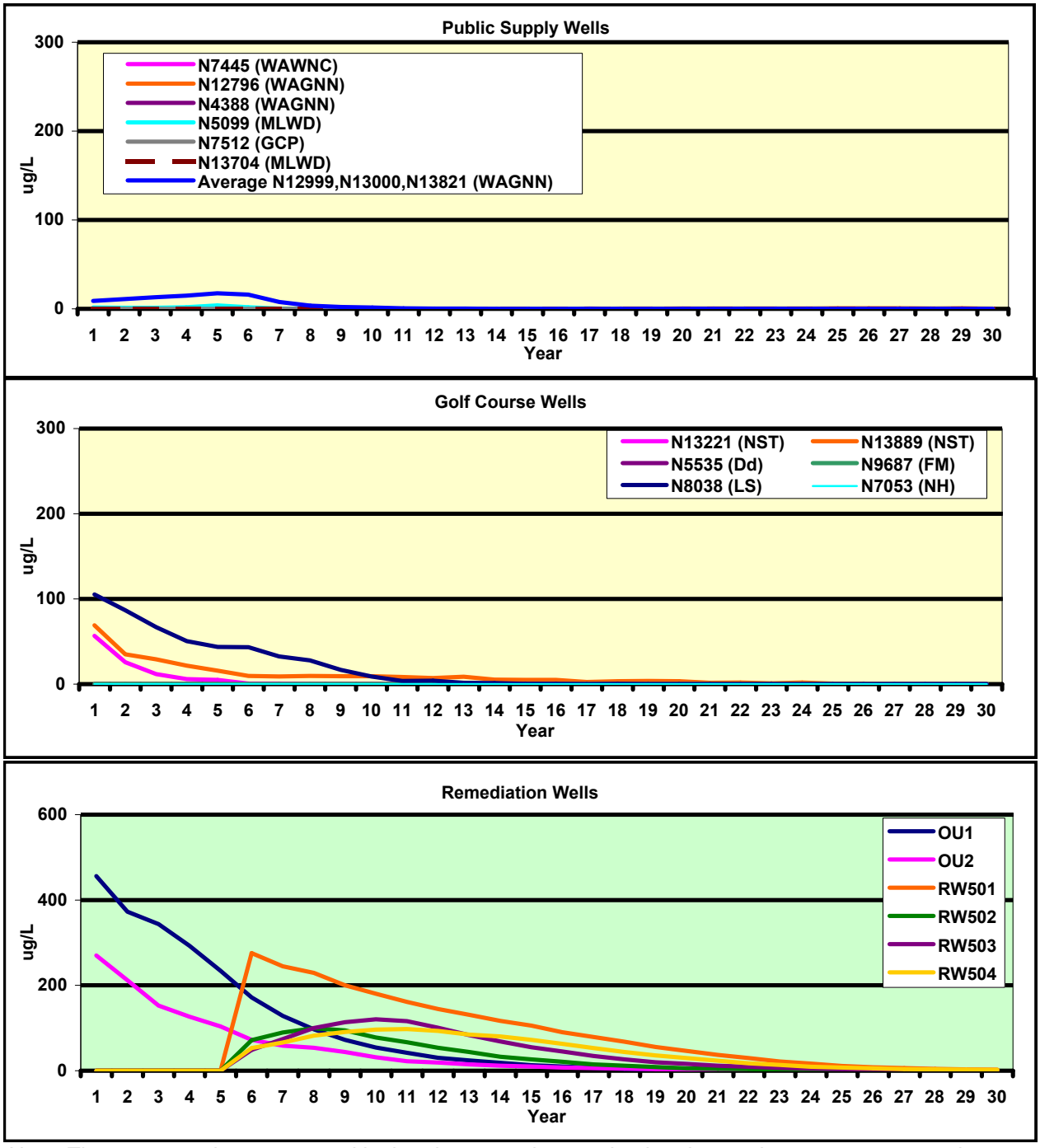
FIGURE
3-36

Figure 3-37
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 5A



Note: The concentrations presented in the above graphs are simulated annual average concentration.

Figure 3-38
Simulated TVOC Concentration Time Histories at Receptor and Remediation Wells
Scenario 5B



Note: The concentrations presented in the above graphs are simulated annual average concentration.

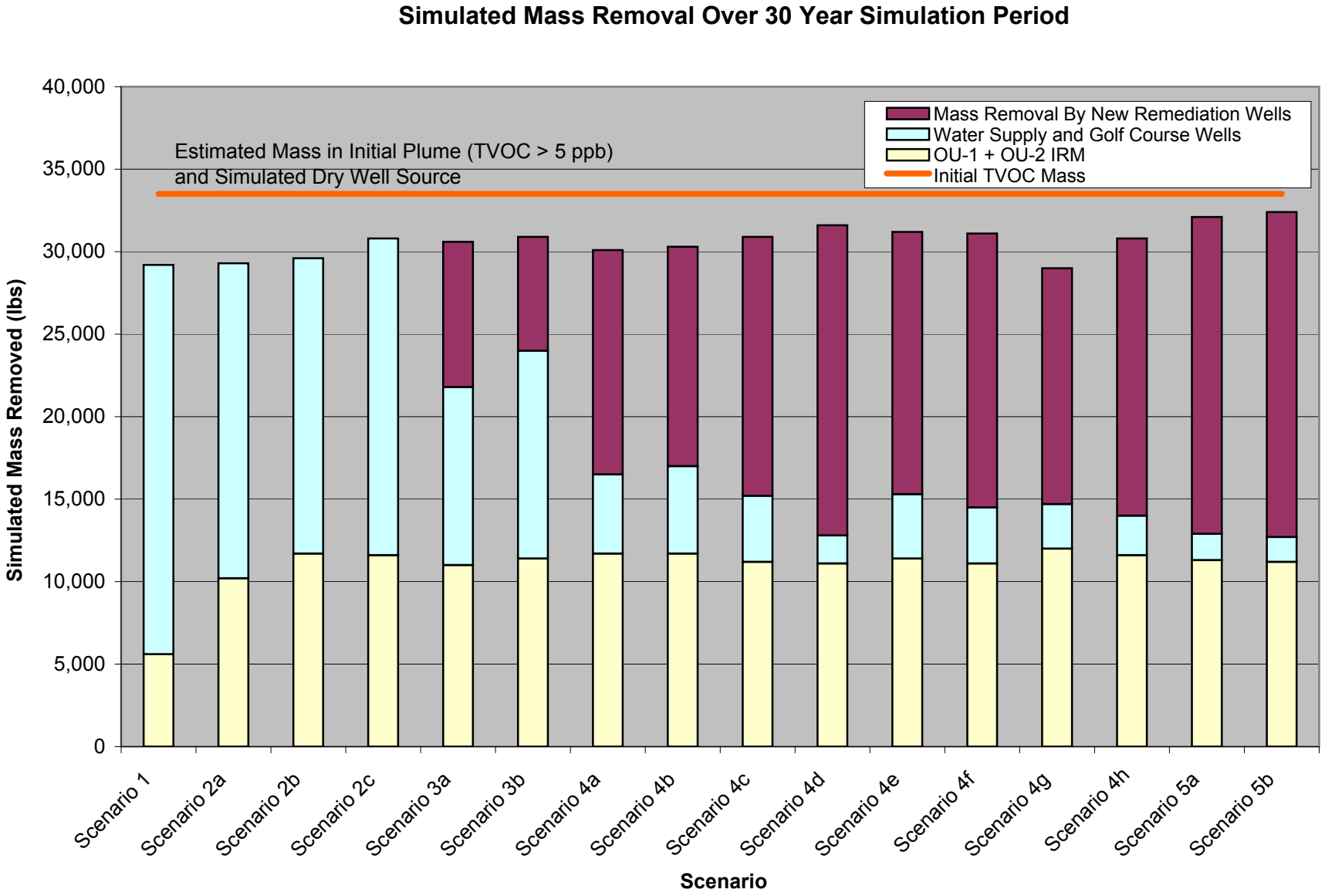


Figure 3-39
Simulated Mass Removal Over 30 Year Simulation Period
Former Unisys Site, Great Neck, NY
OU-2 Feasibility Study Groundwater Remediation Simulation Report

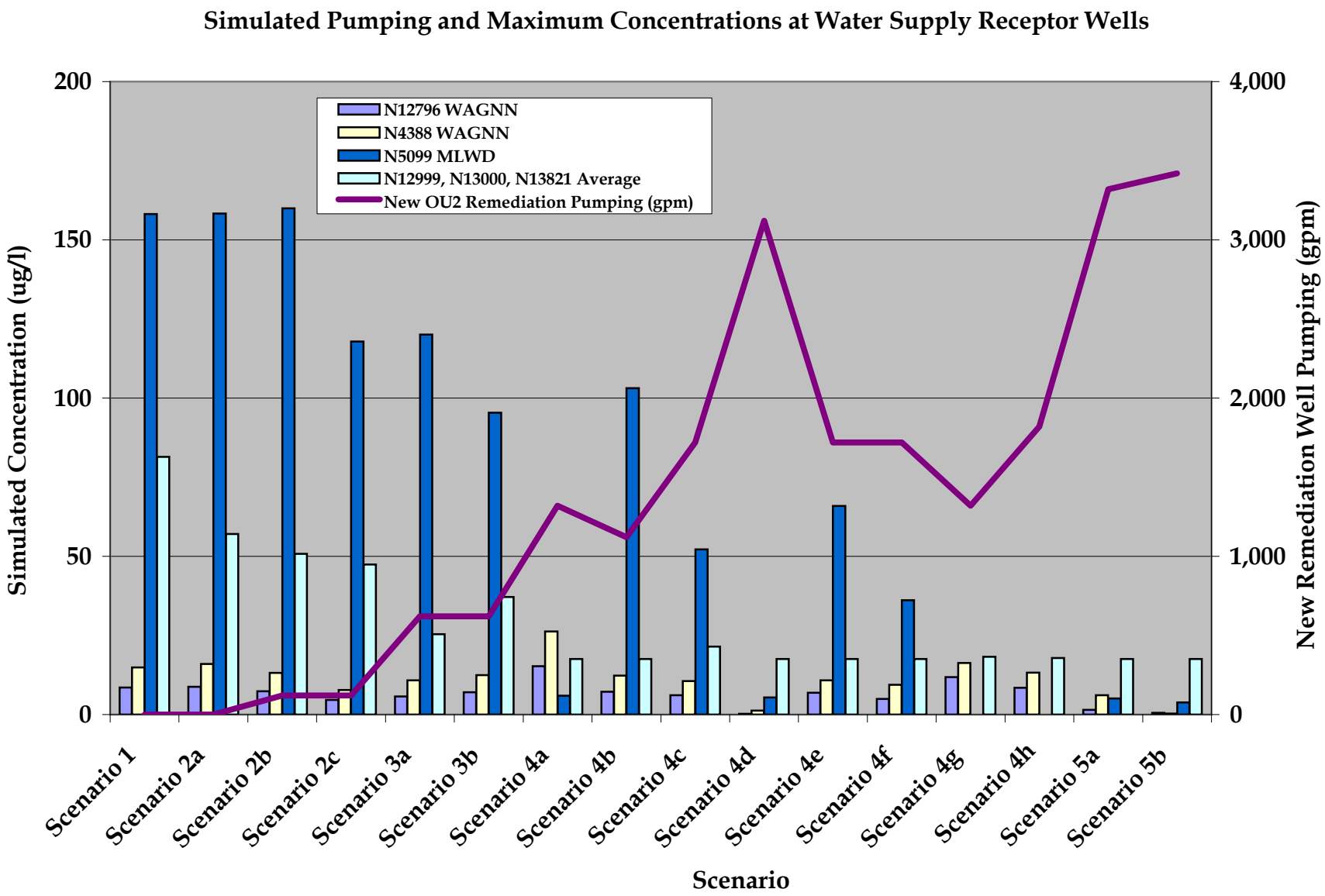


Figure 3-40
Simulated Pumping and Maximum Concentrations at Water Supply Receptor Wells
Former Unisys Site, Great Neck, NY
OU-2 Feasibility Study Groundwater Remediation Simulation Report

Appendix B— Status of Access Negotiations

APPENDIX B

STATUS OF ACCESS NEGOTIATIONS

FOR

OU-2 REMEDIAL SYSTEMS INFRASTRUCTURE

FORMER UNISYS SITE, GREAT NECK, NY

Lockheed Martin has been actively involved with community stakeholders and property owners on this project for over a decade, since the large plume of groundwater emanating from the former Unisys site was discovered. In numerous meetings and presentations, Lockheed Martin has attempted to keep the community updated on the progress of the RI and more recently on the FS. When it became clear in approximately 2008 that access would potentially be needed to private properties in order to implement an effective remedy for the groundwater plume, Lockheed Martin and ARCADIS in concert with the NYSDEC began discussing access with many of the property owners and stakeholders with which they had built relationships with over the last 10 years.

Over the past two years, Lockheed Martin has diligently focused on those properties where OU-2 remedial infrastructure would be required. These properties were selected after groundwater modeling analyses indicated which properties could potentially be required for treatment plants, pipelines and diffusion wells. This appendix section describes the contacts that Lockheed Martin and ARCADIS have made and the status of negotiations with the selected property owners. The sections below show which property owners would be affected by which RAAs, which stakeholders and property owners have been contacted, the history of the contacts, and the outcome of the discussions. Lockheed Martin has periodically kept the NYSDEC apprised of contacts and discussions with selected property owners (see attachment B-1). Copies of key pieces correspondence between Lockheed Martin and/or ARCADIS and property owners have been included as attachments B-2 through B-10.

Table B-1 lists the properties and owners potentially affected by the RAAs and Figure B-1 shows the locations of the properties and also lists what RAAs could affect each property.

FRESH MEADOW COUNTRY CLUB

Remedial Options Involved: RAA-4a, RAA-5a

Contacts:

Lockheed Martin and ARCADIS have been in frequent contact with representatives of the Fresh Meadow Country Club (FMCC) because of the importance of this property. It is one of the only locations where a large enough property exists for a large number of appropriately located and spaced diffusion wells. The following lists the formal meetings attended by all three parties:

- Presentation made on November 21, 2008 to FMCC management and counsel. During the presentation, Lockheed Martin provided an overview of the RI/FS project, progress to date, schedule, and requested that FMCC consider entering into negotiations regarding access for remedial infrastructure.
- Lockheed Martin formally requested access to the FMCC property for access for OU-2 infrastructure components in letters dated October 13, 2008 (to Brett Morris, General Manager) and November 26, 2008 letter to Roger A. Blumencrantz (see attachment B-2).
- Presentation made on April 15, 2009 to the FMCC Board of Directors. Lockheed Martin again provided an update on the RI/FS project, discussed the need for access to FMCC property for installation of a groundwater monitoring well cluster (that was requested by NYSDEC), and specifically requested access to FMCC property for installation of remedial infrastructure.
- Presentation made on April 27, 2010 to the FMCC Environmental Committee and counsel. Lockheed Martin provided for the third time an update of the RI/FS project, discussed results of monitoring well installation and sampling, and repeated its request for access to FMCC property for installation of remedial infrastructure.

In addition to the presentations listed above, Lockheed Martin and FMCC have exchanged several electronic mail messages or letters regarding access. An example of exchanged messages is provided as attachment B-3.

Status

After two years of contacts, FMCC has indicated that it will consider access for diffusion wells in its large (virtually unused) parking lot on Lakeville Road. However, it has recently indicated that it will not grant access for pipelines if the installation requires removal of trees (see electronic November 26, electronic mail message from Lee Charles to Girish Desai, attachment B-4). Based on this correspondence from FMCC, access to the FMCC property for RAA-4a and RAA-5a is not implementable.

GREAT NECK SCHOOLS

Remedial Options Involved: RAA-3a

Contacts:

No contacts have been made regarding access

Status

If RAA-3a is selected, Lockheed Martin will need to engage the Great Neck Schools in discussions regarding access for additional pipelines through school district property.

MANHASSET LAKEVILLE WATER DISTRICT

Remedial Options Involved: RAA-2c, RAA-4a, RAA-4c, RAA-4d, RAA-4g, RAA-4h, RAA-5a

Contacts:

- Presentation made on February 3, 2010 to MLWD Commissioners, counsel, superintendant, and engineering consultant. Lockheed Martin provided an overview of the RI/FS project, progress, schedule, and results of sampling conducted at nearby FMCC monitoring well.
- Lockheed Martin formally requested access to MLWD property in a February 3, 2010 letter to Paul J. Schrader, Superintendent (see attachment B-5).
- Presentation made on June 8, 2010 to MLWD Commissioners, counsel, superintendant, and engineering consultant. Provided update of RI/FS project, progress, schedule, and results of sampling conducted at nearby FMCC monitoring well. Lockheed Martin discussed remedial goals and projected (based on modeling) impacts to supply well N-5099.
- Presentation made on November 16, 2010 to MLWD Commissioners, counsel, superintendant, and engineering consultant. Lockheed Martin provided brief update of RI/FS progress and schedule and discussed potential options for supply well N-5099. Access to its property on Community Drive for remedial infrastructure was also discussed. Following the meeting, Lockheed Martin submitted a draft access agreement to MLWD for its consideration.

Status

The MLWD has verbally indicated its support for RAA-2c (assuming that is approved by the NYSDEC and NYSDOH). It has also indicated its willingness to negotiate access at both the well N5099 and Community Drive locations; however, it has verbally told both Lockheed Martin and ARCADIS (through its consultant, H2M) that it will not formally enter access negotiation until it has had the opportunity to review this draft FS submitted to the NYSDEC.

DEEPDALE GOLF CLUB

Remedial Options Involved: None. No RAAs were planned for the Deepdale Golf Club because it declined to provide access for any OU-2 infrastructure (see below).

Contacts:

Lockheed Martin requested access for OU-2 infrastructure in an October 13, 2008 letter to Scott M. Heaney, General Manager (see attachment B-6).

Status

Mr. Needham, outside counsel for Deepdale verbally declined access on behalf of the Deepdale Golf Club in an October 16, 2008 telephone call with Lockheed Martin.

VILLAGE OF LAKE SUCCESS

Remedial Options Involved: RAA-2c, RAA-3a, RAA-3b, RAA-4c, RAA-4d, RAA-4e, RAA-4h, and RAA-5a.

Contacts:

Lockheed Martin formerly requested access to VLS property in a letter dated October 13, 2008 to Mayor Ron Cooper (see Attachment B-7). Lockheed Martin also made a presentation on April 28, 2010 to VLS when it provided an overview of RI/FS project, progress, and schedule. This meeting was the culmination of several verbal discussions with VLS.

Status

The VLS has provided a letter indicating its willingness to discuss access (see attachment B-7).

MT. ZION CHURCH

Remedial Options Involved: To Be Determined

Contacts:

Lockheed Martin visited the site and made a presentation on January 21, 2009 to Ms. Rosa Du Cree, a representative of the Mt. Zion Church (see Figure B-1 and Table B-1). At the presentation Lockheed Martin provided an overview of RI/FS project, schedule, and discussed potential for access to install infrastructure.

Status

The representative of the church indicated that given the historical nature of the property, including the onsite cemetery, it was highly unlikely that the church would grant access.

VACANT PROPERTY ADJACENT TO MT. ZION CHURCH

Remedial Options Involved: To Be Determined

Contacts:

During the site visit to the Mt. Zion Church, Lockheed Martin and ARCADIS identified a vacant property adjacent to the church. A sign indicated that the property was for sale and provided a telephone number to call (see Figure 1 and Table B-1).

Status

Several attempts to reach the property owner over the past two years have failed.

KOREAN CHURCH (currently vacant property)

Remedial Options Involved: RAA-4d, RAA-4f

Contacts:

In 2008 and 2009, Lockheed Martin has made several contacts with the Korean Church's outside counsel who indicated that Lockheed Martin should review the plans for development and if it (Lockheed Martin) concluded that space was available for OU-2 infrastructure, the Korean Church would be willing to entertain access negotiations. ARCADIS duly examined the development plans at the VLS and confirmed that enough space was available for pipelines and a treatment plant.

Status

While the church has verbally indicated its willingness to enter access discussions, its plans have apparently been altered and currently has no plans to develop the site. In a meeting with the Town of North Hempstead (TONH) on April 28, 2010, the town Supervisor indicated that the TONH has tentative plans to purchase the property from the Korean Church. The Supervisor verbally indicated at the April 28, 2010 meeting that it would entertain access discussions should it purchase the property.

NORTH SHORE HEBREW ACADEMY

Remedial Options Involved: None

Contacts:

Lockheed Martin discussed access with the North Shore Hebrew Academy in 2008.

Status

The North Shore Hebrew Academy has verbally declined access. For this reason, no OU-2 infrastructure was planned for this site.

NORTH SHORE LONG ISLAND JEWISH HOSPITAL SYSTEM

Remedial Options Involved: RAA-4b, RAA-4c, RAA-4d, RAA-4e, RAA-4f, RAA-4g, RAA-4h, RAA-5a, and RAA-5b

Contacts:

Lockheed Martin has discussed access for OU-2 infrastructure on several occasions in 2008 and 2009.

Status

The North Shore Long Island Jewish Hospital System has indicated its willingness to enter access negotiations in response to a formal request for access (see attachment B-8) and has provided a letter to Lockheed Martin to that effect (see attachment B-9).

JAIN CENTER

Remedial Options Involved: RAA-4d, RAA-4f

Contacts:

Lockheed Martin discussed access with the manager of the Jain Center on January 15, 2009 (see attachment 10).

Status

Beyond the telephone call on January 15, 2009, no additional response has been received from the Jain Center.

PUBLIC AGENCIES (DEPARTMENTS OF TRANSPORTATION AND DEPARTMENTS ON PUBLIC WORKS)

Remedial Options Involved: RAA-3a, RAA-4a, RAA-4b, RAA-4c, RAA-4d, RAA-4e, RAA-4f, RAA-4g, RAA-4h, RAA-5a, and RAA-5b

Contacts:

At the NYSDEC's request, Lockheed Martin has made no contacts with public agencies (except for the TONH and VLS) to discuss access.

Status

The NYSDEC DEC has indicated that it will contact public agencies for access.

RESIDENTIAL AREA NORTH OF THE LONG ISLAND EXPRESSWAY

Remedial Options Involved: RAA-5b

Contacts:

Lockheed Martin has not made contacts in the residential area where RAA-5b would be installed.

Status

If RAA-5b were to be selected as the recommended remedy, Lockheed Martin would need to attempt to obtain access from numerous private property owners in the RAA-5b area. Based on other access negotiations in the area, access to these properties would not be implementable.

MACY'S PARKING LOT

Remedial Options Involved: RAA-4g, RAA-4h

Contacts:

As these RAAs are recent additions to the list of potential remedial scenarios, Lockheed Martin has made not contacts made regarding access.

Status

If one of the options listed above is selected as the recommended remedy, Lockheed Martin would need to contact Macy’s to discuss access.

Table B-1: Contacts for Access Negotiations

Property Address	Current Occupant		Owner's Contact Info (if different from current Occupant)	Owner's Contact Info	Owner's AlterN/Ate Address if Different from Property Address	SBL	Area in Acres	Property Card	Property Class#	Deed#	Recent Sale	Property Title	Category	Remedial Options Involved
	Name	Contact Info	Name											
255 Lakeville Rd, Great Neck, 11020	Freshmeadow Club Inc. ATTN:Lee Charles	(212)408-2505	Same	N/A	N/A	2-358-12,13	111.22	Y	553.14	3301-562	N/A	Country Clubs, Membership Golf Courses Including Those With Other Sports And Dining Facilities	Recreation And Entertainment	RAA-4A, RAA-5A
255 Lakeville Rd, Great Neck, 11020	Freshmeadow Club Inc. ATTN:Lee Charles	(212)408-2505	Same	N/A	N/A	2-358-30	N/A	Y	553.14	3301-562	N/A	Country Clubs, Membership Golf Courses Including Those With Other Sports And Dining Facilities	Recreation And Entertainment	RAA-4A, RAA-5A
345 Lakeville Road, Great Neck Union Free School District: Business Office, Great Neck, NY 11020	Great Neck Union Free School District	(516) 773-1404	Same	N/A	N/A	8-G-105	72.68	Y	612.14	No Deed	N/A	Schools - Elementary, Secondary High (Public)	Community Services	RAA-3A
Unlisted	Mahasset-Lakeville Water District	(516)466-4416	Same	N/A	170 East Shore Road, Great Neck, NY 11023	2-358-16,17	N/A	Y	652.14	No Deed	N/A	U.S.Goverment	Community Services	RAA-2C, RAA-4A, RAA-4C, RAA-4D, RAA-4G, RAA-4H, RAA-5A
300 N North Service Rd, Manhasset, 11030	Deepdale Golf Club.	(516)627-7880	Same	N/A	N/A	3-E-486	126.76	Y	553.14	6133-072	N/A	Country Clubs, Membership Golf Courses Including Those With Other Sports And Dining Facilities	Recreation And Entertainment	none
I U Willets Rd, Great Neck, 11020	Incorporated Village of Lake Success	N/A	Same	N/A	N/A	2-273-38	8.6721	Y	652.94	No Deed	N/A	Community Services	Villages	RAA-3A, RAA-3B, RAA-4C, RAA-4D, RAA-4E, RAA-4H, RAA5A
467 Community Dr, Manhasset, NY 11030	Lakeville AME Zion Church	(516) 627-2061	Same	N/A	N/A	2-358-24,18	0.6461	Y	620.14	No Deed	N/A	Religious	Community Services	to be determined
483 Community Dr, Manhasset, NY 11030		Vacant Land				2-358-21	N/A	Y	311.11	11905519	01/13/2005 12/15/1998	N/A	N/A	to be determined
69 No Service Rd, Great Neck, 11020		Vacant Land				2-358-27	N/A	Y	330.14	D10215-381	N/A	Commercial	Vacant Land	RAA-4D, RAA-4F
Community Rd, Great Neck, 11021	North Shore Hebrew Academy ATTN: Tom Moran	(516) 487-2520	Nassau County Industrial Development Agency & Wachovia Bank N/AtioN/Al Association	(516) 571-4160	1100 Franklin Avenue, Suite 300, Garden City, NY-11530	2-358-37	11.066	Y	620.14	12061244	N/A	Religious	Community Services	none
Lkeville Rd, Great Neck, NY 11020	Jain Center of America	(718)478-9141	Same	N/A	43-11 Ithaca St, Elmhurst, NY 11373	2-358-29	N/A	Y	311.11	11042774	3/11/1999	N/A	N/A	RAA-4D, RAA-4F
600 Community Dr, Manhasset, 11030	Donald Pazour; CEO of Mfw Acquisition Holdings	(516) 562-5000	Delware Limited Liability Company;	N/A	N/A	3-E-185	8.93	Y	464.14	12110436	6/30/2005	Office Building	Commercial	RAA-4B, RAA-4C, RAA-4D, RAA-4E, RAA-4F, RAA-4G, RAA-4H, RAA-5A, RAA-5B
	North Shore LI DJ Health Systems	(516)627-1820	Delware Limited Liability Company	N/A	N/A	3-E-487				12110436				
	The Institute for Community Development	(516) 562-5440	Delware Limited Liability Company	N/A	N/A	3-E-488				12110436				
300 Community Drive, Manhasset, NY 11030	North Shore University Hospital	(516) 465-8900	Nassau County Industrial Development Agency	516-571-4160	1100 Franklin Avenue - Suite 300, Garden City, NY 11530	3-E-1108	N/A	Y	641.04	9163-079	N/A	Hospitals	Community Services	
	North Shore University Hospital	(516) 465-8900	The Manhasset Park District	(516) 627-7711	62 Manhasset Ave, Manhasset, NY	3-E-192	11.84	Y	437.12	9399-873	N/A	Paking Garage	Commercial	
1100 Northern Blvd, Manhasset, 11030	Macy's Shopping Center	(516) 869-8500		N/A	N/A	3-E-1050	21.69	Y	453.14	7212-542	N/A	Department Store	Commercial	RAA-4G, RAA-4H
Public Agencies: Being Handled By DEC														
Residential Area North of LIE														
1 Woods Rd, Great Neck, 11020						2-28205-146	0.4207	Y	210.01	10146095	N/A	One Family Year-Round Residence	Residential	RAA-5B
40 Meadow Woods Rd, Lake Success						2-28205-147	0.3719	Y	210.01	10881852	N/A	One Family Year-Round Residence	Residential	RAA-5B
35 Meadow Woods Rd, Lake Success						2-28203-143	0.287	Y	210.01	11395669	10/11/2001	One Family Year-Round Residence	Residential	RAA-5B
33 Meadow Woods Rd, Lake Success						2-28203-144	0.3115	Y	210.01	11960431	5/16/2005	One Family Year-Round Residence	Residential	RAA-5B
31 Meadow Woods Rd, Lake Success						2-28203-44	0.2955	Y	210.01	11907754	1/18/2005	One Family Year-Round Residence	Residential	RAA-5B
2 West Woods Rd, Great Neck, 11020						2-28204-21	0.3195	Y	210.01	9884-668	N/A	One Family Year-Round Residence	Residential	RAA-5B
30 Meadow Woods Rd, Lake Success						2-28204-43	0.3359	Y	210.01	11002528	N/A	One Family Year-Round Residence	Residential	RAA-5B
17 Fox Hunt Ln, Great Neck, 11020						2-281-37	0.236	Y	210.01	9912-831	N/A	One Family Year-Round Residence	Residential	RAA-5B
19 Fox Hunt Ln, Great Neck, 11020						2-341-38	0.3444	Y	210.01	11491055	7/29/2008; 06/14/2002	One Family Year-Round Residence	Residential	RAA-5B
18 Fox Hunt Ln, Great Neck, 11020						2-28204-42	0.3444	Y	210.01	7512-074	N/A	One Family Year-Round Residence	Residential	RAA-5B
21 Fox Hunt Ln, Great Neck, 11020						2-341-39	0.287	Y	210.01	10858603	12/9/1997	One Family Year-Round Residence	Residential	RAA-5B
20 Fox Hunt Ln, Great Neck, 11020						2-28201-41	0.3416	Y	210.01	12224442	1/16/2007	One Family Year-Round Residence	Residential	RAA-5B

Table B-1: Contacts for Access Negotiations

Property Address	Current Occupant		Owner's Contact Info (if different from current Occupant)	Owner's Contact Info	Owner's AlterN/Ate Address if Different from Property Address	SBL	Area in Acres	Property Card	Property Class#	Deed#	Recent Sale	Property Title	Category	Remedial Options Involved
	Name	Contact Info	Name											
23 Fox Hunt Ln, Great Neck, 11020						2-341-627	0.3145	N	210.01	12267952	5/8/2007	One Family Year-Round Residence	Residential	RAA-5B
16 Links Dr, Great Neck, 11020						2-344-1	0.47	Y	210.01	12091891	2/22/2006	One Family Year-Round Residence	Residential	RAA-5B
75 Horace Harding Blvd, Great Neck, 11020						2-344-2	0.5601	Y	210.01	9265-113	N/A	One Family Year-Round Residence	Residential	RAA-5B
71 Horace Harding Blvd, Great Neck, 11020						2-344-3	0.4435	Y	210.01	11777894	04/15/2004; 11/18/1994	One Family Year-Round Residence	Residential	RAA-5B
2 Links Dr, Great Neck, 11020						2-344-4	0.6171	Y	210.01	15190859	08/13/2010; 07/19/2002	One Family Year-Round Residence	Residential	RAA-5B
1 Links Dr, Great Neck, 11020						2-345-7	0.6107	Y	210.01	12237061	1/4/2007	One Family Year-Round Residence	Residential	RAA-5B
3 Fairway Dr, Great Neck, 11020						2-345-8	0.5096	Y	210.01	10941647	07/28/1998; 02/12/1993	One Family Year-Round Residence	Residential	RAA-5B
88 Horace Harding Blvd, Great Neck 11020						2-341-626	0.2729	N	210.01	12248437	3/15/2007	One Family Year-Round Residence	Residential	RAA-5B
36 Old Field Ln, Great Neck, 11020						2-341-123	0.4218	Y	210.01	10884720	6/25/2010	One Family Year-Round Residence	Residential	RAA-5B
38 Old Field Ln, Great Neck, 11020						2-341-122	0.3247	Y	210.01	12310814	8/24/2007	One Family Year-Round Residence	Residential	RAA-5B
40 Old Field Ln, Great Neck, 11020						2-341-321, 18	0.2767	Y	210.01	9646-356	N/A	One Family Year-Round Residence	Residential	RAA-5B
42 Old Field Ln, Great Neck, 11020						2-341-17	0.2984	Y	210.01	9000-204	N/A	One Family Year-Round Residence	Residential	RAA-5B
44Old Field Ln, Great Neck, 11020						2-341-16	0.3099	Y	210.01	11860504	N/A	One Family Year-Round Residence	Residential	RAA-5B
46 Old Field Ln, Great Neck, 11020						2-341-15	0.3214	Y	210.01	12409460	N/A	One Family Year-Round Residence	Residential	RAA-5B
48 Old Field Ln, Great Neck, 11020						2-341-14	0.3329	Y	210.01	11419849	10/22/2001; 10/11/2000	One Family Year-Round Residence	Residential	RAA-5B
50 Old Field Ln, Great Neck, 11020						2-341-13	0.3329	Y	210.01	10041820	N/A	One Family Year-Round Residence	Residential	RAA-5B
52 Old Field Ln, Great Neck, 11020						2-341-12	0.3421	Y	210.01	12106640	9/27/2002	One Family Year-Round Residence	Residential	RAA-5B
54 Old Field Ln, Great Neck, 11020						2-341-11	0.3444	Y	210.01	11777836	4/21/2004	One Family Year-Round Residence	Residential	RAA-5B
2 Birch Hill Rd, Great Neck, 11020						2-28002-101	0.379	Y	210.01	9058-508	N/A	One Family Year-Round Residence	Residential	RAA-5B
4 Birch Hill Rd, Great Neck, 11020						2-28002-102	0.3169	Y	210.01	11061450	5/11/1999	One Family Year-Round Residence	Residential	RAA-5B
6 Birch Hill Rd, Great Neck, 11020						2-28002-103	0.3144	Y	210.01	10198765	N/A	One Family Year-Round Residence	Residential	RAA-5B
8 Birch Hill Rd, Great Neck, 11020						2-28002-104	0.312	Y	210.01	10755563	2/20/1997	One Family Year-Round Residence	Residential	RAA-5B
10 Birch Hill Rd, Great Neck, 11020						2-28002-105	0.3095	Y	210.01	11297965	N/A	One Family Year-Round Residence	Residential	RAA-5B
12 Birch Hill Rd, Great Neck, 11020						2-28002-106	0.3095	Y	210.01	12335184	09/10/2010; 10/01/2007	One Family Year-Round Residence	Residential	RAA-5B
88 Pine Hill Rd, Great Neck, 11020						2-328-7	0.303	Y	210.01	10966445	N/A	One Family Year-Round Residence	Residential	RAA-5B
96 Pine Hill Rd, Great Neck, 11020						2-328-6	0.303	Y	210.01	10814179	8/19/1997	One Family Year-Round Residence	Residential	RAA-5B
110 Pine Hill Rd, Great Neck, 11020						2-328-5	0.303	Y	210.01	8653-115	N/A	One Family Year-Round Residence	Residential	RAA-5B
122 Pine Hill Rd, Great Neck, 11020						2-328-4	0.3223	Y	210.01	9490-398	N/A	One Family Year-Round Residence	Residential	RAA-5B
1 Pine Hill Rd, Great Neck, 11020						2-329-18	0.2956	Y	210.01	10640299	N/A	One Family Year-Round Residence	Residential	RAA-5B
26 Rivers Dr, Great Neck, 11020						2-325-5	0.2231	Y	210.01	12398973	N/A	One Family Year-Round Residence	Residential	RAA-5B
24 Rivers Dr, Great Neck, 11024						2-325-4	0.2443	Y	210.01	8395-052	N/A	One Family Year-Round Residence	Residential	RAA-5B
22 Rivers Dr, Great Neck, 11020						2-325-3	0.2443	Y	210.01	12500422	4/29/2009	One Family Year-Round Residence	Residential	RAA-5B
20 River Dr, Great Neck, 11020						2-325-2	0.2443	Y	210.01	11835526	8/19/2004	One Family Year-Round Residence	Residential	RAA-5B
18 Rivers Dr, Great Neck, 11020						2-325-1	0.2574	Y	210.01	12533432	5/21/2009	One Family Year-Round Residence	Residential	RAA-5B
16 Rivers Dr, Great Neck, 11020						2-319-12	0.2443	Y	210.01	11681458	9/2/2003	One Family Year-Round Residence	Residential	RAA-5B
14 Rivers Dr, Great Neck, 11020						2-319-11	0.2443	Y	210.01	9579-613	N/A	One Family Year-Round Residence	Residential	RAA-5B

Table B-1: Contacts for Access Negotiations

Property Address	Current Occupant		Owner's Contact Info (if different from current Occupant)	Owner's Contact Info	Owner's AlterN/Ate Address if Different from Property Address	SBL	Area in Acres	Property Card	Property Class#	Deed#	Recent Sale	Property Title	Category	Remedial Options Involved
	Name	Contact Info	Name											
12 Rivers Dr, Lake Success, 11042						2-319-10	0.2443	Y	210.01	7551-360	N/A	One Family Year-Round Residence	Residential	RAA-5B
10 Rivers Dr, Great Neck, 11020						2-319-9	0.2443	Y	210.01	11786229	5/4/2004	One Family Year-Round Residence	Residential	RAA-5B
8 Rivers Dr, New Hyde Park, 11040						2-319-8	0.2443	Y	210.01	10875080	1/21/1998	One Family Year-Round Residence	Residential	RAA-5B
6 Rivers Dr, Great Neck, 11020						2-319-7	0.2443	Y	210.01	12529012	08/06/2009; 12/09/2004; 06/16/2004	One Family Year-Round Residence	Residential	RAA-5B
4 Rivers Dr, Great Neck, 11020						2-319-6	0.2534	Y	210.01	10884967	02/03/1998; 07/13/1993	One Family Year-Round Residence	Residential	RAA-5B
2 Rivers Dr, Great Neck, 11020						2-319-5	0.3969	Y	210.01	12518646	10/2/2001	One Family Year-Round Residence	Residential	RAA-5B
11 Bowers Ln, Great Neck, 11021						2-319-13	0.4325	Y	210.01	9804-705	N/A	One Family Year-Round Residence	Residential	RAA-5B
9 Bowers Ln, Great Neck, 11020						2-319-2	0.2525	Y	210.01	12263439	11/30/2009; 06/23/2004; 12/11/1997; 07/16/1996	One Family Year-Round Residence	Residential	RAA-5B
7 Bowers Ln, Great Neck, 11020						2-319-1	0.2525	Y	210.01	11644713	4/3/2003	One Family Year-Round Residence	Residential	RAA-5B
26 Somerset Dr, Great Neck, 11020						2-085-11	0.202	Y	210.01	11674216	08/28/2003; 07/28/1994	One Family Year-Round Residence	Residential	RAA-5B
21 Somerset Dr, Great Neck, 11020						2-090-329	0.2875	Y	210.01	11787538	04/28/2004; 08/22/1996	One Family Year-Round Residence	Residential	RAA-5B
19 Merrivale Rd, Great Neck, 11020						2-090-327	0.2944	Y	210.01	10923627	6/17/1998	One Family Year-Round Residence	Residential	RAA-5B
21 Merrivale Rd, Great Neck, 11021						2-090-330	0.3058	Y	210.01	10832896	9/26/1997	One Family Year-Round Residence	Residential	RAA-5B
Merrivale Rd, Great Neck, 11021						2-090-333	0.2342	Y	210.01	8552-150	N/A	One Family Year-Round Residence	Residential	RAA-5B
25 Merrivale Rd, Great Neck, 11021						2-090-332	0.2672	Y	210.01	12262900	4/22/1993	One Family Year-Round Residence	Residential	RAA-5B
28 Merrivale Rd, Great Neck, 11021						2-092-3	0.4518	Y	210.01	12463329	N/A	One Family Year-Round Residence	Residential	RAA-5B
26 A Merrivale Rd, Great Neck, 11020						2-092-211	0.2149	Y	210.01	11716608	12/8/2003	One Family Year-Round Residence	Residential	RAA-5B
1 Dorset Rd, Great Neck, 11020						2-092-212	0.2479	Y	210.01	12171924	08/18/2006; 11/19/2001	One Family Year-Round Residence	Residential	RAA-5B
26 Merrivale Rd, Great Neck, 11021						2-091-15	0.247	N	210.01	12514307	06/03/2009; 12/19/2005	One Family Year-Round Residence	Residential	RAA-5B
24 Merrivale Rd, Great Neck, 11021						2-091-14	0.2356	N	210.01	12521726	07/01/2009; 12/19/2005	One Family Year-Round Residence	Residential	RAA-5B
22 Merrivale Rd, Great Neck, 11020						2-091-1	0.4435	Y	210.01	11835354	8/5/2004	One Family Year-Round Residence	Residential	RAA-5B
20 Merrivale Rd, Great Neck, 11020						2-084-1	0.2273	Y	210.01	10431360	5/18/1994	One Family Year-Round Residence	Residential	RAA-5B
48 Somerset Dr, Great Neck, 11020						2-084-10	0.2273	Y	210.01	5598-460	3/24/2010	One Family Year-Round Residence	Residential	RAA-5B
3 Hereford Rd, Great Neck, 11020						2-095-13	0.2176	Y	210.01	8114-484	N/A	One Family Year-Round Residence	Residential	RAA-5B
4 Hereford Rd, Great Neck, 11020						2-097-1	0.5196	Y	210.01	12353168	N/A	One Family Year-Round Residence	Residential	RAA-5B
85 Somerset Dr, Great Neck, 11020						2-104-102	0.2204	Y	210.01	10661211	6/5/1996	One Family Year-Round Residence	Residential	RAA-5B

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
\\NY1FP1\Data\ENVCAD\Melville-NY\ACTIFS Scenario\Data Map\Property DATA IN 2.dwg LAYOUT: B-1 SAVED: 12/30/2010 7:47 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 5/30/2012 6:39 PM BY: SANCHEZ, ADRIAN
PROJECTNAME: ----
XREFS:
Xref_2.5mile
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LEGEND:

2-34-13 ● SECTION, BLOCK AND LOT NUMBER

NOTE:

NOT ALL POTENTIALLY AFFECTED PARCELS NECESSARILY SHOWN

0 500' 1000'
SCALE IN FEET

LOCKHEED MARTIN CORPORATION
FORMER UNISYS FACILITY
FEASIBILITY STUDY

POTENTIALLY AFFECTED PARCELS

ARCADIS

FIGURE
B-1

Appendix C— Cost Model

Appendix C
Remedial Action Alternatives Cost Estimate Summary
Feasibility Study, Operable Unit 2
Lockheed Martin Corporation, Great Neck, New York

Alternative	Capital	Operation and Maintenance	Total
	30-Year Net Present Value Cost		
RAA-1	$ 5,100,000	$ 3,500,000	$ 8,600,000
RAA-2a	$ 8,600,000	$ 23,000,000	$ 32,000,000
RAA-2b	$ 9,800,000	$ 28,000,000	$ 38,000,000
RAA-2c	$ 14,000,000	$ 25,000,000	$ 39,000,000
RAA-3a	$ 14,000,000	$ 28,000,000	$ 42,000,000
RAA-3b	$ 20,000,000	$ 35,000,000	$ 55,000,000
RAA-4a	$ 23,000,000	$ 42,000,000	$ 65,000,000
RAA-4b	$ 23,000,000	$ 38,000,000	$ 61,000,000
RAA-4c	$ 27,000,000	$ 42,000,000	$ 69,000,000
RAA-4d	$ 35,000,000	$ 54,000,000	$ 89,000,000
RAA-4e	$ 31,000,000	$ 49,000,000	$ 80,000,000
RAA-4f	$ 23,000,000	$ 41,000,000	$ 64,000,000
RAA-4g	$ 22,000,000	$ 44,000,000	$ 66,000,000
RAA-4h	$ 35,000,000	$ 56,000,000	$ 91,000,000
RAA-5a	$ 42,000,000	$ 60,000,000	$ 102,000,000
RAA-5b	$ 34,000,000	$ 63,000,000	$ 97,000,000

Note:
Costs are escalated at 3.5% and discounted at 8%.

Table C-A. Variables
Former Unisys Facility, Great Neck, New York
Lockheed Martin Corporation

Escalation Rate:	**3.5%**	
Discount Rate:	**8.0%**	
Full Sampling Frequency:	**3**	Years
Number of wells monitored in years 1 and 2:	**35**	Wells
Number of wells monitored in years 3 - 30:	**45**	Wells
Number of wells monitored during OU-2 event:	**135**	Wells
Frequency of OU-2 monitoring event:	**3**	Years
Standard monitoring event:	**2**	Weeks
OU-2 Monitoring Event:	**5**	Weeks
EPA 8260 Analysis:	**$120**	
Gloves:	**$20**	per box
PPE:	**$50**	per week
Tubing:	**$2.50**	per foot
Bladders:	**$10**	each
PDBs:	**$18**	each
PDB Harnesses:	**$50**	each
Initial Event Supplies:	**$100**	per week
Non-Initial Event Supplies:	**$150**	per week
Engineering Percentage of Capital Cost:	**5%**	
Construction Management Percentage of Capital Cost	**7%**	
Project Management Percentage of Capital Cost	**10%**	
Construction Contingency (Union Labor)	**15%**	
New York State Tax	**8.625%**	
Total Capital Adder	**45.625%**	
Mechanical Installation Percentage of Capital Cost	**100%**	
Electrical Installation Percentage of Capital Cost	**25%**	
Treatment System Access Fee	**$100,000**	per treatment system
Treatment System Building Cost	**$250**	per square feet
Well Access Fee	**$50,000**	per EW & DW pair
Well Permitting Fee	**$20,000**	per well
Capital Improvement Factor	**5%**	percent of capital
Capital Improvement Frequency	**5**	years
Treatment System Capital Improvement Fee	**$300,000**	per treatment system
O&M Efficiency Reduction Percentage	**2%**	per year
Wellhead O&M Efficiency Reduction Percentage	**1%**	per year
Electricity Cost	**$0.13**	per kW-hour
N5099 Flow Rate	**1,000**	GPM
N5099 Flow Rate_Remedial	**1,200**	GPM
N12796 and N4388 Flow Rate	**2,000**	GPM
Blower Efficiency	**80%**	
Air:Water Ratio	**50**	
Air Stripper Blower Pressure	**0.8**	psig
Pump Efficiency	**75%**	
Motor Efficiency	**90%**	
N5099 System Pressure	**0**	psig
N5099 System Pressure_Remedial	**75**	psig
N12796 and N4388 System Pressure	**0**	psig

Table C-B. OU-2 Monitoring Well Installation Cost
Former Unisys Facility, Great Neck, New York
Lockheed Martin Corporation

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)					
Mobilization/Demobilization, Well Development, Waste Handling	4	ea	$ 75,000	$ 300,000	
Drilling	2,400	lf	$ 130	$ 312,000	Basis: 2008 Well Cluster Installation Costs, adjusted to 2010
Vertical Profile Boring	4	ea	$ 100,000	$ 400,000	
Installation	2,400	lf	$ 70	$ 168,000	Basis: 2008 Well Cluster Installation Costs, adjusted to 2010
Drilling Field Oversight	1,440	hr	$ 100	$ 144,000	6 weeks per well x 60 hours per week
PM/Well Access	1	ls	$ 363,000	$ 363,000	6% plus 60 hours PM/TM time per well for access negotation
Well Permitting Fee	4	ea	$ 20,000	$ 80,000	
Well Access Fee	4	ea	$ 50,000	$ 200,000	
Subtotal				**$ 2,000,000**	Revised per CDM's 8/18/2010 comments (W. Glynn)

Table C-C. OU-2 Groundwater Monitoring Cost Estimate
Former Unisys Facility, Great Neck, New York
Lockheed Martin Corporation

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Initial Groundwater Monitoring Events					
Years 1 and 2 Sampling Events					
Field Sampling					
Sample 35 wells (low flow).	1	ls	$ 17,200	$ 17,200	2 weeks of field labor (2 man crew, $150/hour) + PM oversight (1 hr per day)
Analytical - EPA 8260B (per sample)	59	ea	$ 120	$ 7,080	10 trip blanks and equipment blanks, 4 dups
Gloves (per box)	2	wk	$ 20	$ 40	
PPE	2	wk	$ 50	$ 100	
Tubing (per foot)	3,000	ft	$ 2.50	$ 7,500	Assume 25% of tubing needs to be replaced per year, avg. 250' wells; Tubing for new wells is included in above installation cost
Bladders	35	ea	$ 10	$ 350	Assume 100% replacement per year
Misc. Sampling supplies (per week)	2	wk	$ 100	$ 200	
Reporting					
Write, Review, Publish Report	1	ea	$ 8,000	$ 8,000	40 hours - staff engineer, 8 hours - project manager, 8 hours CAD, 4 hours WP, 2 hours for Expert
TOTAL INITIAL ANNUAL MONITORING COST				**$ 41,000**	
Groundwater Monitoring					
Field Sampling					
Years 3 through 30 (45 wells)					Excluding Full OU-2 Monitoring Event Years.
Sample 45 wells (PDBs)	1	ls	$ 17,200	$ 17,200	Assume equal cost; 25% reduction in labor effort is offset by 30% increase in wells to be sampled
Purchase PDBs (bags)	50	ea	$ 18	$ 900	10% additional
Analytical - EPA 8260B	60	ea	$ 120	$ 7,200	10 trip blanks, 5 dups
				$ -	
Gloves (per box)	2	wk	$ 20	$ 40	
PPE	2	wk	$ 50	$ 100	
Misc. Sampling supplies (per week)	2	wk	$ 150	$ 300	
Reporting					
Write, Review, Publish Report	1	ea	$ 10,000	$ 10,000	40 hours - staff engineer, 8 hours - project manager, 8 hours CAD, 4 hours WP, 2 hours for Expert
TOTAL ANNUAL MONITORING COST				**$ 36,000**	
Field Monitoring					
Years 3 through 30, Full OU-2 Event (135 wells)					Every three years starting in year 3.
Sample 135 wells (PDBs)	1	ls	$ 51,400	$ 51,400	
Purchase PDBs (bags)	135	ea	$ 18	$ 2,430	10% additional
Purchase PDBs (harness)	135	ea	$ 50	$ 6,750	Years 3, 9, 15, 21, 27 (Annualized Over 10 years)
Analytical - EPA 8260B	179	ea	$ 120	$ 21,480	27 trip blanks, 14 dups
Gloves (per box)	5	wk	$ 20	$ 100	
PPE	5	wk	$ 50	$ 250	
Misc. Sampling supplies (per week)	5	wk	$ 150	$ 750	
Reporting					
Write, Review, Publish Report	1	ea	$ 12,000	$ 12,000	60 hours - staff engineer, 12 hours - project manager, 12 hours CAD, 8 hours WP
TOTAL OU-2 ANNUAL MONITORING COST				**$ 96,000**	

Table C-D. Cost Estimate for Wellhead Treatment at Purveyor Wells N12796 & N4388

Basis of estimate:
- *2,000 gpm water flow*
- *Water treatment system is already in place - just need off-gas treatment (PPZ + VPGAC)*
- *No upgrades to electrical service required - just MCCs and PLC upgrades for new components*
- *Existing treatment building can be utilized for electrical controls*

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install Air Strippers for 2,000-gpm Plant					
1. General Site Prep.	1	ea	$ 60,000	$ 60,000	Clearing and grading (200' x 400' area), mobilization and foundation preparation
2. Treatment Building					
Concrete Work	1	ea	$ 100,000	$ 100,000	
Soil transport.	1,500	cy	$ 7	$ 10,500	200' x 400' x 2' deep
Final Grading, Fencing, and Landscape	1	ls	$ 75,000	$ 75,000	
3. Major Process Equipment Items					
4. Mechanical Components					
Ducting and Insulation	1	ls	$ 50,000	$ 50,000	Duct and insulation installed. Est. from experience with IRM installation, with significant markup for inflation.
Blower	3	ea	$ 32,000	$ 96,000	100 hp blower. Per quote from Northern Blower to ARADIS dated 12/9/05 (plus inflation) plus installation. 2 duty plus one standby.
5. Electrical Components					
Building Controls and Distribution	1	ea	$ 50,000	$ 50,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 50,000	$ 50,000	Includes PLC and interlocks, alarms, etc.
6. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
Subtotal				**$ 507,000**	
Subtotal of Capital Costs				**$ 507,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5.0%	of	$ 507,000	$ 25,350	
2. Construction Management (7% of capital cost)	7.0%	of	$ 507,000	$ 35,490	
3. Project Management (10% of capital cost)	10.0%	of	$ 507,000	$ 50,700	
4. Construction Contingency (Union Labor; 15% of capital cost)	15.0%	of	$ 507,000	$ 76,050	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 507,000	$ 43,729	
Subtotal				**$ 232,000**	
TOTAL CAPITAL COST				**$ 739,000**	
Treatment Plant Annual O&M					
(Incremental Cost for Operation of additional 2,000 gpm)					
(2,000 gpm plant without vapor treatment)					
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 15,000	$ 15,000	10% of current IRM annual cost
Service Contractors (e.g., electrical, controls)	1	ls	$ 15,000	$ 15,000	10% of current IRM annual cost
Unscheduled O&M and System Repair	1	ls	$ 10,000	$ 10,000	
Air Stripper Blower Flow Rate	14,000	cfm			
Air Stripper Blower Pressure	0.8	psig			
Air Stripper Blower Electrical Horsepower	68	hp			
Annual Air Stripper Power Consumption	444,000	kW-h			
Booster Pump Flow Rate	2,000	gpm			
Booster Pump Pressure Requirement	0	psig			Assume WAGNN pays for booster pumping
Booster Pump Electrical Horsepower	0	hp			
Annual Booster Pump Power Requirement	0	kW-h			
Total Annual Power Requirement	444,000	$/kW-h			
Electricity	$0.13	$/kW-h	444,000	$ 58,000	
Project Management	1	ls	5% of above	$ 2,000	Excluding electricity cost
TOTAL ANNUAL O&M COST				**$ 100,000**	

Table C-E. Cost Estimate for Wellhead Treatment at Purveyor Well N5099

Basis of estimate:
- *1,000 gpm flow rate*
- *Need off-gas treatment*
- *Water treatment via air stripping for VOCs*
- *Treatment buildings need to be constructed with architectural brick & to house/hide air strippers*
- *Off-gas VOC concentrations need to be ND*

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 1,000 gpm Treatment Plant with Air Stripping					
1. General Site Preparation	0.5	ea	$ 90,000	$ 45,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	0.5	ea	$ 150,000	$ 75,000	Foundation (incl. clearwells)
Building	0.5	ea	$ 200,000	$ 100,000	Requires architectural brick
HVAC	0.5	ea	$ 25,000	$ 12,500	
Soil transport.	2,000	cy	$ 7.00	$ 14,000	
Final Grading, Fencing, and Landscape	0.5	ls	$ 100,000	$ 50,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 323,000	$ 323,000	Estimated from experience with OU2 and OU1 systems.
Clearwell Pumps	2	ea	$ 27,000	$ 54,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 75,000	$ 75,000	Bag Filter System.
4. Mechanical Components					
Ducting	1	ls	$ 50,000	$ 50,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Blower	2	ea	$ 32,000	$ 64,000	100 hp blower. Per quote from Northern Blower to ARADIS dated 12/9/05 (plus inflation)
5. Electrical Components					
Electrical Service Conduits, Transformer	1	ea	$ 90,000	$ 90,000	800 amp service
Power to Treatment Structure	250	ft	$ 100	$ 25,000	From source to treatment building
Building Controls and Distribution	0.5	ea	$ 115,000	$ 57,500	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
8. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 1,290,000**	
Subtotal of Capital Costs				**$ 1,290,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5.0%	of	$ 1,290,000	$ 64,500	
2. Construction Management (7% of capital cost)	7.0%	of	$ 1,290,000	$ 90,300	
3. Project Management (10% of capital cost)	10.0%	of	$ 1,290,000	$ 129,000	
4. Construction Contingency (Union Labor; 15% of capital cost)	15.0%	of	$ 1,290,000	$ 193,500	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 1,290,000	$ 111,263	
Subtotal				**$ 589,000**	
TOTAL CAPITAL COST				**$ 1,879,000**	
Treatment Plant/Equipment Annual O&M					
(1,000-gpm plant for Well N5099)					
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 15,000	$ 15,000	10% of current IRM annual cost
Service Contractors (e.g., electrical, controls)	1	ls	$ 15,000	$ 15,000	10% of current IRM annual cost
Unscheduled O&M and System Repair	1	ls	$ 10,000	$ 10,000	
Air Stripper Blower Flow Rate	7,000	cfm			
Air Stripper Blower Pressure	0.8	psig			
Air Stripper Blower Electrical Horsepower	34	hp			
Annual Air Stripper Power Consumption	222,000	kW-h			
Booster Pump Flow Rate	1,000	gpm			
Booster Pump Pressure Requirement	0	psig			Assume MLWD pays for booster pumping
Booster Pump Electrical Horsepower	0	hp			
Annual Booster Pump Power Requirement	0	kW-h			
Total Annual Power Requirement	222,000	$/kW-h			
Electricity	$0.13	$/kW-h	222,000	$ 29,000	
Project Management	1	ls	5% of above	$ 2,000	Excluding electricity cost
TOTAL ANNUAL O&M COST				**$ 71,000**	

Table C-F. Cost Estimate for Wellhead Treatment at Purveyor Well N5099 for Scenario 2c

Basis of estimate:
- *1,200-gpm flow rate*
- *No off-gas treatment*
- *Water treatment via air stripping for VOCs*
- *Treatment buildings need to be constructed with architectural brick & to house/hide air strippers*

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 1,200-gpm Treatment Plant with Air Stripping					
1. General Site Preparation	0.25	ea	$ 200,000	$ 50,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	0.5	ea	$ 100,000	$ 50,000	Foundation (incl. clearwells)
Building	4,600	sf	$ 250	$ 1,150,000	Cost based on RTKL architect's estimate
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	625	cy	$ 6.62	$ 4,139	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 350,000	$ 350,000	
Clearwell Pumps	2	ea	$ 27,000	$ 54,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 116,000	$ 116,000	Bag Filter System.
Ducting	0	ls	$ 225,000	$ -	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 50,000	$ 100,000	50 Hp pump. Est. from experience.
Blower	1	ea	$ 50,000	$ 50,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation) plus installation.
4. Mechanical Components					
Extraction Well Piping Leak Detection System	100	ft	$ 25	$ 2,500	
Process Piping	1	ls	$ 175,000	$ 175,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 120,000	$ 120,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	0.5	ea	$ 90,000	$ 45,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vault	100	ft	$ 35	$ 3,500	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 967,500	$ 970,000	
8. Electrical Installation	25%	of	$ 313,500	$ 78,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 3,789,000**	
Subtotal of Capital Costs				**$ 3,789,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 3,789,000	$ 189,450	
2. Construction Management (7% of capital cost)	7%	of	$ 3,789,000	$ 265,230	
3. Project Management (10% of capital cost)	10%	of	$ 3,789,000	$ 378,900	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 3,789,000	$ 568,350	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 3,789,000	$ 326,801	
Subtotal				**$ 1,729,000**	
TOTAL CAPITAL COST				**$ 5,518,000**	
Treatment Plant/Equipment Annual O&M					
(1,200-gpm plant for Well N5099)					
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 15,000	$ 15,000	10% of current IRM annual cost
Service Contractors (e.g., electrical, controls)	1	ls	$ 15,000	$ 15,000	10% of current IRM annual cost
Unscheduled O&M and System Repair	1	ls	$ 10,000	$ 10,000	
Air Stripper Blower Flow Rate	9,000	cfm			
Air Stripper Blower Pressure	0.8	psig			
Air Stripper Blower Electrical Horsepower	44	hp			
Annual Air Stripper Power Consumption	286,000	kW-h			
Booster Pump Flow Rate	1,200	gpm			
Booster Pump Pressure Requirement	75	psig			
Booster Pump Electrical Horsepower	78	hp			
Annual Booster Pump Power Requirement	509,000	kW-h			
Total Annual Power Requirement	795,000	$/kW-h			
Electricity	$0.13	$/kW-h	795,000	$ 104,000	
Project Management	1	ls	5% of above	$ 2,000	Excluding electricity cost
TOTAL ANNUAL O&M COST				**$ 146,000**	

Table C-G. Cost Estimate for Wellhead Treatment at Purveyor Well N5099 Scenario 4g and Scenario 4h

Basis of estimate:
- *1,200-gpm flow rate*
- *No off-gas treatment*
- *Water treatment via air stripping for VOCs*
- *Treatment buildings need to be constructed with architectural brick & to house/hide air strippers*

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 1,200-gpm Treatment Plant with Air Stripping					
1. General Site Preparation	0.25	ea	$ 200,000	$ 50,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	0.5	ea	$ 100,000	$ 50,000	Foundation (incl. clearwells)
Building	4,600	sf	$ 250	$ 1,150,000	Cost based on RTKL architect's estimate
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	625	cy	$ 6.62	$ 4,139	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 350,000	$ 350,000	
Clearwell Pumps	2	ea	$ 27,000	$ 54,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 116,000	$ 116,000	Bag Filter System.
Ducting	0	ls	$ 225,000	$ -	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 50,000	$ 100,000	50 Hp pump. Est. from experience.
Blower	1	ea	$ 50,000	$ 50,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation) plus installation.
4. Mechanical Components					
Extraction Well Piping Leak Detection System	100	ft	$ 25	$ 2,500	
Process Piping	1	ls	$ 175,000	$ 175,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 120,000	$ 120,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	0.5	ea	$ 90,000	$ 45,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vault	100	ft	$ 35	$ 3,500	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 967,500	$ 970,000	
8. Electrical Installation	25%	of	$ 313,500	$ 78,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 3,789,000**	
Subtotal of Capital Costs				**$ 3,789,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 3,789,000	$ 189,450	
2. Construction Management (7% of capital cost)	7%	of	$ 3,789,000	$ 265,230	
3. Project Management (10% of capital cost)	10%	of	$ 3,789,000	$ 378,900	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 3,789,000	$ 568,350	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 3,789,000	$ 326,801	
Subtotal				**$ 1,729,000**	
TOTAL CAPITAL COST				**$ 5,518,000**	

O&M Costs included on sheet Scenario 4h

Table C-H Cost Estimate for N5099 Replacement

Double-Contained 8-Inch HDPE Piping from New Well to Chattem Treatment System
Single-Walled 8-Inch HDPE Piping from Chattem Treatment System to IU Willets Connection Point
Install New Extraction Well to Replace N5099
Operate 1,200-gpm Extraction Well
Operate 1,200-gpm Treatment System

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install New Extraction Well					
Install Replacement Well for N5099	1	ea	$ 875,000	$ 875,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Access Fee	1	ea	$ 50,000	$ 50,000	
3. Well Permitting Fee	1	ea	$ 20,000	$ 20,000	
4. Discharge Piping to Treatment Plant and Treated Water Return Pipe	3,000	ft	$ 225	$ 675,000	Includes double-walled 8" HDPE and single-wall HDPE piping, trenching and restoration.
Subtotal				**$ 1,620,000**	
Install 1,200-gpm System at Chattem to Treat Replacement Well					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	0.25	ea	$ 200,000	$ 50,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	0.5	ea	$ 100,000	$ 50,000	Foundation (incl. clearwells)
Building	4,600	sf	$ 250	$ 1,150,000	Cost based on RTKL architect's estimate
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	625	cy	$ 6.62	$ 4,139	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 350,000	$ 350,000	
Off-gas Treatment Vessels, filled with media	0	ls	$ 372,000	$ -	Excludes Vapor Treatment
Horizontal Mist Eliminator and Knock-Out Tank	0	ea	$ 11,000	$ -	Excludes Vapor Treatment
Duct Heater	0	ea	$ 37,000	$ -	Excludes Vapor Treatment
Clearwell Pumps	2	ea	$ 27,000	$ 54,000	Assumes two 20 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 116,000	$ 116,000	Bag Filter System.
Ducting	0	ls	$ 225,000	$ -	Excludes Vapor Treatment
Discharge Pump	2	ea	$ 50,000	$ 100,000	100 Hp pump. Est. from experience.
Blower	1	ea	$ 50,000	$ 50,000	100 hp blower. Per quote from Northern Blower to ARCADIS
4. Mechanical Components					
Extraction Well Piping Leak Detection System	3,000	ft	$ 25	$ 75,000	
Process Piping	1	ls	$ 175,000	$ 175,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 120,000	$ 120,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	0.5	ea	$ 90,000	$ 45,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	100	ft	$ 35	$ 3,500	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 1,040,000	$ 1,040,000	
8. Electrical Installation	25%	of	$ 313,500	$ 78,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 3,931,000**	
Subtotal of Capital Costs				**$ 5,551,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 5,551,000	$ 277,550	
2. Construction Management (7% of capital cost)	7%	of	$ 5,551,000	$ 388,570	
3. Project Management (10% of capital cost)	10%	of	$ 5,551,000	$ 555,100	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 5,551,000	$ 832,650	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 5,551,000	$ 478,774	
Subtotal				$ 2,533,000	
TOTAL CAPITAL COST				**$ 8,100,000**	
(New 1,200-gpm Replacement Treatment System)					Utility costs based on average treatment system flow rate of 600 gpm
GWTS Operations, Checklist and Inspections	0	ls	$ 256,000	$ -	Purveyor Responsibility
Monthly Compliance Sampling/Analysis and Alarm Testing	0	ls	$ 56,000	$ -	Purveyor Responsibility
Quarterly O&M Activities - Preventative Maintenance	0	ls	$ 80,000	$ -	Purveyor Responsibility
Extraction Well Cleaning and Redevelopment	0	ls	$ 190,000	$ -	Purveyor Responsibility
Monthly Utility Expenses, including electric	1	ls	$ 75,000	$ 75,000	Includes reimbursement of booster pump and air stripper blower, excludes lifting costs
Monthly Service Contractors (e.g., electrical, controls)	0	ls	$ 120,000	$ -	Purveyor Responsibility
Vapor Phase Carbon Replacement	0	ls	$ 100,000	$ -	No Vapor Treatment
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	No Vapor Treatment
Quarterly Progress Reports to NYSDEC	0	ls	$ 28,000	$ -	Purveyor Responsibility
Unscheduled O&M and System Repair	1%	of	$ 8,100,000	$ 81,000	1% of capital costs
OM&M Plan Revisions and As-Builts	0	ls	$ 32,000	$ -	Purveyor Responsibility
Annual GWTS Performance Analysis	0	ls	$ 28,800	$ -	Purveyor Responsibility
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 200,000**	

Table C-I. Cost Estimate for Upgrades to Community Drive WAGNN Wellhead Treatment System

Basis of estimate:
- *Flow rate = 3,500 gpm*
- *2 exist. Wells, 1 new well being added and upgrading treatment plant from LPGAC to Air Stripping*
- *Based on estimate from Grosser (2006)*

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install Upgraded 3,500-gpm Treatment Plant for WAGNN (Air Stripping)					
1. General Site Prep.	0.5	ea	$ 143,000	$ 71,500	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	0.5	ea	$ 550,000	$ 275,000	Foundation (incl. clearwells)
Building Construction	0.5	ea	$ 269,000	$ 134,500	
3. Major Process Equipment Items					
Air Stripping Tower + Installation	1	ls	$ 1,122,000	$ 1,122,000	
Clearwell Pumps	2	ea	$ 27,000	$ 54,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	0	ls	$ 75,000	$ -	Bag Filter System.
Ducting	1	ls	$ 75,000	$ 75,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	4	ea	$ 27,000	$ 108,000	50 hp pump. Est. from experience.
Blower	4	ea	$ 32,000	$ 128,000	100 hp blower. Per quote from Northern Blower to ARADIS dated 12/9/05 (plus inflation) plus installation.
4. Mechanical Components					
Air Stripper Tower Influent, Effluent Piping, Valves	1	ls	$ 212,000	$ 212,000	
Mechanical Work from Booster Pumps to Chemical Treatment	1	ls	$ 288,000	$ 288,000	
5. Electrical Components					
Well N13000b - New Service and MCC	1	ls	$ 365,000	$ 365,000	
Instrumentation and Controls Modifications	1	ls	$ 160,000	$ 160,000	
New Generator and Modifications to Louvers	0	ls	$ 815,000	$ -	Eliminated per CDM (W. Glynn) comments of 8/18/2010
6. Building Security System	0.5	ls	$ 25,000	$ 12,500	Alarm system.
7. Treatment System Operational Testing and Startup	1	ls	$ 25,000	$ 25,000	Includes laboratory sample analysis.
Subtotal of Capital Costs				**$ 3,031,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	0%	of	$ 3,031,000	$ -	Paid for by WAGNN
2. Construction Management (7% of capital cost)	0%	of	$ 3,031,000	$ -	
3. Project Management (10% of capital cost)	0%	of	$ 3,031,000	$ -	
4. Construction Contingency (Union Labor; 15% of capital cost)	0%	of	$ 3,031,000	$ -	
5. New York State Sales Tax (8.625% of capital cost)	0%	of	$ 3,031,000	$ -	
Subtotal				**$** -	
TOTAL CAPITAL COST				**$ 3,031,000**	
Treatment Plant/Equipment Annual O&M					
(4,000-gpm plant)					
Utilities including electricity	1	ls	$ 160,000	$ 160,000	Per WAGNN engineering consultant (Grosser) approximately 6/09
TOTAL ANNUAL O&M COST				**$ 160,000**	

Table C-1. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	N12796 & N4388 Capital Cost	N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Welhead Pre-Escalated Cost	Total Escalated Cost (FV)	Total PV (Cost)	Total Capital FV	Total O&M FV	Total FV Cost			Total Capital PV	Total O&M PV	Total NPV Cost		
1					$ 1,515,500		$ 1,515,500	$ 1,568,543	$ 1,452,354	$ 1,568,543	$ -	$ 1,568,543			$ 1,452,354	$ -	$ 1,452,354		
2					$ 1,515,500		$ 1,515,500	$ 1,623,441	$ 1,391,839	$ 1,623,441	$ -	$ 1,623,441			$ 1,391,839	$ -	$ 1,391,839		
3					$ -	$ 160,000	$ 160,000	$ 177,395	$ 140,822	$ -	$ 177,395	$ 177,395			$ -	$ 140,822	$ 140,822		
4			$ 939,500		$ -	$ 160,000	$ 1,099,500	$ 1,261,702	$ 927,388	$ 1,078,098	$ 183,604	$ 1,261,702			$ 792,434	$ 134,954	$ 927,388		
5			$ 939,500		$ -	$ 160,000	$ 1,099,500	$ 1,305,861	$ 888,747	$ 1,115,831	$ 190,030	$ 1,305,861			$ 759,416	$ 129,331	$ 888,747		
6			$ -	$ 71,000	$ 31,807	$ 160,000	$ 262,807	$ 323,057	$ 203,581	$ 39,099	$ 283,958	$ 323,057			$ 24,639	$ 178,942	$ 203,581		
7			$ -	$ 69,580	$ -	$ 160,000	$ 229,580	$ 292,090	$ 170,432	$ -	$ 292,090	$ 292,090			$ -	$ 170,432	$ 170,432		
8			$ -	$ 68,188	$ -	$ 160,000	$ 228,188	$ 300,481	$ 162,340	$ -	$ 300,481	$ 300,481			$ -	$ 162,340	$ 162,340		
9			$ 93,950	$ 66,825	$ -	$ 160,000	$ 320,775	$ 437,183	$ 218,700	$ 128,044	$ 309,139	$ 437,183			$ 64,054	$ 154,646	$ 218,700		
10			$ -	$ 65,488	$ -	$ 160,000	$ 225,488	$ 318,073	$ 147,329	$ -	$ 318,073	$ 318,073			$ -	$ 147,329	$ 147,329		
11			$ -	$ 64,178	$ 31,807	$ 160,000	$ 255,985	$ 373,731	$ 160,287	$ 46,437	$ 327,294	$ 373,731			$ 19,916	$ 140,371	$ 160,287		
12			$ -	$ 62,895	$ -	$ 160,000	$ 222,895	$ 336,809	$ 133,752	$ -	$ 336,809	$ 336,809			$ -	$ 133,752	$ 133,752		
13			$ -	$ 61,637	$ -	$ 160,000	$ 221,637	$ 346,630	$ 127,455	$ -	$ 346,630	$ 346,630			$ -	$ 127,455	$ 127,455		
14			$ 93,950	$ 60,404	$ -	$ 160,000	$ 314,354	$ 508,843	$ 173,241	$ 152,076	$ 356,767	$ 508,843			$ 51,776	$ 121,465	$ 173,241		
15			$ -	$ 59,196	$ -	$ 160,000	$ 219,196	$ 367,230	$ 115,766	$ -	$ 367,230	$ 367,230			$ -	$ 115,766	$ 115,766		
16			$ -	$ 58,012	$ 31,807	$ 160,000	$ 249,819	$ 433,183	$ 126,442	$ 55,153	$ 378,030	$ 433,183			$ 16,099	$ 110,343	$ 126,442		
17	$ 739,000		$ -	$ 56,852	$ -	$ 160,000	$ 955,852	$ 1,715,444	$ 463,631	$ 1,326,265	$ 389,179	$ 1,715,444			$ 358,448	$ 105,183	$ 463,631		
18	$ -	$ 100,000	$ -	$ 55,715	$ -	$ 160,000	$ 315,715	$ 586,437	$ 146,755	$ -	$ 586,437	$ 586,437	*Capital*	*O&M*	$ -	$ 146,755	$ 146,755	*Capital*	*O&M*
19	$ -	$ 98,000	$ 93,950	$ 54,601	$ -	$ 160,000	$ 406,551	$ 781,594	$ 181,105	$ 180,619	$ 600,975	$ 781,594	*20 yr FV*	*20 yr FV*	$ 41,852	$ 139,253	$ 181,105	*20 yr NPV*	*20 yr NPV*
20	$ -	$ 96,040	$ -	$ 53,509	$ -	$ 160,000	$ 309,549	$ 615,936	$ 132,148	$ -	$ 615,936	$ 615,936	*$ 7,314,000*	*$6,360,000*	$ -	$ 132,148	$ 132,148	*$ 4,973,000*	*$ 2,491,000*
21	$ 36,950	$ 94,119	$ -	$ 52,438	$ 31,807	$ 160,000	$ 375,314	$ 772,934	$ 153,548	$ 141,600	$ 631,334	$ 772,934			$ 28,130	$ 125,418	$ 153,548		
22	$ -	$ 92,237	$ -	$ 51,390	$ -	$ 160,000	$ 303,626	$ 647,183	$ 119,043	$ -	$ 647,183	$ 647,183			$ -	$ 119,043	$ 119,043		
23	$ -	$ 90,392	$ -	$ 50,362	$ -	$ 160,000	$ 300,754	$ 663,498	$ 113,004	$ -	$ 663,498	$ 663,498			$ -	$ 113,004	$ 113,004		
24	$ -	$ 88,584	$ 93,950	$ 49,355	$ -	$ 160,000	$ 391,889	$ 894,811	$ 141,111	$ 214,519	$ 680,292	$ 894,811			$ 33,829	$ 107,282	$ 141,111		
25	$ -	$ 86,813	$ -	$ 48,368	$ -	$ 160,000	$ 295,180	$ 697,583	$ 101,860	$ -	$ 697,583	$ 697,583			$ -	$ 101,860	$ 101,860		
26	$ 36,950	$ 85,076	$ -	$ 47,400	$ 31,807	$ 160,000	$ 361,233	$ 883,562	$ 119,459	$ 168,176	$ 715,385	$ 883,562			$ 22,738	$ 96,721	$ 119,459		
27	$ -	$ 83,375	$ -	$ 46,452	$ -	$ 160,000	$ 289,827	$ 733,716	$ 91,852	$ -	$ 733,716	$ 733,716			$ -	$ 91,852	$ 91,852		
28	$ -	$ 81,707	$ -	$ 45,523	$ -	$ 160,000	$ 287,230	$ 752,593	$ 87,236	$ -	$ 752,593	$ 752,593			$ -	$ 87,236	$ 87,236		
29	$ -	$ 80,073	$ 93,950	$ 44,613	$ -	$ 160,000	$ 378,636	$ 1,026,814	$ 110,205	$ 254,781	$ 772,033	$ 1,026,814			$ 27,345	$ 82,860	$ 110,205		
30	$ -	$ 78,472	$ -	$ 43,720	$ -	$ 160,000	$ 282,192	$ 792,055	$ 78,712	$ -	$ 792,055	$ 792,055			$ -	$ 78,712	$ 78,712		
	$ 812,900	**$ 1,154,888**	**$ 2,348,750**	**$ 1,407,700**	**$ 3,190,034**	**$ 4,480,000**	**$ 13,395,000**	**$ 21,539,000**	**$ 8,581,000**	**$ 8,093,000**	**$ 13,446,000**	**$ 21,539,000**			**$ 5,084,869**	**$ 3,495,276**	**$ 8,580,145**		

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (following installation of 5 additional wells)
2. Every 3 years, annual sampling is required for 130 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. New groundwater monitoring wells will be installed in years 1 and 2; wells will be dual completion in Mid and Basal Magothy

9. IRM O&M costs are based on the 2008 budgeted costs proposed to LMC (except as noted)

Table C-2. Cost Estimate for OU-2 Remedial Alternative 2a, Outpost Groundwater Monitoring, Continued Operation of the OU-2 IRM for 30 Years
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 2,000,000	$ 100,000	
2. Construction Management (7% of capital cost)	7%	of	$ 2,000,000	$ 140,000	
3. Project Management (10% of capital cost)	10%	of	$ 2,000,000	$ 200,000	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 2,000,000	$ 300,000	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 2,000,000	$ 172,500	
Subtotal				**$ 913,000**	
TOTAL CAPITAL COST				**$ 2,913,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 320,000	$ 320,000	2010 spend
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 70,000	$ 70,000	2010 spend
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 100,000	$ 100,000	2010 spend
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	1.3 times 2007 average electric usage (based on new hp/old hp); 1.3 times 2007 average natural gas usage
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 35,000	$ 35,000	2010 spend
Unscheduled O&M and System Repair	1	ls	$ 150,000	$ 150,000	2010 spend
OM&M Plan Revisions and As-Builts	1	ls	$ 40,000	$ 40,000	2010 spend
Annual GWTS Performance Analysis	1	ls	$ 36,000	$ 36,000	2010 spend
Project Management	1	ls	$ 55,000	$ 55,000	2010 spend
ANNUAL O&M COST				**$ 1,364,000**	

Table C-2. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost (1)	Monitoring Cost	OU-2 Capital Improvements	OU-2 O&M Cost	OU-2 Pre-Escalated Cost	OU-2 Escalated Cost (FV)	OU-2 NPV Cost
1	$ 1,456,500	$ 41,000		$ 1,364,000	$ 2,861,500	$ 2,961,653	$ 2,742,271
2	$ 1,456,500	$ 41,000		$ 1,336,720	$ 2,834,220	$ 3,036,087	$ 2,602,956
3		$ 96,000	$ -	$ 1,309,986	$ 1,405,986	$ 1,558,841	$ 1,237,459
4		$ 36,000	$ -	$ 1,283,786	$ 1,319,786	$ 1,514,485	$ 1,113,191
5		$ 36,000	$ -	$ 1,258,110	$ 1,294,110	$ 1,536,997	$ 1,046,054
6		$ 96,000	$ -	$ 1,232,948	$ 1,328,948	$ 1,633,616	$ 1,029,455
7		$ 36,000	$ 300,000	$ 1,208,289	$ 1,544,289	$ 1,964,767	$ 1,146,423
8		$ 36,000	$ -	$ 1,184,123	$ 1,220,123	$ 1,606,669	$ 868,033
9		$ 96,000	$ -	$ 1,160,441	$ 1,256,441	$ 1,712,400	$ 856,626
10		$ 36,000	$ -	$ 1,137,232	$ 1,173,232	$ 1,654,960	$ 766,566
11		$ 36,000	$ -	$ 1,114,487	$ 1,150,487	$ 1,679,677	$ 720,385
12		$ 96,000	$ 300,000	$ 1,092,198	$ 1,488,198	$ 2,248,769	$ 893,017
13		$ 36,000	$ -	$ 1,070,354	$ 1,106,354	$ 1,730,288	$ 636,223
14		$ 36,000	$ -	$ 1,048,947	$ 1,084,947	$ 1,756,197	$ 597,917
15		$ 96,000	$ -	$ 1,027,968	$ 1,123,968	$ 1,883,038	$ 593,612
16		$ 36,000	$ -	$ 1,007,408	$ 1,043,408	$ 1,809,255	$ 528,104
17		$ 36,000	$ 300,000	$ 987,260	$ 1,323,260	$ 2,374,823	$ 641,841
18		$ 96,000	$ -	$ 967,515	$ 1,063,515	$ 1,975,467	$ 494,359
19		$ 36,000	$ -	$ 948,165	$ 984,165	$ 1,892,058	$ 438,413
20		$ 36,000	$ -	$ 929,201	$ 965,201	$ 1,920,547	$ 412,050
21		$ 96,000	$ -	$ 910,617	$ 1,006,617	$ 2,073,059	$ 411,825
22		$ 36,000	$ 300,000	$ 892,405	$ 1,228,405	$ 2,618,359	$ 481,622
23		$ 36,000	$ -	$ 874,557	$ 910,557	$ 2,008,793	$ 342,128
24		$ 96,000	$ -	$ 857,066	$ 953,066	$ 2,176,162	$ 343,179
25		$ 36,000	$ -	$ 839,924	$ 875,924	$ 2,070,024	$ 302,261
26		$ 36,000	$ -	$ 823,126	$ 859,126	$ 2,101,386	$ 284,111
27		$ 96,000	$ 300,000	$ 806,663	$ 1,202,663	$ 3,044,623	$ 381,147
28		$ 36,000	$ -	$ 790,530	$ 826,530	$ 2,165,651	$ 251,029
29		$ 36,000	$ -	$ 774,720	$ 810,720	$ 2,198,572	$ 235,967
30		$ 96,000	$ -	$ 759,225	$ 855,225	$ 2,400,440	$ 238,549
	$ 2,913,000			$30,997,969	$ 37,100,969	$ 61,307,663	$ 22,637,000

(1) New groundwater monitoring wells (5) installation

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (following installation of 5 additional wells)
2. Every 3 years, annual sampling is required for 130 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. New groundwater monitoring wells will be installed in years 1 and 2; wells will be dual completion in Mid and Basal Magothy

9. IRM O&M costs are based on the 2008 budgeted costs proposed to LMC (except as noted)

Table C-3. Cost Estimate for OU-2 Remedial Alternative 2b, Outpost Groundwater Monitoring, Continued Operation of the OU-2 IRM for 30 Years

Install 1 New Extraction Well into Basal Magothy at OU-1 (EW1D)
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Well					
1. EW1D Extraction Well Installation	1	ea	$ 875,000	$ 875,000	Typ. diffusion well cost + 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Permitting Fee	1	ea	$ 20,000	$ 20,000	
Subtotal of Capital Costs				**$ 2,895,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 2,895,000	$ 144,750	
2. Construction Management (7% of capital cost)	7%	of	$ 2,895,000	$ 202,650	
3. Project Management (10% of capital cost)	10%	of	$ 2,895,000	$ 289,500	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 2,895,000	$ 434,250	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 2,895,000	$ 249,694	
Subtotal				**$ 1,321,000**	
TOTAL CAPITAL COST				**$ 4,216,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 320,000	$ 320,000	2010 spend
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 70,000	$ 70,000	2010 spend
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 100,000	$ 100,000	2010 spend
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	1.3 times 2007 average electric usage (based on new hp/old hp); 1.3 times 2007 average natural
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 35,000	$ 35,000	2010 spend
Unscheduled O&M and System Repair	1	ls	$ 150,000	$ 150,000	2010 spend
OM&M Plan Revisions and As-Builts	1	ls	$ 40,000	$ 40,000	2010 spend
Annual GWTS Performance Analysis	1	ls	$ 36,000	$ 36,000	2010 spend
Project Management	1	ls	$ 55,000	$ 55,000	2010 spend
TOTAL ANNUAL O&M COST				**$ 1,364,000**	

Table C-3. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost [1]	Monitoring Cost	O&M Cost	Capital Improvement	OU-2 Total Pre-Escalated Cost	OU-2 Total Escalated Cost (FV)	OU-2 Total PV (Cost)
1	$ 2,108,000	$ 41,000	$ 1,364,000		$ 3,513,000	$ 3,635,955	$ 3,366,625
2	$ 2,108,000	$ 41,000	$ 1,364,000		$ 3,513,000	$ 3,763,213	$ 3,226,349
3		$ 96,000	$ 1,735,000	$ -	$ 1,831,000	$ 2,030,062	$ 1,611,529
4		$ 36,000	$ 1,700,300	$ -	$ 1,736,300	$ 1,992,444	$ 1,464,506
5		$ 36,000	$ 1,666,294	$ -	$ 1,702,294	$ 2,021,791	$ 1,375,997
6		$ 96,000	$ 1,632,968	$ -	$ 1,728,968	$ 2,125,343	$ 1,339,327
7		$ 36,000	$ 1,600,309	$ 300,000	$ 1,936,309	$ 2,463,525	$ 1,437,443
8		$ 36,000	$ 1,568,303	$ -	$ 1,604,303	$ 2,112,560	$ 1,141,351
9		$ 96,000	$ 1,536,937	$ -	$ 1,632,937	$ 2,225,525	$ 1,113,317
10		$ 36,000	$ 1,506,198	$ -	$ 1,542,198	$ 2,175,422	$ 1,007,641
11		$ 36,000	$ 1,476,074	$ -	$ 1,512,074	$ 2,207,582	$ 946,794
12		$ 96,000	$ 1,446,552	$ 300,000	$ 1,842,552	$ 2,784,223	$ 1,105,653
13		$ 36,000	$ 1,417,621	$ -	$ 1,453,621	$ 2,273,400	$ 835,924
14		$ 36,000	$ 1,389,269	$ -	$ 1,425,269	$ 2,307,075	$ 785,469
15		$ 96,000	$ 1,361,484	$ -	$ 1,457,484	$ 2,441,793	$ 769,755
16		$ 36,000	$ 1,334,254	$ -	$ 1,370,254	$ 2,376,001	$ 693,532
17		$ 36,000	$ 1,307,569	$ 300,000	$ 1,643,569	$ 2,949,673	$ 797,205
18		$ 96,000	$ 1,281,417	$ -	$ 1,377,417	$ 2,558,538	$ 640,272
19		$ 36,000	$ 1,255,789	$ -	$ 1,291,789	$ 2,483,466	$ 575,449
20		$ 36,000	$ 1,230,673	$ -	$ 1,266,673	$ 2,520,412	$ 540,750
21		$ 96,000	$ 1,206,060	$ -	$ 1,302,060	$ 2,681,503	$ 532,696
22		$ 36,000	$ 1,181,939	$ 300,000	$ 1,517,939	$ 3,235,504	$ 595,140
23		$ 36,000	$ 1,158,300	$ -	$ 1,194,300	$ 2,634,762	$ 448,740
24		$ 96,000	$ 1,135,134	$ -	$ 1,231,134	$ 2,811,083	$ 443,306
25		$ 36,000	$ 1,112,431	$ -	$ 1,148,431	$ 2,714,024	$ 396,296
26		$ 36,000	$ 1,090,183	$ -	$ 1,126,183	$ 2,754,596	$ 372,426
27		$ 96,000	$ 1,068,379	$ 300,000	$ 1,464,379	$ 3,707,173	$ 464,089
28		$ 36,000	$ 1,047,011	$ -	$ 1,083,011	$ 2,837,676	$ 328,926
29		$ 36,000	$ 1,026,071	$ -	$ 1,062,071	$ 2,880,207	$ 309,125
30		$ 96,000	$ 1,005,550	$ -	$ 1,101,550	$ 3,091,823	$ 307,257
	$ 4,216,000				$ 47,612,067	$ 78,797,000	**$ 28,973,000**

[1] Installation of (5) new groundwater monitoring wells; upgrades to IRM system, installation of extraction wells and diffusion wells

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (after 5 additional wells are installed)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. Extracted water from RW-400 will be tied in with discharge from RW-100 prior to conveyance to the OU2 IRM system. No upgrades to the RW-100 to OU2 IRM header will be required.
9. 500-gpm OU2 treatment plant upgrade: Upgrade 2 clearwell transfer pumps, upgrade distribution trays for air stripper; do not need to upgrade VPGAC ECUs, PPZ ECUs or IRM discharge line to existing diffusion wells
10. For new diffusion wells, tie in piping about halfway from plant to existing wells
11. O&M Costs for Upgraded Plant: Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on flow rate ratio of new higher hp to old hp
* Assume VPGAC Media Costs are increased by 100% (since flow rate will roughly double and new flow will conservatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment PPZ media will be required 20% more often due to add inflow from well RW-300/400
13. Capital Upgrades:
    Years 1 and 2 - Install New Groundwater Monitoring, Extraction and Diffusion Wells
    Year 2 - Install Upgrades to IRM System and Connect Piping (Design will be performed during year 1)

Table C-4. Cost Estimate for OU-2 Remedial Alternative 2c, Outpost Groundwater Monitoring, Continued Operation of the OU-2 IRM for 30 Years

Install 1 New Extraction Well into Basal Magothy at OU-1 (EW1D)
Install 4 New Groundwater Monitoring Wells into Basal Magothy
Operate N5099 at 1,200-gpm and discharge into distribution system
Install an additional remediation well adjacent to N5099

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Well					
1. EW1D Remediation Well Installation	1	ea	$ 875,000	$ 875,000	Typ. diffusion well cost + 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Permitting Fee	1	ea	$ 20,000	$ 20,000	
Subtotal of Capital Costs				**$ 2,895,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 2,895,000	$ 144,750	
2. Construction Management (7% of capital cost)	7%	of	$ 2,895,000	$ 202,650	
3. Project Management (10% of capital cost)	10%	of	$ 2,895,000	$ 289,500	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 2,895,000	$ 434,250	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 2,895,000	$ 249,694	
Subtotal				**$ 1,321,000**	
TOTAL CAPITAL COST				**$ 4,216,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 320,000	$ 320,000	2010 spend
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 70,000	$ 70,000	2010 spend
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 100,000	$ 100,000	2010 spend
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	1.3 times 2007 average electric usage (based on new hp/old hp); 1.3 times 2007 average natural gas usage
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 35,000	$ 35,000	2010 spend
Unscheduled O&M and System Repair	1	ls	$ 150,000	$ 150,000	2010 spend
OM&M Plan Revisions and As-Builts	1	ls	$ 40,000	$ 40,000	2010 spend
Annual GWTS Performance Analysis	1	ls	$ 36,000	$ 36,000	2010 spend
Project Management	1	ls	$ 55,000	$ 55,000	2010 spend
TOTAL ANNUAL O&M COST				**$ 1,364,000**	

Table C-4. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

2g

Year	Capital Cost [1]	Monitoring Cost	O&M Cost	Capital Improvement	OU-2 Total Pre-Escalated Cost	OU-2 Total Escalated Cost (FV)	OU-2 Total PV (Cost)	OU-2 Total Capital FV	OU-2 Total O&M FV	OU-2 Capital NPV	OU-2 O&M NPV
1	$ 2,108,000	$ 41,000	$ 1,364,000		$ 3,513,000	$ 3,635,955	$ 3,366,625	$ 2,181,780	$ 1,454,175	$ 2,020,167	$ 1,346,458
2	$ 2,108,000	$ 41,000	$ 1,364,000		$ 3,513,000	$ 3,763,213	$ 3,226,349	$ 2,258,142	$ 1,505,071	$ 1,935,993	$ 1,290,356
3		$ 96,000	$ 1,364,000	$ -	$ 1,460,000	$ 1,618,728	$ 1,284,999	$ -	$ 1,618,728	$ -	$ 1,284,999
4		$ 36,000	$ 1,336,720	$ -	$ 1,372,720	$ 1,575,228	$ 1,157,839	$ -	$ 1,575,228	$ -	$ 1,157,839
5		$ 36,000	$ 1,309,986	$ -	$ 1,345,986	$ 1,598,609	$ 1,087,986	$ -	$ 1,598,609	$ -	$ 1,087,986
6		$ 96,000	$ 1,283,786	$ -	$ 1,379,786	$ 1,696,109	$ 1,068,836	$ -	$ 1,696,109	$ -	$ 1,068,836
7		$ 36,000	$ 1,258,110	$ 300,000	$ 1,594,110	$ 2,028,153	$ 1,183,408	$ 381,684	$ 1,646,470	$ 222,709	$ 960,699
8		$ 36,000	$ 1,232,948	$ -	$ 1,268,948	$ 1,670,962	$ 902,769	$ -	$ 1,670,962	$ -	$ 902,769
9		$ 96,000	$ 1,208,289	$ -	$ 1,304,289	$ 1,777,612	$ 889,249	$ -	$ 1,777,612	$ -	$ 889,249
10		$ 36,000	$ 1,184,123	$ -	$ 1,220,123	$ 1,721,104	$ 797,204	$ -	$ 1,721,104	$ -	$ 797,204
11		$ 36,000	$ 1,160,441	$ -	$ 1,196,441	$ 1,746,767	$ 749,159	$ -	$ 1,746,767	$ -	$ 749,159
12		$ 96,000	$ 1,137,232	$ 300,000	$ 1,533,232	$ 2,316,819	$ 920,041	$ 453,321	$ 1,863,498	$ 180,020	$ 740,021
13		$ 36,000	$ 1,114,487	$ -	$ 1,150,487	$ 1,799,312	$ 661,603	$ -	$ 1,799,312	$ -	$ 661,603
14		$ 36,000	$ 1,092,198	$ -	$ 1,128,198	$ 1,826,207	$ 621,752	$ -	$ 1,826,207	$ -	$ 621,752
15		$ 96,000	$ 1,070,354	$ -	$ 1,166,354	$ 1,954,049	$ 615,998	$ -	$ 1,954,049	$ -	$ 615,998
16		$ 36,000	$ 1,048,947	$ -	$ 1,084,947	$ 1,881,282	$ 549,128	$ -	$ 1,881,282	$ -	$ 549,128
17		$ 36,000	$ 1,027,968	$ 300,000	$ 1,363,968	$ 2,447,879	$ 661,586	$ 538,403	$ 1,909,477	$ 145,514	$ 516,072
18		$ 96,000	$ 1,007,408	$ -	$ 1,103,408	$ 2,049,569	$ 512,903	$ -	$ 2,049,569	$ -	$ 512,903
19		$ 36,000	$ 987,260	$ -	$ 1,023,260	$ 1,967,219	$ 455,828	$ -	$ 1,967,219	$ -	$ 455,828
20		$ 36,000	$ 967,515	$ -	$ 1,003,515	$ 1,996,783	$ 428,406	$ -	$ 1,996,783	$ -	$ 428,406
21		$ 96,000	$ 948,165	$ -	$ 1,044,165	$ 2,150,385	$ 427,186	$ -	$ 2,150,385	$ -	$ 427,186
22		$ 36,000	$ 929,201	$ 300,000	$ 1,265,201	$ 2,696,791	$ 496,049	$ 639,453	$ 2,057,338	$ 117,621	$ 378,428
23		$ 36,000	$ 910,617	$ -	$ 946,617	$ 2,088,346	$ 355,677	$ -	$ 2,088,346	$ -	$ 355,677
24		$ 96,000	$ 892,405	$ -	$ 988,405	$ 2,256,853	$ 355,904	$ -	$ 2,256,853	$ -	$ 355,904
25		$ 36,000	$ 874,557	$ -	$ 910,557	$ 2,151,869	$ 314,211	$ -	$ 2,151,869	$ -	$ 314,211
26		$ 36,000	$ 857,066	$ -	$ 893,066	$ 2,184,402	$ 295,335	$ -	$ 2,184,402	$ -	$ 295,335
27		$ 96,000	$ 839,924	$ 300,000	$ 1,235,924	$ 3,128,826	$ 391,688	$ 759,470	$ 2,369,355	$ 95,076	$ 296,612
28		$ 36,000	$ 823,126	$ -	$ 859,126	$ 2,251,058	$ 260,928	$ -	$ 2,251,058	$ -	$ 260,928
29		$ 36,000	$ 806,663	$ -	$ 842,663	$ 2,285,200	$ 245,265	$ -	$ 2,285,200	$ -	$ 245,265
30		$ 96,000	$ 790,530	$ -	$ 886,530	$ 2,488,307	$ 247,281	$ -	$ 2,488,307	$ -	$ 247,281
	$ 4,216,000				$ 39,598,025	$ 64,754,000	**$ 24,532,000**	$ 7,213,000	$ 57,542,000	$ 4,718,000	$ 19,815,000

Year	N12796 & N4388 Capital Cost	N12796 & N4389 N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Welhead Pre-Escalated Cost	Total Pre-Escalated Cost	Total Escalated Cost (FV)	Total NPV Cost
1			$ 2,759,000		$ 1,515,500		$ 4,274,500	$ 7,787,500	$ 8,060,063	$ 7,463,021
2			$ 2,759,000		$ 1,515,500		$ 4,274,500	$ 7,787,500	$ 8,342,165	$ 7,152,062
3			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,766,000	$ 1,957,996	$ 1,554,320
4			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,678,720	$ 1,926,370	$ 1,415,939
5			$ 275,900	$ 146,000	$ 31,807	$ 160,000	$ 613,707	$ 1,959,692	$ 2,327,500	$ 1,584,057
6			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,685,786	$ 2,072,261	$ 1,305,876
7			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,900,110	$ 2,417,471	$ 1,410,571
8			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,574,948	$ 2,073,906	$ 1,120,467
9			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,610,289	$ 2,194,659	$ 1,097,876
10			$ 275,900	$ 146,000	$ 31,807	$ 160,000	$ 613,707	$ 1,833,830	$ 2,586,798	$ 1,198,188
11			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,502,441	$ 2,193,518	$ 940,762
12			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,839,232	$ 2,779,206	$ 1,103,661
13			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,456,487	$ 2,277,882	$ 837,573
14			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,434,198	$ 2,321,528	$ 790,390
15			$ 275,900	$ 146,000	$ 31,807	$ 160,000	$ 613,707	$ 1,780,060	$ 2,982,222	$ 940,121
16			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,390,947	$ 2,411,882	$ 704,005
17			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,669,968	$ 2,997,050	$ 810,010
18			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,409,408	$ 2,617,961	$ 655,142
19			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,329,260	$ 2,555,504	$ 592,141
20	$ 739,000		$ 275,900	$ 146,000	$ 31,807	$ 160,000	$ 1,352,707	$ 2,356,222	$ 4,688,384	$ 1,005,884
21	$ -	$ 100,000	$ -	$ 146,000	$ -	$ 160,000	$ 406,000	$ 1,450,165	$ 2,986,515	$ 593,288
22	$ -	$ 99,000	$ -	$ 146,000	$ -	$ 160,000	$ 405,000	$ 1,670,201	$ 3,560,053	$ 654,838
23	$ -	$ 98,010	$ -	$ 146,000	$ -	$ 160,000	$ 404,010	$ 1,350,627	$ 2,979,638	$ 507,478
24	$ 36,950	$ 97,030	$ -	$ 146,000	$ -	$ 160,000	$ 439,980	$ 1,428,385	$ 3,261,472	$ 514,332
25	$ -	$ 96,060	$ 275,900	$ 146,000	$ 31,807	$ 160,000	$ 709,766	$ 1,620,323	$ 3,829,221	$ 559,135
26	$ -	$ 95,099	$ -	$ 146,000	$ -	$ 160,000	$ 401,099	$ 1,294,165	$ 3,165,473	$ 427,978
27	$ -	$ 94,148	$ -	$ 146,000	$ -	$ 160,000	$ 400,148	$ 1,636,072	$ 4,141,827	$ 518,502
28	$ -	$ 93,207	$ -	$ 146,000	$ -	$ 160,000	$ 399,207	$ 1,258,332	$ 3,297,047	$ 382,173
29	$ -	$ 92,274	$ -	$ 146,000	$ -	$ 160,000	$ 398,274	$ 1,240,938	$ 3,365,272	$ 361,186
30			$ -	$ 146,000	$ -	$ 160,000	$ 306,000	$ 1,192,530	$ 3,347,186	$ 332,634
	$ 775,950	$ 864,828	$ 6,897,500	$ 4,088,000	$ 3,190,034	$ 4,480,000	$ 20,297,000	$ 59,895,000	$ 95,718,000	**$ 38,534,000**

Year	Wellhead Total Capital FV	Wellhead Total O&M FV	Wellhead Total Capital NPV	Wellhead Total O&M NPV
1	$ 4,424,108	$ -	$ 4,096,396	$ -
2	$ 4,578,951	$ -	$ 3,925,713	$ -
3	$ -	$ 339,268	$ -	$ 269,322
4	$ -	$ -	$ -	$ 258,100
5	$ 365,459	$ 363,432	$ 248,725	$ 247,346
6	$ -	$ 376,152	$ -	$ 237,040
7	$ -	$ 389,317	$ -	$ 227,163
8	$ -	$ 402,944	$ -	$ 217,698
9	$ -	$ 417,047	$ -	$ 208,627
10	$ 434,051	$ 431,643	$ 201,050	$ 199,934
11	$ -	$ 446,751	$ -	$ 191,604
12	$ -	$ 462,387	$ -	$ 183,620
13	$ -	$ 478,571	$ -	$ 175,969
14	$ -	$ 495,321	$ -	$ 168,637
15	$ 515,516	$ 512,657	$ 162,512	$ 161,611
16	$ -	$ 530,600	$ -	$ 154,877
17	$ -	$ 549,171	$ -	$ 148,424
18	$ -	$ 568,392	$ -	$ 142,239
19	$ -	$ 771,113	$ -	$ 178,676
20	$ 2,082,726	$ 608,875	$ 446,845	$ 130,633
21	$ -	$ 836,129	$ -	$ 166,102
22	$ -	$ 863,262	$ -	$ 158,789
23	$ -	$ 891,292	$ -	$ 151,801
24	$ 84,369	$ 920,250	$ 13,305	$ 145,123
25	$ 727,187	$ 950,165	$ 106,182	$ 138,741
26	$ -	$ 981,072	$ -	$ 132,643
27	$ -	$ 1,013,002	$ -	$ 126,814
28	$ -	$ 1,045,990	$ -	$ 121,245
29	$ -	$ 1,080,072	$ -	$ 115,921
30	$ -	$ 858,879	$ -	$ 85,353
	$ 13,212,366	$ 17,934,893	$ 9,201,000	$ 4,844,000

	Total Capital FV	Total O&M FV	Total FV Cost	Total Capital NPV	Total O&M NPV	Total NPV Cost
1	$ 6,605,888	$ 1,454,175	$ 8,060,063	$ 6,116,563	$ 1,346,458	$ 7,463,021
2	$ 6,837,094	$ 1,505,071	$ 8,342,165	$ 5,861,706	$ 1,290,356	$ 7,152,062
3	$ -	$ 1,957,996	$ 1,957,996	$ -	$ 1,554,320	$ 1,554,320
4	$ -	$ 1,926,370	$ 1,926,370	$ -	$ 1,415,939	$ 1,415,939
5	$ 365,459	$ 1,962,041	$ 2,327,500	$ 248,725	$ 1,335,332	$ 1,584,057
6	$ -	$ 2,072,261	$ 2,072,261	$ -	$ 1,305,876	$ 1,305,876
7	$ 381,684	$ 2,035,787	$ 2,417,471	$ 222,709	$ 1,187,862	$ 1,410,571
8	$ -	$ 2,073,906	$ 2,073,906	$ -	$ 1,120,467	$ 1,120,467
9	$ -	$ 2,194,659	$ 2,194,659	$ -	$ 1,097,876	$ 1,097,876
10	$ 434,051	$ 2,152,748	$ 2,586,798	$ 201,050	$ 997,139	$ 1,198,188
11	$ -	$ 2,193,518	$ 2,193,518	$ -	$ 940,762	$ 940,762
12	$ 453,321	$ 2,325,885	$ 2,779,206	$ 180,020	$ 923,641	$ 1,103,661
13	$ -	$ 2,277,882	$ 2,277,882	$ -	$ 837,573	$ 837,573
14	$ -	$ 2,321,528	$ 2,321,528	$ -	$ 790,390	$ 790,390
15	$ 515,516	$ 2,466,706	$ 2,982,222	$ 162,512	$ 777,609	$ 940,121
16	$ -	$ 2,411,882	$ 2,411,882	$ -	$ 704,005	$ 704,005
17	$ 538,403	$ 2,458,647	$ 2,997,050	$ 145,514	$ 664,496	$ 810,010
18	$ -	$ 2,617,961	$ 2,617,961	$ -	$ 655,142	$ 655,142
19	$ -	$ 2,738,332	$ 2,738,332	$ -	$ 634,505	$ 634,505
20	$ 2,082,726	$ 2,605,658	$ 4,688,384	$ 446,845	$ 559,039	$ 1,005,884
21	$ -	$ 2,986,515	$ 2,986,515	$ -	$ 593,288	$ 593,288
22	$ 639,453	$ 2,920,600	$ 3,560,053	$ 117,621	$ 537,217	$ 654,838
23	$ -	$ 2,979,638	$ 2,979,638	$ -	$ 507,478	$ 507,478
24	$ 84,369	$ 3,177,103	$ 3,261,472	$ 13,305	$ 501,027	$ 514,332
25	$ 727,187	$ 3,102,034	$ 3,829,221	$ 106,182	$ 452,953	$ 559,135
26	$ -	$ 3,165,473	$ 3,165,473	$ -	$ 427,978	$ 427,978
27	$ 759,470	$ 3,382,357	$ 4,141,827	$ 95,076	$ 423,427	$ 518,502
28	$ -	$ 3,297,047	$ 3,297,047	$ -	$ 382,173	$ 382,173
29	$ -	$ 3,365,272	$ 3,365,272	$ -	$ 361,186	$ 361,186
30	$ -	$ 3,347,186	$ 3,347,186	$ -	$ 332,634	$ 332,634
	$ 20,425,000	**$ 75,476,000**	**$ 95,901,000**	**$ 13,918,000**	**$ 24,658,000**	**$ 38,576,000**

	Capital 20 yr FV	O&M 20 yr FV	Capital 20 yr PV	O&M 20 yr PV
	$ 12,401,000	$ 8,495,000	$ 9,081,000	$ 3,502,000

	Capital 20 yr FV	O&M 20 yr FV	Capital 20 yr PV	O&M 20 yr PV
	$ 18,214,000	$ 43,753,000		

	Capital 20 yr FV	O&M 20 yr FV	Capital 20 yr PV	O&M 20 yr PV
	$ 13,586,000	$ 20,139,000		

[1] Installation of (5) new groundwater monitoring wells; upgrades to IRM system, installation of extraction wells and diffusion wells

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (after 5 additional wells are installed)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. Extracted water from RW-400 will be tied in with discharge from RW-100 prior to conveyance to the OU2 IRM system. No upgrades to the RW-100 to OU2 IRM header will be required.
9. 500-gpm OU2 treatment plant upgrade: Upgrade 2 clearwell transfer pumps, upgrade distribution trays for air stripper; do not need to upgrade VPGAC ECUs, PPZ ECUs or IRM discharge line to existing diffusion wells
10. For new diffusion wells, tie in piping about halfway from plant to existing wells
11. O&M Costs for Upgraded Plant: Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on flow rate ratio of new higher hp to old hp
* Assume VPGAC Media Costs are increased by 100% (since flow rate will roughly double and new flow will conservatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment PPZ media will be required 20% more often due to add inflow from well RW-300/400
13. Capital Upgrades:
Years 1 and 2 - Install New Groundwater Monitoring, Extraction and Diffusion Wells
Year 2 - Install Upgrades to IRM System and Connect Piping (Design will be performed during year 1)

Table C-5. Cost Estimate for OU-2 Alternative 3a, LMC, Great Neck.

Outpost Monitoring
OU-2 IRM O&M (with 500 gpm additional flow from RW300)
Install 2 New Extraction Wells in Village of Lake Success Golf Course (VLSGC; near Lakeview Road) and in OU-1 (RW300 and EW1D)
Install Upgrades to the IRM Treatment Plant
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Wells					
1. RW300 and EW1D Extraction Well Installation	2	ea	$ 875,000	$ 1,750,000	Typ. diffusion well cost + 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Access Fee	1	ea	$ 50,000	$ 50,000	Well access fee not required for EW-1D
3. Well Permitting Fee	2	ea	$ 20,000	$ 40,000	
4. Electrical Components					
Electrical Service from Pole	1	ea	$ 50,000	$ 50,000	
Conduit/Conductors to Wells	500	ft	$ 55	$ 27,500	Includes trenching and backfilling
Pump Vault Controls and Distribution	1	ea	$ 50,000	$ 50,000	Includes MCC, disconnect, lights, power to HVAC
Electrical Supply and Control Conduits	1	ls	$ 50,000	$ 50,000	Transformer, lights, outlet, 200 ft of power conduit.
5. Electrical Installation	25%	of	$ 150,055	$ 38,000	
6. Discharge Piping from RW300 to RW100	3,200	ft	$ 175	$ 560,000	Includes double-walled 8" HDPE piping, trenching and restoration.
Subtotal				**$ 2,616,000**	
Install New Diffusion Wells					
1. Drill and install 400-gpm Diffusion Wells	2	ea	$ 700,000	$ 1,400,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc.
2. Piping Appurtenances	1	ls	$ 30,000	$ 30,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
3. Additional Design & Permitting	1	ea	$ 50,000	$ 50,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
Subtotal				**$ 1,480,000**	
Install Upgrades to OU-2 Treatment Plant (RW300)					
1. Install new 20 hp transfer pump for Clear Well 1	1	ea	$ 21,000	$ 21,000	Purchase and install pumps; upgrades to MCCs
2. Install new 50 hp transfer pump for Clear Well 2	1	ea	$ 27,000	$ 27,000	Purchase and install pumps; upgrades to MCCs
3. Install upgrade for duct heater	1	ea	$ 10,000	$ 10,000	
4. Upgrade air stripper distribution trays	2	ea	$ 15,000	$ 30,000	Per quote from Layne Christensen; assumed installation is 50% of equip. cost
Subtotal				**$ 88,000**	
Subtotal of Capital Costs				**$ 6,184,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 6,184,000	$ 309,200	
2. Construction Management (7% of capital cost)	7%	of	$ 6,184,000	$ 432,880	
3. Project Management (10% of capital cost)	10%	of	$ 6,184,000	$ 618,400	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 6,184,000	$ 927,600	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 6,184,000	$ 533,370	
Subtotal				**$ 2,821,000**	
TOTAL CAPITAL COST				**$ 9,010,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost and additional 500-gpm from RW300)					
GWTS Operations, Checklist and Inspections	1	ls	$ 320,000	$ 320,000	2010 spend
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 70,000	$ 70,000	2010 spend
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 100,000	$ 100,000	2010 spend
Extraction Well Cleaning and Redevelopment	0.67	ls	$ 190,000	$ 127,300	Increased from RAA-2a costing to reflect additional extraction well
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 360,000	$ 360,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 200,000	$ 200,000	2010 spend, adjusted for increased for additional 500 gpm from RW300
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 52,500	$ 52,500	Annualized based on change-out every 4 years, adjusted for increased flow rate
Quarterly Progress Reports to NYSDEC	1	ls	$ 35,000	$ 35,000	2010 spend
Unscheduled O&M and System Repair	1	ls	$ 150,000	$ 150,000	2010 spend
OM&M Plan Revisions and As-Builts	1	ls	$ 40,000	$ 40,000	2010 spend
Annual GWTS Performance Analysis	1	ls	$ 36,000	$ 36,000	2010 spend
Project Management	1	ls	$ 55,000	$ 55,000	2010 spend
TOTAL ANNUAL O&M COST				**$ 1,735,000**	

Table C-5. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost [1]	Monitoring Cost	OU-2 O&M Cost	OU-2 Capital Improvement	OU-2 Pre-Escalated Cost	OU-2 Escalated Cost (FV)	OU-2 NPV Cost	OU-2 Capital FV	OU-2 O&M FV	OU-2 Capital NPV	OU-2 O&M NPV
1	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 2,961,135	$ 2,741,792	$ 1,506,960	$ 1,454,175	$ 1,395,333	$ 1,346,458
2	$ 4,031,000	$ 41,000	$ 1,364,000		$ 5,436,000	$ 5,823,179	$ 4,992,438	$ 4,318,108	$ 1,505,071	$ 3,702,082	$ 1,290,356
3	$ 3,518,000	$ 96,000	$ 1,364,000		$ 4,978,000	$ 5,519,198	$ 4,381,317	$ 3,900,469	$ 1,618,728	$ 3,096,318	$ 1,284,999
4		$ 36,000	$ 1,735,000	$ -	$ 1,771,000	$ 2,032,263	$ 1,493,774	$ -	$ 2,032,263	$ -	$ 1,493,774
5		$ 36,000	$ 1,700,300	$ -	$ 1,736,300	$ 2,062,180	$ 1,403,485	$ -	$ 2,062,180	$ -	$ 1,403,485
6		$ 36,000	$ 1,668,294	$ -	$ 1,704,294	$ 2,166,309	$ 1,365,142	$ -	$ 2,166,309	$ -	$ 1,365,142
7		$ 36,000	$ 1,632,968	$ -	$ 1,668,968	$ 2,123,394	$ 1,238,980	$ -	$ 2,123,394	$ -	$ 1,238,980
8		$ 36,000	$ 1,600,309	$ 300,000	$ 1,936,309	$ 2,549,749	$ 1,377,550	$ 395,043	$ 2,154,706	$ 213,429	$ 1,164,121
9		$ 36,000	$ 1,568,303	$ -	$ 1,604,303	$ 2,268,274	$ 1,134,702	$ -	$ 2,268,274	$ -	$ 1,134,702
10		$ 36,000	$ 1,536,937	$ -	$ 1,572,937	$ 2,218,782	$ 1,027,726	$ -	$ 2,218,782	$ -	$ 1,027,726
11		$ 36,000	$ 1,506,198	$ -	$ 1,542,198	$ 2,251,562	$ 965,656	$ -	$ 2,251,562	$ -	$ 965,656
12		$ 96,000	$ 1,476,074	$ -	$ 1,572,074	$ 2,375,512	$ 943,348	$ -	$ 2,375,512	$ -	$ 943,348
13		$ 36,000	$ 1,446,552	$ 300,000	$ 1,782,552	$ 2,787,834	$ 1,025,081	$ 469,187	$ 2,318,647	$ 172,519	$ 852,562
14		$ 36,000	$ 1,417,621	$ -	$ 1,453,621	$ 2,352,969	$ 801,094	$ -	$ 2,352,969	$ -	$ 801,094
15		$ 36,000	$ 1,389,269	$ -	$ 1,485,269	$ 2,488,344	$ 784,430	$ -	$ 2,488,344	$ -	$ 784,430
16		$ 36,000	$ 1,361,484	$ -	$ 1,397,484	$ 2,423,217	$ 707,314	$ -	$ 2,423,217	$ -	$ 707,314
17		$ 36,000	$ 1,334,254	$ -	$ 1,370,254	$ 2,459,161	$ 664,635	$ -	$ 2,459,161	$ -	$ 664,635
18		$ 96,000	$ 1,307,569	$ 300,000	$ 1,703,569	$ 3,164,361	$ 791,878	$ 557,247	$ 2,607,114	$ 139,450	$ 652,428
19		$ 36,000	$ 1,281,417	$ -	$ 1,317,417	$ 2,532,737	$ 586,866	$ -	$ 2,532,737	$ -	$ 586,866
20		$ 36,000	$ 1,255,789	$ -	$ 1,291,789	$ 2,570,387	$ 551,472	$ -	$ 2,570,387	$ -	$ 551,472
21		$ 96,000	$ 1,230,673	$ -	$ 1,326,673	$ 2,732,193	$ 542,766	$ -	$ 2,732,193	$ -	$ 542,766
22		$ 36,000	$ 1,206,060	$ -	$ 1,242,060	$ 2,647,465	$ 486,976	$ -	$ 2,647,465	$ -	$ 486,976
23		$ 36,000	$ 1,181,939	$ 300,000	$ 1,517,939	$ 3,348,746	$ 570,343	$ 661,834	$ 2,686,912	$ 112,721	$ 457,622
24		$ 96,000	$ 1,158,300	$ -	$ 1,254,300	$ 2,863,979	$ 451,648	$ -	$ 2,863,979	$ -	$ 451,648
25		$ 36,000	$ 1,135,134	$ -	$ 1,171,134	$ 2,767,676	$ 404,130	$ -	$ 2,767,676	$ -	$ 404,130
26		$ 36,000	$ 1,112,431	$ -	$ 1,148,431	$ 2,809,015	$ 379,784	$ -	$ 2,809,015	$ -	$ 379,784
27		$ 96,000	$ 1,090,183	$ -	$ 1,186,183	$ 3,002,901	$ 375,924	$ -	$ 3,002,901	$ -	$ 375,924
28		$ 36,000	$ 1,068,379	$ 300,000	$ 1,404,379	$ 3,679,714	$ 426,529	$ 786,052	$ 2,893,663	$ 91,114	$ 335,415
29		$ 36,000	$ 1,047,011	$ -	$ 1,083,011	$ 2,936,995	$ 315,220	$ -	$ 2,936,995	$ -	$ 315,220
30		$ 96,000	$ 1,026,071	$ -	$ 1,122,071	$ 3,149,422	$ 312,981	$ -	$ 3,149,422	$ -	$ 312,981
	$ 7,549,000				$ 52,759,517	$ 85,069,000	$ 33,245,000	$ 12,595,000	$ 72,474,000	$ 8,923,000	$ 24,323,000

Year	N12796 & N4388 Capital Cost	N12796 & N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Welhead Pre-Escalated Cost	Welhead Escalated Cost (FV)	Welhead NPV Cost	Wellhead Capital FV	Wellhead O&M FV	Wellhead Capital NPV	Wellhead O&M NPV	Total Capital FV	Total O&M FV	Total FV	Total Capital NPV	Total O&M NPV	Total NPV
2011					$ 1,515,500		$ 1,515,500	$ 1,568,543	$ 1,452,354	$ 1,568,543	$ -	$ 1,452,354	$ -	$ 3,075,503	$ 1,454,175	$ 4,529,678	$ 2,847,688	$ 1,346,458	$ 4,194,146
2012					$ 1,515,500		$ 1,515,500	$ 1,623,441	$ 1,391,839	$ 1,623,441	$ -	$ 1,391,839	$ -	$ 5,941,549	$ 1,505,071	$ 7,446,621	$ 5,093,921	$ 1,290,356	$ 6,384,277
2013					$ -	$ 160,000	$ 177,395	$ -	$ 140,822	$ -	$ 177,395	$ -	$ 140,822	$ 3,900,469	$ 1,796,123	$ 5,696,592	$ 3,096,318	$ 1,425,820	$ 4,522,139
2014			$ 939,500		$ -	$ 160,000	$ 1,099,500	$ 1,261,702	$ 927,388	$ 1,078,098	$ 183,604	$ 792,434	$ 134,954	$ 1,078,098	$ 2,315,867	$ 3,293,965	$ 792,434	$ 1,628,728	$ 2,421,162
2015			$ 939,500		$ 31,807	$ 160,000	$ 1,131,307	$ 1,343,638	$ 914,457	$ 1,153,608	$ 190,030	$ 785,126	$ 129,331	$ 1,153,608	$ 2,252,210	$ 3,405,817	$ 785,126	$ 1,532,816	$ 2,317,942
2016			$ -	$ 71,000	$ -	$ 160,000	$ 231,000	$ 283,958	$ 178,942	$ -	$ 283,958	$ -	$ 178,942	$ -	$ 2,450,267	$ 2,450,267	$ -	$ 1,544,084	$ 1,544,084
2017			$ -	$ 69,580	$ -	$ 160,000	$ 229,580	$ 292,090	$ 170,432	$ -	$ 292,090	$ -	$ 170,432	$ -	$ 2,415,483	$ 2,415,483	$ -	$ 1,409,411	$ 1,409,411
2018			$ 93,950	$ 68,188	$ -	$ 160,000	$ 322,138	$ 424,195	$ 229,179	$ 123,714	$ 300,481	$ 66,839	$ 162,340	$ 518,757	$ 2,455,187	$ 2,973,944	$ 280,268	$ 1,326,461	$ 1,606,729
2019			$ -	$ 66,825	$ -	$ 160,000	$ 226,825	$ 309,139	$ 154,646	$ -	$ 309,139	$ -	$ 154,646	$ -	$ 2,577,412	$ 2,577,412	$ -	$ 1,289,348	$ 1,289,348
2020			$ -	$ 65,488	$ 31,807	$ 160,000	$ 257,295	$ 362,940	$ 168,111	$ 44,867	$ 318,073	$ 20,782	$ 147,329	$ 44,867	$ 2,536,856	$ 2,581,722	$ 20,782	$ 1,175,055	$ 1,195,837
2021			$ -	$ 64,178	$ -	$ 160,000	$ 224,178	$ 327,294	$ 140,371	$ -	$ 327,294	$ -	$ 140,371	$ -	$ 2,578,856	$ 2,578,856	$ -	$ 1,106,027	$ 1,106,027
2022			$ -	$ 62,895	$ -	$ 160,000	$ 222,895	$ 336,809	$ 133,752	$ -	$ 336,809	$ -	$ 133,752	$ -	$ 2,712,321	$ 2,712,321	$ -	$ 1,077,100	$ 1,077,100
2023			$ 93,950	$ 61,637	$ -	$ 160,000	$ 315,587	$ 493,564	$ 181,482	$ 146,934	$ 346,630	$ 54,027	$ 127,455	$ 616,120	$ 2,665,277	$ 3,281,398	$ 226,546	$ 980,017	$ 1,206,563
2024			$ -	$ 60,404	$ -	$ 160,000	$ 220,404	$ 356,767	$ 121,465	$ -	$ 356,767	$ -	$ 121,465	$ -	$ 2,709,736	$ 2,709,736	$ -	$ 922,560	$ 922,560
2025			$ -	$ 59,196	$ 31,807	$ 160,000	$ 251,003	$ 420,517	$ 132,565	$ 53,288	$ 367,230	$ 16,798	$ 115,766	$ 53,288	$ 2,855,573	$ 2,908,861	$ 16,798	$ 900,196	$ 916,994
2026			$ -	$ 58,012	$ -	$ 160,000	$ 218,012	$ 378,030	$ 110,343	$ -	$ 378,030	$ -	$ 110,343	$ -	$ 2,801,247	$ 2,801,247	$ -	$ 817,657	$ 817,657
2027			$ -	$ 56,852	$ -	$ 160,000	$ 216,852	$ 389,179	$ 105,183	$ -	$ 389,179	$ -	$ 105,183	$ -	$ 2,848,340	$ 2,848,340	$ -	$ 769,818	$ 769,818
2028			$ 93,950	$ 55,715	$ -	$ 160,000	$ 309,665	$ 575,199	$ 143,943	$ 174,511	$ 400,688	$ 43,671	$ 100,272	$ 731,758	$ 3,007,802	$ 3,739,560	$ 183,122	$ 752,700	$ 935,821
2029	$ 739,000		$ -	$ 54,601	$ -	$ 160,000	$ 953,601	$ 1,833,298	$ 424,797	$ 1,420,728	$ 412,570	$ 329,200	$ 95,597	$ 1,420,728	$ 2,945,307	$ 4,366,035	$ 329,200	$ 682,463	$ 1,011,663
2030	$ -	$ 100,000	$ -	$ 53,509	$ 31,807	$ 160,000	$ 345,315	$ 687,105	$ 147,417	$ 63,289	$ 623,816	$ 13,579	$ 133,839	$ 63,289	$ 3,194,203	$ 3,257,492	$ 13,579	$ 685,311	$ 698,889
2031	$ -	$ 98,000	$ -	$ 52,438	$ -	$ 160,000	$ 310,438	$ 639,327	$ 127,006	$ -	$ 639,327	$ -	$ 127,006	$ -	$ 3,371,519	$ 3,371,519	$ -	$ 669,772	$ 669,772
2032	$ -	$ 96,040	$ -	$ 51,390	$ -	$ 160,000	$ 307,430	$ 655,290	$ 120,534	$ -	$ 655,290	$ -	$ 120,534	$ -	$ 3,302,755	$ 3,302,755	$ 18,598,000	$ 49,977,000	$ 607,510	$ 607,510
2033	$ 36,950	$ 94,119	$ 93,950	$ 50,362	$ -	$ 160,000	$ 435,381	$ 960,500	$ 163,588	$ 288,780	$ 671,720	$ 49,184	$ 114,404	$ 950,615	$ 3,358,632	$ 4,309,247	$ -	$ 161,904	$ 572,026	$ 733,931
2034	$ -	$ 92,237	$ -	$ 49,355	$ -	$ 160,000	$ 301,591	$ 688,632	$ 108,597	$ -	$ 688,632	$ -	$ 108,597	$ -	$ 3,552,611	$ 3,552,611	$ -	$ -	$ 560,244	$ 560,244
2035	$ -	$ 90,392	$ -	$ 48,368	$ 31,807	$ 160,000	$ 330,566	$ 781,209	$ 114,071	$ 75,167	$ 706,042	$ 10,976	$ 103,095	$ 75,167	$ 3,473,718	$ 3,548,886	$ 10,976	$ 507,225	$ 518,201
2036	$ -	$ 88,584	$ -	$ 47,400	$ -	$ 160,000	$ 295,984	$ 723,966	$ 97,881	$ -	$ 723,966	$ -	$ 97,881	$ -	$ 3,532,981	$ 3,532,981	$ -	$ 477,665	$ 477,665
2037	$ -	$ 86,813	$ -	$ 46,452	$ -	$ 160,000	$ 293,265	$ 742,419	$ 92,941	$ -	$ 742,419	$ -	$ 92,941	$ -	$ 3,745,320	$ 3,745,320	$ -	$ 468,865	$ 468,865
2038	$ 36,950	$ 85,076	$ 93,950	$ 45,523	$ -	$ 160,000	$ 421,499	$ 1,104,401	$ 128,015	$ 342,981	$ 761,420	$ 39,756	$ 88,259	$ 1,129,032	$ 3,655,083	$ 4,784,115	$ 130,870	$ 423,674	$ 554,545
2039	$ -	$ 83,375	$ -	$ 44,613	$ -	$ 160,000	$ 287,987	$ 780,987	$ 83,821	$ -	$ 780,987	$ -	$ 83,821	$ -	$ 3,717,981	$ 3,717,981	$ -	$ 399,042	$ 399,042
2040	$ -	$ 81,707	$ -	$ 43,720	$ -	$ 160,000	$ 285,428	$ 801,137	$ 79,615	$ -	$ 801,137	$ -	$ 79,615	$ -	$ 3,950,559	$ 3,950,559	$ -	$ 392,596	$ 392,596
	$ 812,900	$ 996,343	$ 2,348,750	$ 1,407,700	$ 3,190,034	$ 4,480,000	$ 13,236,000	$ 21,323,000	$ 8,486,000	$ 8,158,000	$ 13,165,000	$ 5,067,000	$ 3,419,000	$ 20,753,000	$ 85,638,000	$ 106,391,000	$ 13,990,000	$ 27,741,000	$ 41,731,000

[1] Installation of (5) new groundwater monitoring wells; upgrades to IRM system, installation of extraction wells and diffusion wells

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (after 5 additional wells are installed)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. Extracted water from RW-400 will be tied in with discharge from RW-100 prior to conveyance to the OU2 IRM system. No upgrades to the RW-100 to OU2 IRM header will be required.
9. 500-gpm OU2 treatment plant upgrade: Upgrade 2 clearwell transfer pumps, upgrade distribution trays for air stripper; do not need to upgrade VPGAC ECUs, PPZ ECUs or IRM discharge line to existing diffusion wells
10. For new diffusion wells, tie in piping about halfway from plant to existing wells
11. O&M Costs for Upgraded Plant: Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on flow rate ratio of new higher hp to old hp
* Assume VPGAC Media Costs are increased by 100% (since flow rate will roughly double and new flow will conservatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment PPZ media will be required 20% more often due to add inflow from well RW-300/400
13. Capital Upgrades:
Years 1 and 2 - Install New Groundwater Monitoring, Extraction and Diffusion Wells
Year 2 - Install Upgrades to IRM System and Connect Piping (Design will be performed during year 1)

	20 yr FV	*20 yr FV*
Capital	*$ 18,598,000*	*$ 49,977,000*
O&M		

Table C-6. Cost Estimate for OU-2 Alternative 3b, LMC, Great Neck.
Outpost Monitoring
OU-2 IRM O&M (30 years)
Install 2 New Extraction Wells at VLSGC (near Lakeview Road) and in OU-1 (RW300 and EW1D)
Install 2 New Diffusion Wells in VLSGC (DW300 and DW301)
Install New 500-gpm Treatment Plant near RW300
New 500-gpm Treatment Plant O&M
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Wells (RW300 and EW1D)					
1. RW300 and EW1D Extraction Well Installation	2	ea	$ 875,000	$ 1,750,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing Basis: Diffusion Well Installation Costs per ARCADIS Principal Sci. rec'd
2. Well Access Fee	1	ea	$ 50,000	$ 50,000	Well access fee not required for EW1D
3. Well Permitting Fee	2	ea	$ 20,000	$ 40,000	
Subtotal				**$ 1,840,000**	
Install New Diffusion Wells (DW300 and DW301)					
1. Drill and install 400-gpm Diffusion Wells	2	ea	$ 700,000	$ 1,400,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc.
2. Discharge Piping	5,000	ft	$ 85	$ 425,000	Single-wall, 8" Blue Brute HDPE piping, trenching, and restoration. Est. from previous
3. Piping Appurtenances	1	ls	$ 30,000	$ 30,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
4. Additional Design & Permitting	1	ea	$ 50,000	$ 50,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	1	ea	$ 50,000	$ 50,000	
Subtotal				**$ 1,955,000**	
Install Treatment Plant for RW300					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	1	ls	$ 150,000	$ 150,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	1	ea	$ 75,000	$ 75,000	Foundation (incl. clearwells)
Building	3,000	lf	$ 250	$ 750,000	Cost based on RTKL architect's estimate
HVAC	1	ea	$ 20,000	$ 20,000	
Soil transport.	1,000	cy	$ 6.62	$ 6,623	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 50,000	$ 50,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 226,000	$ 226,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 372,000	$ 372,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in
Horizontal Mist Eliminator and Knock-Out Tank	1	ea	$ 11,000	$ 11,000	
Duct Heater	1	ea	$ 24,000	$ 24,000	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	2	ea	$ 21,000	$ 42,000	Assumes two 20 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 75,000	$ 75,000	Bag Filter System.
Ducting	1	ls	$ 169,000	$ 169,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 27,000	$ 54,000	50 Hp pump. Est. from experience.
Blower	1	ea	$ 32,000	$ 32,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation) plus installation.
4. Mechanical Components					
Piping from Extraction Well to Treatment Plant	300	ft	$ 175	$ 52,500	Includes double-walled 8" HDPE piping, trenching and restoration.
Extraction Well Piping Leak Detection System	300	ft	$ 25	$ 7,500	
Process Piping	1	ls	$ 115,000	$ 115,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 75,000	$ 75,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	1	ea	$ 90,000	$ 90,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	300	ft	$ 35	$ 10,500	
Building Controls and Distribution	1	ea	$ 95,000	$ 95,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 95,000	$ 95,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 1,255,000	$ 1,260,000	
8. Electrical Installation	25%	of	$ 325,500	$ 81,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 10,000	$ 10,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 4,083,000**	
Subtotal of Capital Cost				**$ 9,878,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5.0%	of	$ 9,878,000	$ 493,900	
2. Construction Management (7% of capital cost)	7.0%	of	$ 9,878,000	$ 691,460	
3. Project Management (10% of capital cost)	10.0%	of	$ 9,878,000	$ 987,800	
4. Construction Contingency (Union Labor; 15% of capital cost)	15.0%	of	$ 9,878,000	$ 1,481,700	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 9,878,000	$ 851,978	
Subtotal				**$ 4,507,000**	
TOTAL CAPITAL COST				**$ 14,400,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a estiimate
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 500-gpm RW400 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a estiimate
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 2,380,000**	

Table C-6. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost	Monitoring Cost	OU-2 O&M Cost	OU-2 Capital Improvements	OU-2 Pre-Escalated Cost	OU-2 Escalated Cost (FV)	OU-2 PV (Cost)	OU-2 Total Capital FV	OU-2 Total O&M FV	OU-2 Total Capital PV	OU-2 Total O&M PV
1	$ 6,364,000	$ 41,000	$ 1,364,000		$ 7,769,000	$ 8,040,915	$ 7,445,292	$ 6,586,740	$ 1,454,175	$ 6,098,833	$ 1,346,458
2	$ 5,049,000	$ 41,000	$ 1,364,000		$ 6,454,000	$ 6,913,686	$ 5,927,372	$ 5,408,615	$ 1,505,071	$ 4,637,016	$ 1,290,356
3	$ 2,973,000	$ 41,000	$ 1,364,000		$ 4,433,000	$ 4,914,946	$ 3,901,643	$ 3,296,218	$ 1,618,728	$ 2,616,644	$ 1,284,999
4		$ 36,000	$ 2,380,000	$ -	$ 2,416,000	$ 2,772,416	$ 2,037,808	$ -	$ 2,772,416	$ -	$ 2,037,808
5		$ 36,000	$ 2,332,400	$ -	$ 2,368,400	$ 2,812,916	$ 1,914,424	$ -	$ 2,812,916	$ -	$ 1,914,424
6		$ 36,000	$ 2,285,752	$ -	$ 2,321,752	$ 2,907,781	$ 1,844,999	$ -	$ 2,907,781	$ -	$ 1,844,999
7		$ 36,000	$ 2,240,037	$ -	$ 2,276,037	$ 2,895,755	$ 1,689,645	$ -	$ 2,895,755	$ -	$ 1,689,645
8		$ 36,000	$ 2,195,236	$ 600,000	$ 2,831,236	$ 3,728,197	$ 2,014,229	$ 790,085	$ 2,938,112	$ 426,859	$ 1,587,371
9		$ 36,000	$ 2,151,331	$ -	$ 2,247,331	$ 3,062,882	$ 1,532,204	$ -	$ 3,062,882	$ -	$ 1,532,204
10		$ 36,000	$ 2,108,305	$ -	$ 2,144,305	$ 3,024,754	$ 1,401,046	$ -	$ 3,024,754	$ -	$ 1,401,046
11		$ 36,000	$ 2,066,139	$ -	$ 2,102,139	$ 3,069,059	$ 1,316,267	$ -	$ 3,069,059	$ -	$ 1,316,267
12		$ 36,000	$ 2,024,816	$ -	$ 2,060,816	$ 3,204,099	$ 1,272,630	$ -	$ 3,204,099	$ -	$ 1,272,630
13		$ 36,000	$ 1,984,320	$ 600,000	$ 2,620,320	$ 4,098,065	$ 1,506,850	$ 938,374	$ 3,159,691	$ 345,038	$ 1,161,812
14		$ 36,000	$ 1,944,633	$ -	$ 1,980,633	$ 3,206,040	$ 1,091,532	$ -	$ 3,206,040	$ -	$ 1,091,532
15		$ 36,000	$ 1,905,741	$ -	$ 2,001,741	$ 3,353,614	$ 1,057,199	$ -	$ 3,353,614	$ -	$ 1,057,199
16		$ 36,000	$ 1,867,626	$ -	$ 1,903,626	$ 3,300,861	$ 963,490	$ -	$ 3,300,861	$ -	$ 963,490
17		$ 36,000	$ 1,830,273	$ -	$ 1,866,273	$ 3,349,355	$ 905,227	$ -	$ 3,349,355	$ -	$ 905,227
18		$ 36,000	$ 1,793,668	$ 600,000	$ 2,489,668	$ 4,624,531	$ 1,157,284	$ 1,114,494	$ 3,510,038	$ 278,901	$ 878,383
19		$ 36,000	$ 1,757,794	$ -	$ 1,793,794	$ 3,448,572	$ 799,076	$ -	$ 3,448,572	$ -	$ 799,076
20		$ 36,000	$ 1,722,639	$ -	$ 1,758,639	$ 3,499,319	$ 750,773	$ -	$ 3,499,319	$ -	$ 750,773
21		$ 36,000	$ 1,688,186	$ -	$ 1,784,186	$ 3,674,408	$ 729,942	$ -	$ 3,674,408	$ -	$ 729,942
22		$ 36,000	$ 1,654,422	$ -	$ 1,690,422	$ 3,603,154	$ 662,766	$ -	$ 3,603,154	$ -	$ 662,766
23		$ 36,000	$ 1,621,334	$ 600,000	$ 2,257,334	$ 4,979,936	$ 848,159	$ 1,323,669	$ 3,656,268	$ 225,441	$ 622,718
24		$ 36,000	$ 1,588,907	$ -	$ 1,684,907	$ 3,847,196	$ 686,700	$ -	$ 3,847,196	$ -	$ 686,700
25		$ 36,000	$ 1,557,129	$ -	$ 1,593,129	$ 3,764,954	$ 549,751	$ -	$ 3,764,954	$ -	$ 549,751
26		$ 36,000	$ 1,525,986	$ -	$ 1,561,986	$ 3,820,554	$ 516,546	$ -	$ 3,820,554	$ -	$ 516,546
27		$ 36,000	$ 1,495,467	$ -	$ 1,591,467	$ 4,028,904	$ 504,366	$ -	$ 4,028,904	$ -	$ 504,366
28		$ 36,000	$ 1,465,557	$ 600,000	$ 2,101,557	$ 5,506,441	$ 638,272	$ 1,572,103	$ 3,934,338	$ 182,228	$ 456,044
29		$ 36,000	$ 1,436,246	$ -	$ 1,472,246	$ 3,992,552	$ 428,511	$ -	$ 3,992,552	$ -	$ 428,511
30		$ 36,000	$ 1,407,521	$ -	$ 1,503,521	$ 4,220,074	$ 419,380	$ -	$ 4,220,074	$ -	$ 419,380
	$ 14,386,000			$ 3,000,000	$ 73,199,464	$ 117,686,537	**$ 46,433,000**	$ 21,030,000	$ 96,656,000	$ 14,811,000	$ 31,622,000

Year	N12796 & Capital Cost	N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Wellhead Pre-Escalated Cost	Total Pre-Escalated Cost	Total Escalated Cost (FV)	Total PV (Cost)	Wellhead Total Capital FV	Wellhead Total O&M FV	Wellhead Total Capital PV	Wellhead Total O&M PV	Wellhead Total FV	Total Capital FV	Total O&M FV	Total FV	Total Capital NPV	Total O&M NPV	Total NPV
2011	1				$ 1,515,500		$ 1,515,500	$ 9,284,500	$ 9,609,458	$ 8,897,646	$ 1,568,543	$ -	$ 1,452,354	$ -	$ 1,452,354	$ 8,155,283	$ 1,454,175	$ 9,609,458	$ 7,551,188	$ 1,346,458	$ 8,897,646
2012	2				$ 1,515,500		$ 1,515,500	$ 7,969,500	$ 8,537,128	$ 7,319,211	$ 1,623,441	$ -	$ 1,391,839	$ -	$ 1,391,839	$ 7,032,057	$ 1,505,071	$ 8,537,128	$ 6,028,855	$ 1,290,356	$ 7,319,211
2013	3						$ 160,000	$ 4,593,000	$ 5,092,341	$ 4,042,465	$ -	$ 177,395	$ -	$ 140,822	$ 140,822	$ 3,296,218	$ 1,796,123	$ 5,092,341	$ 2,616,644	$ 1,425,820	$ 4,042,465
2014	4		$ 939,500				$ 160,000	$ 1,099,500	$ 4,034,117	$ 2,965,197	$ 1,078,098	$ 183,604	$ 792,434	$ 134,954	$ 927,388	$ 1,078,098	$ 2,956,019	$ 4,034,117	$ 792,434	$ 2,172,762	$ 2,965,197
2015	5		$ 939,500		$ 31,807	$ -	$ 160,000	$ 1,131,307	$ 3,499,707	$ 2,626,881	$ 1,153,608	$ 190,030	$ 785,126	$ 129,331	$ 914,457	$ 1,153,608	$ 3,002,946	$ 4,156,554	$ 785,126	$ 2,043,755	$ 2,828,881
2016	6			$ 71,000	$ -	$ -	$ 231,000	$ 2,612,752	$ 3,211,739	$ 2,023,941	$ -	$ 283,958	$ -	$ 178,942	$ 178,942	$ -	$ 3,211,739	$ 3,211,739	$ -	$ 2,023,941	$ 2,023,941
2017	7			$ 69,580	$ -	$ -	$ 160,000	$ 229,580	$ 2,505,617	$ 3,187,844	$ 1,860,077	$ -	$ -	$ 170,432	$ 170,432	$ -	$ 292,090	$ 292,090	$ -	$ 1,860,077	$ 1,860,077
2018	8		$ 93,950	$ 68,188	$ -	$ -	$ 160,000	$ 322,138	$ 3,153,375	$ 4,152,292	$ 2,243,498	$ 123,714	$ 913,800	$ 66,839	$ 162,340	$ 229,179	$ 300,481	$ 3,238,593	$ 4,152,292	$ 493,698	$ 1,742,711	$ 2,243,498
2019	9		$ -	$ 66,825	$ -	$ -	$ 160,000	$ 226,825	$ 2,474,156	$ 3,372,021	$ 1,686,850	$ -	$ -	$ -	$ -	$ -	$ 309,139	$ 3,372,021	$ 1,686,850	$ -	$ 1,686,850	$ 1,686,850
2020	10		$ -	$ 65,488	$ 31,807	$ -	$ 160,000	$ 257,295	$ 2,401,600	$ 3,387,694	$ 1,569,158	$ 44,867	$ 318,073	$ -	$ 318,073	$ 44,867	$ 3,342,827	$ 3,387,694	$ 20,782	$ 1,548,376	$ 1,569,158
2021	11		$ -	$ 64,178	$ -	$ -	$ 160,000	$ 224,178	$ 2,326,317	$ 3,396,353	$ 1,456,637	$ -	$ 327,294	$ -	$ 327,294	$ -	$ 3,396,353	$ 3,396,353	$ -	$ 1,456,637	$ 1,456,637
2022	12		$ -	$ 62,895	$ -	$ -	$ 160,000	$ 222,895	$ 2,343,711	$ 3,541,508	$ 1,406,382	$ -	$ 337,152	$ -	$ 337,152	$ -	$ 3,541,508	$ 3,541,508	$ -	$ 1,406,382	$ 1,406,382
2023	13		$ 93,950	$ 61,637	$ -	$ -	$ 160,000	$ 315,587	$ 2,935,907	$ 4,591,629	$ 1,688,332	$ 146,934	$ 346,630	$ -	$ 346,630	$ -	$ 3,506,322	$ 4,591,629	$ 399,065	$ 1,289,267	$ 1,688,332
2024	14		$ -	$ 60,404	$ -	$ -	$ 160,000	$ 220,404	$ 2,201,037	$ 3,562,807	$ 1,212,997	$ -	$ 356,767	$ -	$ 356,767	$ -	$ 3,562,807	$ 3,562,807	$ -	$ 1,212,997	$ 1,212,997
2025	15		$ -	$ 59,196	$ 31,807	$ -	$ 160,000	$ 251,003	$ 2,252,744	$ 3,774,131	$ 1,189,764	$ 53,288	$ 367,230	$ -	$ 367,230	$ 53,288	$ 3,720,844	$ 3,774,131	$ 16,798	$ 1,172,965	$ 1,189,764
2026	16		$ -	$ 58,012	$ -	$ -	$ 160,000	$ 218,012	$ 2,121,638	$ 3,678,891	$ 1,073,833	$ -	$ 378,030	$ -	$ 378,030	$ -	$ 3,678,891	$ 3,678,891	$ -	$ 1,073,833	$ 1,073,833
2027	17	$ 739,000		$ 56,852	$ -	$ -	$ 160,000	$ 955,852	$ 2,822,125	$ 5,064,799	$ 1,368,858	$ 1,326,265	$ 389,179	$ -	$ 358,448	$ 105,183	$ 463,631	$ 1,326,265	$ 3,738,534	$ 5,064,799	$ 358,448	$ 1,010,410	$ 1,368,858
2028	18	$ -	$ 100,000	$ 93,950	$ 55,715	$ -	$ 160,000	$ 409,665	$ 2,899,333	$ 5,385,479	$ 1,347,711	$ 174,511	$ 586,437	*Capital*	*O&M*	$ 43,671	$ 146,753	$ 190,427	*Capital*	*O&M*	$ 1,289,005	$ 4,096,475	$ 5,385,479	*Capital*	*O&M*	$ 322,572	$ 1,025,139	$ 1,347,711	*Capital*	*O&M*
2029	19	$ -	$ 98,000	$ -	$ 54,601	$ -	$ 160,000	$ 312,601	$ 2,106,395	$ 4,049,547	$ 938,329	$ -	$ 600,975	*20 yr FV*	*20 yr FV*	$ -	$ 139,253	$ 139,253	*20 yr PV*	*20 yr PV*	$ -	$ 4,049,547	$ 4,049,547	*20 yr FV*	*20 yr FV*	$ -	$ 938,329	$ 938,329	*20 yr PV*	*20 yr PV*
2030	20	$ -	$ 96,040	$ -	$ 53,509	$ 31,807	$ 160,000	$ 341,355	$ 2,099,994	$ 4,178,545	$ 896,499	$ 63,289	$ 615,936	**$ 7,357,000**	**$ 6,360,000**	$ 13,579	$ 132,148	$ 145,727	**$ 4,996,000**	**$ 2,491,000**	$ 63,289	$ 4,115,256	$ 4,178,545	**$ 25,491,000**	**$ 64,474,000**	$ 13,579	$ 882,921	$ 896,499	**$ 19,399,000**	**$ 28,617,000**
2031	21	$ 36,950	$ 94,119	$ -	$ 52,438	$ -	$ 160,000	$ 343,508	$ 2,127,693	$ 4,381,839	$ 870,477	$ 76,096	$ 631,334			$ 15,117	$ 125,418	$ 140,535			$ 76,096	$ 4,305,743	$ 4,381,839			$ 15,117	$ 855,361	$ 870,477		
2032	22	$ -	$ 92,237	$ -	$ 51,390	$ -	$ 160,000	$ 303,626	$ 1,994,049	$ 4,250,338	$ 781,809	$ -	$ 647,183			$ -	$ 119,043	$ 119,043			$ -	$ 4,250,338	$ 4,250,338			$ -	$ 781,809	$ 781,809		
2033	23	$ -	$ 90,392	$ 93,950	$ 50,362	$ -	$ 160,000	$ 394,704	$ 2,652,038	$ 5,850,698	$ 996,463	$ 207,264	$ 663,498			$ 35,300	$ 113,004	$ 148,304			$ 1,530,933	$ 4,319,765	$ 5,850,698			$ 260,741	$ 735,722	$ 996,463		
2034	24	$ -	$ 88,584	$ -	$ 49,355	$ -	$ 160,000	$ 297,939	$ 1,982,846	$ 4,527,488	$ 713,982	$ -	$ 680,292			$ -	$ 107,282	$ 107,282			$ -	$ 4,527,488	$ 4,527,488			$ -	$ 713,982	$ 713,982		
2035	25	$ -	$ 86,813	$ -	$ 48,368	$ 31,807	$ 160,000	$ 326,987	$ 1,920,116	$ 4,537,704	$ 662,586	$ 75,167	$ 697,583			$ 10,976	$ 101,860	$ 112,835			$ 75,167	$ 4,462,537	$ 4,537,704			$ 10,976	$ 651,610	$ 662,586		
2036	26	$ 36,950	$ 85,076	$ -	$ 47,400	$ -	$ 160,000	$ 329,426	$ 1,891,413	$ 4,626,317	$ 625,486	$ 90,378	$ 715,385			$ 12,219	$ 96,721	$ 108,941			$ 90,378	$ 4,535,939	$ 4,626,317			$ 12,219	$ 613,267	$ 625,486		
2037	27	$ -	$ 83,375	$ -	$ 46,452	$ -	$ 160,000	$ 289,827	$ 1,881,293	$ 4,762,621	$ 596,217	$ -	$ 733,716			$ -	$ 91,852	$ 91,852			$ -	$ 4,762,621	$ 4,762,621			$ -	$ 596,217	$ 596,217		
2038	28	$ -	$ 81,707	$ 93,950	$ 45,523	$ -	$ 160,000	$ 381,180	$ 2,482,738	$ 6,505,199	$ 754,042	$ 246,165	$ 752,593			$ 28,534	$ 87,236	$ 115,770			$ 1,818,268	$ 4,686,931	$ 6,505,199			$ 210,762	$ 543,280	$ 754,042		
2039	29	$ -	$ 80,073	$ -	$ 44,613	$ -	$ 160,000	$ 284,686	$ 1,756,932	$ 4,764,585	$ 511,371	$ -	$ 772,033			$ -	$ 82,860	$ 82,860			$ -	$ 4,764,585	$ 4,764,585			$ -	$ 511,371	$ 511,371		
2040	30	$ -	$ 78,472	$ -	$ 43,720	$ -	$ 160,000	$ 282,192	$ 1,785,713	$ 5,012,129	$ 498,092	$ -	$ 792,055			$ -	$ 78,712	$ 78,712			$ -	$ 5,012,129	$ 5,012,129			$ -	$ 498,092	$ 498,092		
	$ 812,900	$ 1,154,888	$ 2,348,750	$ 1,407,700	$ 3,190,034	$ 4,480,000	$ 13,395,000	$ 86,594,000	**$ 139,184,000**	**$ 55,027,000**	$ 8,052,000	$ 13,446,000	$ 5,098,000	$ 3,495,000	$ 8,593,000	$ 29,082,000	$ 110,102,000	**$ 139,184,000**	$ 19,909,000	$ 35,118,000	**$ 55,027,000**

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (after 5 additional wells are installed)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds: sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. 30 years O&M for OU-2 IRM
9. 30 years O&M for RW-400 Plant (O&M costs are equivalent to 2008 OU2 IRM budgeted costs)
10. 2 diffusion wells for RW-400 Plant located at west end of VLSGC
11. Extraction well located at east side of VLSGC
12. Fresh VC offgas treatment media (PPE) will be required every 5 years in the IRM system and every 10 years in the RW-300/-400 system
13. Capital Costs:
Years 1 and 2 - Install New Groundwater Monitoring, Extraction and Diffusion Wells
Year 2 - Install Piping and Begin Treatment Plant Installation (Design will be performed during year 1)
Year 3 - Complete Treatment Plant Installation

NOTE:
If substituting installation of RW-300 for RW-400, a double-walled PVC pipe will need to be run across the VLSGC.
This pipe would be approximately 3,200 feet. The cost for this pipe would be $560,000 in today's dollars.
O&M costs (e.g., power) may increase slightly due to the increased transport distance of the water.

Table C-7. Cost Estimate for OU-2 Alternative 4a, LMC, Great Neck.

Outpost Monitoring
OU-2 IRM O&M
Install 3 New Extraction Wells at Manhasset Lakeville Water District (MLWD) and in OU-1 (RW400BM, RW400BM, and EW1D)
Install 5 New Diffusion Wells at Fresh Meadow Country Club (FMCC; DW400, DW401, and DW402a through DW402c)
Install New 1,200-gpm Treatment Plant at MLWD
30 Years of O&M of New Treatment Plant
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Wells					
1. RW400BM, RW400MM, and EW1D Extraction Well Installation	3	ea	$ 875,000	$ 2,625,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Access Fee	1	ea	$ 50,000	$ 50,000	Well access fee not required for EW-1D
3. Well Permitting Fee	3	ea	$ 20,000	$ 60,000	
4. Discharge Piping from RW400 to Treatment Plant	800	ft	$ 175	$ 140,000	Includes double-walled 8" PVC piping, trenching and restoration.
Subtotal				**$ 2,875,000**	
Install New Diffusion Wells (4)					
1. Drill and install diffusion wells	4	ea	$ 700,000	$ 2,800,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc. Bid
2. Discharge Piping from Plant	6,000	ft	$ 85	$ 510,000	Single-wall, 8" Blue Brute HDPE piping, trenching, and restoration. Est. from pervious ARCADIS FS cost estimates with inflation.
3. Piping Appurtenances	1	ls	$ 30,000	$ 30,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
4. Additional Design & Permitting	1	ea	$ 50,000	$ 50,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	1	ea	$ 50,000	$ 50,000	
Subtotal				**$ 3,390,000**	
Install 1,200-gpm Treatment Plant for RW400BM and RW400MM					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	0.25	ea	$ 200,000	$ 50,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	0.5	ea	$ 100,000	$ 50,000	Foundation (incl. clearwells)
Building	4,600	sf	$ 250	$ 1,150,000	Cost based on RTKL architect's estimate
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	625	cy	$ 6.62	$ 4,139	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 350,000	$ 350,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 372,000	$ 372,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in same
Horizontal Mist Eliminator and Knock-Out Tank	1	ea	$ 11,000	$ 11,000	
Duct Heater	1	ea	$ 37,000	$ 37,000	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	2	ea	$ 27,000	$ 54,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 116,000	$ 116,000	Bag Filter System.
Ducting	1	ls	$ 225,000	$ 225,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 27,000	$ 54,000	50 Hp pump. Est. from experience.
Blower	1	ea	$ 50,000	$ 50,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation)
4. Mechanical Components					
Extraction Well Piping Leak Detection System	800	ft	$ 25	$ 20,000	
Process Piping	1	ls	$ 175,000	$ 175,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 120,000	$ 120,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	0.5	ea	$ 90,000	$ 45,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	800	ft	$ 35	$ 28,000	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 1,584,000	$ 1,580,000	
8. Electrical Installation	25%	of	$ 338,000	$ 85,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 5,047,000**	
Subtotal of Capital Costs				**$ 13,312,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 13,312,000	$ 665,600	
2. Construction Management (7% of capital cost)	7%	of	$ 13,312,000	$ 931,840	
3. Project Management (10% of capital cost)	10%	of	$ 13,312,000	$ 1,331,200	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 13,312,000	$ 1,996,800	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 13,312,000	$ 1,148,160	
Subtotal				$ 6,074,000	
TOTAL CAPITAL COST				**$ 19,400,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 1,200-gpm RW400 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.67	ls	$ 190,000	$ 127,300	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.67	ls	$ 210,000	$ 140,700	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 432,000	$ 432,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 240,000	$ 240,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 217,500	$ 217,500	2010 spend for OU-2, increased by 45% for 1,200-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 3,010,000**	

Table C-7. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost [1]	Monitoring Cost	OU2 O&M Cost	OU2 Capital Improvements	Pre-Escalated Cost	Escalated Cost (FV)	OU2 PV (Cost)	OU2 Capital PV	OU2 O&M FV	OU2 Capital PV	OU2 O&M NPV
1	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 2,961,135	$ 2,741,792	$ 1,506,960	$ 1,454,175	$ 1,395,333	$ 1,346,458
2	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 3,064,775	$ 2,627,550	$ 1,559,704	$ 1,505,071	$ 1,337,194	$ 1,290,356
3	$ 3,615,000	$ 96,000	$ 1,364,000		$ 5,075,000	$ 5,626,743	$ 4,466,690	$ 4,008,015	$ 1,618,728	$ 3,181,692	$ 1,284,999
4	$ 8,710,000	$ 36,000	$ 3,010,000		$ 11,756,000	$ 13,490,280	$ 9,915,759	$ 9,994,925	$ 3,495,355	$ 7,346,568	$ 2,569,190
5	$ 4,149,000	$ 36,000	$ 2,949,800		$ 7,134,800	$ 8,473,904	$ 5,767,197	$ 4,927,710	$ 3,546,194	$ 3,353,717	$ 2,413,480
6		$ 96,000	$ 2,890,804	$ -	$ 2,986,804	$ 3,671,545	$ 2,313,696	$ -	$ 3,671,545	$ -	$ 2,313,696
7		$ 36,000	$ 2,832,988	$ -	$ 2,868,988	$ 3,650,154	$ 2,129,830	$ -	$ 3,650,154	$ -	$ 2,129,830
8		$ 36,000	$ 2,776,328	$ -	$ 2,812,328	$ 3,703,299	$ 2,000,777	$ -	$ 3,703,299	$ -	$ 2,000,777
9		$ 96,000	$ 2,720,802	$ -	$ 2,816,802	$ 3,839,011	$ 1,920,462	$ -	$ 3,839,011	$ -	$ 1,920,462
10		$ 36,000	$ 2,666,386	$ 600,000	$ 3,302,386	$ 4,658,341	$ 2,157,713	$ 846,359	$ 3,811,982	$ 392,028	$ 1,765,685
11		$ 36,000	$ 2,613,058	$ -	$ 2,649,058	$ 3,867,544	$ 1,658,723	$ -	$ 3,867,544	$ -	$ 1,658,723
12		$ 96,000	$ 2,560,797	$ -	$ 2,656,797	$ 4,014,602	$ 1,594,254	$ -	$ 4,014,602	$ -	$ 1,594,254
13		$ 36,000	$ 2,509,581	$ -	$ 2,545,581	$ 3,981,176	$ 1,463,870	$ -	$ 3,981,176	$ -	$ 1,463,870
14		$ 36,000	$ 2,459,389	$ -	$ 2,495,389	$ 4,039,273	$ 1,375,215	$ -	$ 4,039,273	$ -	$ 1,375,215
15		$ 96,000	$ 2,410,201	$ 600,000	$ 3,106,201	$ 5,203,971	$ 1,640,509	$ 1,005,209	$ 4,198,762	$ 316,884	$ 1,323,625
16		$ 36,000	$ 2,361,997	$ -	$ 2,397,997	$ 4,158,094	$ 1,213,708	$ -	$ 4,158,094	$ -	$ 1,213,708
17		$ 36,000	$ 2,314,757	$ -	$ 2,350,757	$ 4,218,847	$ 1,140,223	$ -	$ 4,218,847	$ -	$ 1,140,223
18		$ 96,000	$ 2,268,462	$ -	$ 2,364,462	$ 4,391,963	$ 1,099,084	$ -	$ 4,391,963	$ -	$ 1,099,084
19		$ 36,000	$ 2,223,093	$ -	$ 2,259,093	$ 4,343,109	$ 1,006,351	$ -	$ 4,343,109	$ -	$ 1,006,351
20		$ 36,000	$ 2,178,631	$ 600,000	$ 2,814,631	$ 5,600,522	$ 1,201,582	$ 1,193,873	$ 4,406,648	$ 256,143	$ 945,439
21		$ 96,000	$ 2,135,059	$ -	$ 2,231,059	$ 4,594,712	$ 912,766	$ -	$ 4,594,712	$ -	$ 912,766
22		$ 36,000	$ 2,092,357	$ -	$ 2,128,357	$ 4,536,618	$ 834,468	$ -	$ 4,536,618	$ -	$ 834,468
23		$ 36,000	$ 2,050,510	$ -	$ 2,086,510	$ 4,603,080	$ 783,975	$ -	$ 4,603,080	$ -	$ 783,975
24		$ 96,000	$ 2,009,500	$ -	$ 2,105,500	$ 4,807,548	$ 758,147	$ -	$ 4,807,548	$ -	$ 758,147
25		$ 36,000	$ 1,969,310	$ 600,000	$ 2,605,310	$ 6,156,986	$ 899,030	$ 1,417,947	$ 4,739,039	$ 207,046	$ 691,985
26		$ 36,000	$ 1,929,924	$ -	$ 1,965,924	$ 4,808,568	$ 650,127	$ -	$ 4,808,568	$ -	$ 650,127
27		$ 96,000	$ 1,891,325	$ -	$ 1,987,325	$ 5,031,047	$ 629,821	$ -	$ 5,031,047	$ -	$ 629,821
28		$ 36,000	$ 1,853,499	$ -	$ 1,889,499	$ 4,950,812	$ 573,867	$ -	$ 4,950,812	$ -	$ 573,867
29		$ 36,000	$ 1,816,429	$ -	$ 1,852,429	$ 5,023,561	$ 539,166	$ -	$ 5,023,561	$ -	$ 539,166
30		$ 96,000	$ 1,780,100	$ -	$ 1,876,100	$ 5,265,826	$ 523,304	$ -	$ 5,265,826	$ -	$ 523,304
	$ 19,386,000			$ 2,400,000	$ 90,843,087	$ 146,737,048	**$ 56,540,000**	$ 26,461,000	$ 120,276,000	$ 17,800,000	$ 38,800,000

Year	N12796 & N4388 Capital Cost	N12796 & N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Wellhead Pre-Escalated Cost	Grand Total Pre-Escalated Cost	Grand Total Escalated Cost (FV)	Grand Total PV (Cost)
1					$ 1,515,500		$ 1,515,500	$ 4,376,500	$ 4,529,678	$ 4,194,146
2					$ 1,515,500		$ 1,515,500	$ 4,376,500	$ 4,688,216	$ 4,019,390
3					$ -	$ 160,000	$ 160,000	$ 5,235,000	$ 5,804,138	$ 4,607,512
4			$ 939,500		$ -	$ 160,000	$ 1,099,500	$ 12,855,500	$ 14,751,982	$ 10,843,147
5			$ 939,500		$ 31,807	$ 160,000	$ 1,131,307	$ 8,266,107	$ 9,817,542	$ 6,681,654
6			$ -	$ 71,000	$ -	$ 160,000	$ 231,000	$ 3,217,804	$ 3,955,503	$ 2,492,638
7					$ -	$ 160,000	$ 160,000	$ 3,028,988	$ 3,853,719	$ 2,248,608
8					$ -	$ 160,000	$ 160,000	$ 2,972,328	$ 3,913,989	$ 2,114,606
9					$ -	$ 160,000	$ 160,000	$ 2,976,802	$ 4,057,075	$ 2,029,548
10					$ 31,807	$ 160,000	$ 191,807	$ 3,494,192	$ 4,928,903	$ 2,283,036
11					$ -	$ 160,000	$ 160,000	$ 2,809,058	$ 4,101,139	$ 1,758,908
12					$ -	$ 160,000	$ 160,000	$ 2,816,797	$ 4,256,373	$ 1,690,264
13					$ -	$ 160,000	$ 160,000	$ 2,705,581	$ 4,231,409	$ 1,555,880
14					$ -	$ 160,000	$ 160,000	$ 2,655,389	$ 4,298,264	$ 1,463,391
15					$ 31,807	$ 160,000	$ 191,807	$ 3,298,008	$ 5,525,314	$ 1,741,809
16	$ 739,000				$ -	$ 160,000	$ 899,000	$ 3,296,997	$ 5,716,947	$ 1,668,722
17	$ -	$ 100,000			$ -	$ 160,000	$ 260,000	$ 2,610,757	$ 4,685,462	$ 1,266,335
18	$ -	$ 98,000			$ -	$ 160,000	$ 258,000	$ 2,622,462	$ 4,871,195	$ 1,219,012
19	$ -	$ 96,040			$ -	$ 160,000	$ 256,040	$ 2,515,133	$ 4,835,347	$ 1,120,408
20	$ 36,950	$ 94,119			$ 31,807	$ 160,000	$ 322,876	$ 3,137,507	$ 6,242,977	$ 1,339,419
21	$ -	$ 92,237			$ -	$ 160,000	$ 252,237	$ 2,483,295	$ 5,114,177	$ 1,015,961
22	$ -	$ 90,392			$ -	$ 160,000	$ 250,392	$ 2,378,749	$ 5,070,332	$ 932,639
23	$ -	$ 88,584			$ -	$ 160,000	$ 248,584	$ 2,335,094	$ 5,151,486	$ 877,377
24	$ -	$ 86,813			$ -	$ 160,000	$ 246,813	$ 2,352,313	$ 5,371,102	$ 847,019
25	$ 36,950	$ 85,076			$ 31,807	$ 160,000	$ 313,833	$ 2,919,143	$ 6,898,650	$ 1,007,326
26	$ -	$ 83,375			$ -	$ 160,000	$ 243,375	$ 2,209,299	$ 5,403,853	$ 730,610
27	$ -	$ 81,707			$ -	$ 160,000	$ 241,707	$ 2,229,033	$ 5,642,946	$ 706,422
28	$ -	$ 80,073					$ 80,073	$ 1,969,572	$ 5,160,617	$ 598,186
29	$ -	$ 78,472					$ 78,472	$ 1,930,901	$ 5,236,367	$ 562,006
30	$ -	$ 76,902					$ 76,902	$ 1,953,002	$ 5,481,675	$ 544,754
	$ 812,900	$ 1,231,790	$ 1,879,000	$ 71,000	$ 3,190,034	$ 4,000,000	$ 11,185,000	$ 102,028,000	$ 163,597,000	**$ 64,161,000**

Year	Wellhead Total Capital Cost	Wellhead Total O&M Cost	Total Capital PV	Total O&M FV	Total O&M PV	Grand Total FV	Grand Total PV
1	$ 1,568,543	$ -	$ 1,452,354	$ -	$ -	$ 3,075,503	$ 2,847,688
2	$ 1,623,441	$ -	$ 1,391,839	$ -	$ -	$ 3,183,145	$ 2,729,034
3	$ -	$ 256,114	$ -	$ 203,311		$ 4,008,015	$ 3,181,692
4	$ 1,078,098	$ 183,604	$ 792,434	$ 134,954		$ 11,073,023	$ 8,139,003
5	$ 1,153,608	$ 190,030	$ 785,126	$ 129,331		$ 6,081,318	$ 4,138,843
6	$ -	$ 196,681	$ -	$ 123,942		$ -	$ -
7	$ -	$ 203,565	$ -	$ 118,778		$ -	$ -
8	$ -	$ 210,689	$ -	$ 113,829		$ -	$ -
9	$ -	$ 218,064	$ -	$ 109,086		$ -	$ -
10	$ 44,867	$ 225,696	$ 20,782	$ 104,541		$ 891,226	$ 412,810
11	$ -	$ 233,595	$ -	$ 100,185		$ -	$ -
12	$ -	$ 241,771	$ -	$ 96,011		$ -	$ -
13	$ -	$ 250,233	$ -	$ 92,010		$ -	$ -
14	$ -	$ 258,991	$ -	$ 88,176		$ -	$ -
15	$ 53,288	$ 268,056	$ 16,798	$ 84,502		$ 1,058,497	$ 333,682
16	$ 1,281,416	$ 277,438	$ 374,033	$ 80,981		$ 1,281,416	$ 374,033
17	$ -	$ 466,616	$ -	$ 126,112		$ -	$ -
18	$ -	$ 479,232	$ -	$ 119,927		$ -	$ -
19	$ -	$ 492,237	$ -	$ 114,057		$ -	$ -
20	$ 136,812	$ 505,644	$ 29,353	$ 108,485		$ 1,330,685	$ 285,496
21	$ -	$ 519,464	$ -	$ 103,195		$ -	$ -
22	$ -	$ 533,714	$ -	$ 98,172		$ -	$ -
23	$ -	$ 548,405	$ -	$ 93,402		$ -	$ -
24	$ -	$ 563,554	$ -	$ 88,872		$ -	$ -
25	$ 162,489	$ 579,175	$ 23,726	$ 84,570		$ 1,580,436	$ 230,772
26	$ -	$ 595,285	$ -	$ 80,484		$ -	$ -
27	$ -	$ 611,898	$ -	$ 76,602		$ -	$ -
28	$ -	$ 209,805	$ -	$ 24,319		$ -	$ -
29	$ -	$ 405,349	$ -	$ 43,505		$ -	$ -
30	$ -	$ 215,849	$ -	$ 21,450		$ -	$ -
	$ 7,103,000	**$ 9,941,000**	**$ 4,886,000**	**$ 2,763,000**		**$ 33,563,000**	**$ 130,217,000**	**$ 163,780,000**

Year	Total Capital PV	Total O&M PV	Grand Total PV
1	$ 2,847,688	$ 1,346,458	$ 4,194,146
2	$ 2,729,034	$ 1,290,356	$ 4,019,390
3	$ 3,181,692	$ 1,488,310	$ 4,670,002
4	$ 8,139,003	$ 2,704,145	$ 10,843,147
5	$ 4,138,843	$ 2,542,811	$ 6,681,654
6	$ -	$ 2,437,638	$ 2,437,638
7	$ -	$ 2,248,608	$ 2,248,608
8	$ -	$ 2,114,606	$ 2,114,606
9	$ -	$ 2,029,548	$ 2,029,548
10	$ 412,810	$ 1,870,226	$ 2,283,036
11	$ -	$ 1,758,908	$ 1,758,908
12	$ -	$ 1,690,264	$ 1,690,264
13	$ -	$ 1,555,880	$ 1,555,880
14	$ -	$ 1,463,391	$ 1,463,391
15	$ 333,682	$ 1,408,127	$ 1,741,809
16	$ 374,033	$ 1,294,689	$ 1,668,722
17	$ -	$ 1,266,335	$ 1,266,335
18	$ -	$ 1,219,012	$ 1,219,012
19	$ -	$ 1,120,408	$ 1,120,408
20	$ 285,496	$ 1,053,923	$ 1,339,419
21	$ -	$ 1,015,961	$ 1,015,961
22	$ -	$ 932,639	$ 932,639
23	$ -	$ 877,377	$ 877,377
24	$ -	$ 847,019	$ 847,019
25	$ 230,772	$ 776,554	$ 1,007,326
26	$ -	$ 730,610	$ 730,610
27	$ -	$ 706,422	$ 706,422
28	$ -	$ 598,186	$ 598,186
29	$ -	$ 562,006	$ 562,006
30	$ -	$ 544,754	$ 544,754
	$ 22,673,000	**$ 41,516,000**	**$ 64,189,000**

Capital *O&M* *20 yr PV* *20 yr PV* *20 yr FV* *20 yr FV*
6,940,000 *5,158,000*
4,863,000 *2,048,000*
31,983,000 *77,074,000*
22,442,000 *33,904,000*

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (following installation of additional wells)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. 30 years O&M for OU2 IRM
9. 30 years O&M for RW-400/-502 Plant
10. 4 diffusion wells for RW-400/RW-502 Plant located at the west end of VLSGC
11. O&M Costs for RW-400/-502 Plant, Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on ratio of new higher hp to old hp
* Assume Media Costs are increased by 100% (since flow rate will roughly triple and new flow will conservatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment media (PZ) will be required every 5 years in the IRM system and every 7.5 years in the RW-400/-502 system
13. Capital Costs
Years 1 and 2 - Install Groundwater Monitoring Wells, Extraction Wells, Diffusion Wells, and Piping
Years 2 - Install Treatment Plant at RW-400 (1/2)
Year 3 - Install Treatment Plant at RW-400 (1/2)

Table C-8. Cost Estimate for OU-2 Alternative 4b, LMC, Great Neck.

Outpost Monitoring
OU-2 IRM O&M
Install 3 New Extraction Wells at North Shore Long Island Jewish Hospital (NSLIJH) and in OU-1 (RW401BM, RW401MM, and EW1D)
Install 3 New Diffusion Wells at NSLIJH (DW404, DW405, and DW406)
Install New 1,000-gpm Treatment Plant at MLWD
30 Years of O&M of New Treatment Plant
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Wells					
1. RW401BM, RW401MM, and EW1D Extraction Well Installation	3	ea	$ 875,000	$ 2,625,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Access Fee	1	ea	$ 50,000	$ 50,000	Well access fee not required for EW-1D
3. Well Permitting Fee	3	ea	$ 20,000	$ 60,000	
4. Discharge Piping from RW401 to Treatment Plant	2,100	ft	$ 175	$ 367,500	Includes double-walled 8" PVC piping, trenching and restoration.
Subtotal				**$ 3,103,000**	
Install New Diffusion Wells (4)					
1. Drill and install diffusion wells	4	ea	$ 700,000	$ 2,800,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc. Bid
2. Discharge Piping from Plant	900	ft	$ 85	$ 76,500	Single-wall, 8" Blue Brute HDPE piping, trenching, and restoration. Est. from pervious ARCADIS FS cost estimates with inflation.
3. Piping Appurtenances	1	ls	$ 30,000	$ 30,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
4. Additional Design & Permitting	1	ea	$ 50,000	$ 50,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	1	ea	$ 50,000	$ 50,000	
Subtotal				**$ 2,957,000**	
Install 1,000-gpm Treatment Plant at NSLIJH					*Note: Basis of Below Costs, except as noted*
1. General Site Preperation	0.25	ea	$ 200,000	$ 50,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	0.5	ea	$ 100,000	$ 50,000	Foundation (incl. clearwells)
Building	4,200	sf	$ 250	$ 1,050,000	
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	625	cy	$ 6.62	$ 4,139	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 350,000	$ 350,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 372,000	$ 372,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in same
Horizontal Mist Eliminator and Knock-Out Tank	1	ea	$ 11,000	$ 11,000	
Duct Heater	1	ea	$ 37,000	$ 37,000	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	2	ea	$ 27,000	$ 54,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 116,000	$ 116,000	Bag Filter System.
Ducting	1	ls	$ 225,000	$ 225,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 27,000	$ 54,000	50 Hp pump. Est. from experience.
Blower	1	ea	$ 50,000	$ 50,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation)
4. Mechanical Components					
Extraction Well Piping Leak Detection System	2,100	ft	$ 25	$ 52,500	
Process Piping	1	ls	$ 175,000	$ 175,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 120,000	$ 120,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	0.5	ea	$ 90,000	$ 45,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	2,100	ft	$ 35	$ 73,500	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 1,616,500	$ 1,620,000	
8. Electrical Installation	25%	of	$ 383,500	$ 96,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 5,075,000**	
Subtotal of Capital Costs				**$ 13,135,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 13,135,000	$ 656,750	
2. Construction Management (7% of capital cost)	7%	of	$ 13,135,000	$ 919,450	
3. Project Management (10% of capital cost)	10%	of	$ 13,135,000	$ 1,313,500	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 13,135,000	$ 1,970,250	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 13,135,000	$ 1,132,894	
Subtotal				$ 5,993,000	
TOTAL CAPITAL COST				**$ 19,100,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 1,000-gpm RW401 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.67	ls	$ 190,000	$ 127,300	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 360,000	$ 360,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 200,000	$ 200,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 180,000	$ 180,000	2010 spend for OU-2, increased by 20% for 1,000-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 2,780,000**	

Table C-8. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost [1]	Monitoring Cost	OU-2 O&M Cost	OU-2 Capital Improvements	Pre-Escalated Cost	Escalated Cost (FV)	PV (Cost)	OU-2 Capital FV	OU-2 O&M FV	OU-2 Capital PV	OU-2 O&M PV
1	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 2,961,135	$ 2,741,792	$ 1,506,960	$ 1,454,175	$ 1,395,333	$ 1,346,458
2	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 3,064,775	$ 2,627,550	$ 1,559,704	$ 1,505,071	$ 1,337,194	$ 1,290,356
3	$ 3,766,000	$ 96,000	$ 1,364,000		$ 5,226,000	$ 5,794,160	$ 4,599,591	$ 4,175,432	$ 1,618,728	$ 3,314,592	$ 1,284,999
4	$ 8,431,000	$ 36,000	$ 2,780,000		$ 11,247,000	$ 12,906,191	$ 9,486,436	$ 9,674,766	$ 3,231,425	$ 7,111,242	$ 2,375,194
5	$ 4,020,000	$ 36,000	$ 2,724,400		$ 6,780,400	$ 8,052,988	$ 5,480,728	$ 4,774,499	$ 3,278,489	$ 3,249,444	$ 2,231,285
6		$ 96,000	$ 2,669,912	$ -	$ 2,765,912	$ 3,400,012	$ 2,142,584	$ -	$ 3,400,012	$ -	$ 2,142,584
7		$ 36,000	$ 2,616,514	$ -	$ 2,652,514	$ 3,374,738	$ 1,969,127	$ -	$ 3,374,738	$ -	$ 1,969,127
8		$ 36,000	$ 2,564,183	$ -	$ 2,600,183	$ 3,423,945	$ 1,849,851	$ -	$ 3,423,945	$ -	$ 1,849,851
9		$ 96,000	$ 2,512,900	$ -	$ 2,608,900	$ 3,555,663	$ 1,778,717	$ -	$ 3,555,663	$ -	$ 1,778,717
10		$ 36,000	$ 2,462,642	$ 600,000	$ 3,098,642	$ 4,370,940	$ 2,024,591	$ 846,359	$ 3,524,581	$ 392,028	$ 1,632,563
11		$ 36,000	$ 2,413,389	$ -	$ 2,449,389	$ 3,576,034	$ 1,533,700	$ -	$ 3,576,034	$ -	$ 1,533,700
12		$ 96,000	$ 2,365,121	$ -	$ 2,461,121	$ 3,718,923	$ 1,476,836	$ -	$ 3,718,923	$ -	$ 1,476,836
13		$ 36,000	$ 2,317,819	$ -	$ 2,353,819	$ 3,681,269	$ 1,353,595	$ -	$ 3,681,269	$ -	$ 1,353,595
14		$ 36,000	$ 2,271,462	$ -	$ 2,307,462	$ 3,735,077	$ 1,271,648	$ -	$ 3,735,077	$ -	$ 1,271,648
15		$ 96,000	$ 2,226,033	$ 600,000	$ 2,922,033	$ 4,895,425	$ 1,543,242	$ 1,005,209	$ 3,890,216	$ 316,884	$ 1,226,358
16		$ 36,000	$ 2,181,512	$ -	$ 2,217,512	$ 3,845,136	$ 1,122,358	$ -	$ 3,845,136	$ -	$ 1,122,358
17		$ 36,000	$ 2,137,882	$ -	$ 2,173,882	$ 3,901,413	$ 1,054,431	$ -	$ 3,901,413	$ -	$ 1,054,431
18		$ 96,000	$ 2,095,125	$ -	$ 2,191,125	$ 4,069,990	$ 1,018,511	$ -	$ 4,069,990	$ -	$ 1,018,511
19		$ 36,000	$ 2,053,222	$ -	$ 2,089,222	$ 4,016,532	$ 930,679	$ -	$ 4,016,532	$ -	$ 930,679
20		$ 36,000	$ 2,012,158	$ 600,000	$ 2,648,158	$ 5,269,275	$ 1,130,513	$ 1,193,873	$ 4,075,401	$ 256,143	$ 874,370
21		$ 96,000	$ 1,971,915	$ -	$ 2,067,915	$ 4,258,728	$ 846,021	$ -	$ 4,258,728	$ -	$ 846,021
22		$ 36,000	$ 1,932,476	$ -	$ 1,968,476	$ 4,195,830	$ 771,783	$ -	$ 4,195,830	$ -	$ 771,783
23		$ 36,000	$ 1,893,827	$ -	$ 1,929,827	$ 4,257,419	$ 725,103	$ -	$ 4,257,419	$ -	$ 725,103
24		$ 96,000	$ 1,855,950	$ -	$ 1,951,950	$ 4,456,943	$ 702,857	$ -	$ 4,456,943	$ -	$ 702,857
25		$ 36,000	$ 1,818,831	$ 600,000	$ 2,454,831	$ 5,801,367	$ 847,104	$ 1,417,947	$ 4,383,420	$ 207,046	$ 640,058
26		$ 36,000	$ 1,782,455	$ -	$ 1,818,455	$ 4,447,864	$ 601,359	$ -	$ 4,447,864	$ -	$ 601,359
27		$ 96,000	$ 1,746,805	$ -	$ 1,842,805	$ 4,665,186	$ 584,020	$ -	$ 4,665,186	$ -	$ 584,020
28		$ 36,000	$ 1,711,869	$ -	$ 1,747,869	$ 4,579,718	$ 530,852	$ -	$ 4,579,718	$ -	$ 530,852
29		$ 36,000	$ 1,677,632	$ -	$ 1,713,632	$ 4,647,161	$ 498,768	$ -	$ 4,647,161	$ -	$ 498,768
30		$ 96,000	$ 1,644,079	$ -	$ 1,740,079	$ 4,884,044	$ 485,363	$ -	$ 4,884,044	$ -	$ 485,363
	$ 19,129,000			$ 2,400,000	$ 85,751,114	$ 137,807,881	**$ 53,730,000**	$ 26,154,749	$ 111,653,132	$ 17,600,000	$ 36,100,000

Year	N12796 & N4388 Capital Cost	N12796 & N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Wellhead Pre-Escalated Cost	Total Pre-Escalated Cost	Total Escalated Cost (FV)	Total PV (Cost)
1					$ 1,515,500		$ 1,515,500	$ 4,376,500	$ 4,529,678	$ 4,194,146
2					$ 1,515,500		$ 1,515,500	$ 4,376,500	$ 4,688,216	$ 4,019,390
3					$ -	$ 160,000	$ 160,000	$ 5,386,000	$ 5,971,554	$ 4,740,412
4			$ 939,500		$ -	$ 160,000	$ 1,099,500	$ 12,346,500	$ 14,167,893	$ 10,413,824
5			$ 939,500		$ 31,807	$ 160,000	$ 1,131,307	$ 7,911,707	$ 9,396,626	$ 6,395,186
6			$ -	$ 71,000	$ -	$ 160,000	$ 231,000	$ 2,996,912	$ 3,683,970	$ 2,321,526
7			$ -	$ 69,580	$ -	$ 160,000	$ 229,580	$ 2,882,094	$ 3,666,828	$ 2,139,559
8			$ 93,950	$ 68,188	$ -	$ 160,000	$ 322,138	$ 2,922,322	$ 3,848,140	$ 2,079,030
9			$ -	$ 66,825	$ -	$ 160,000	$ 226,825	$ 2,835,724	$ 3,864,801	$ 1,933,363
10			$ -	$ 65,488			$ 65,488	$ 3,164,130	$ 4,463,318	$ 2,067,380
11			$ -	$ 64,178			$ 64,178	$ 2,513,567	$ 3,669,732	$ 1,573,885
12			$ -	$ 62,895			$ 62,895	$ 2,524,016	$ 3,813,961	$ 1,514,577
13			$ 93,950	$ 61,637			$ 155,587	$ 2,509,406	$ 3,924,600	$ 1,443,067
14			$ -	$ 60,404			$ 60,404	$ 2,367,867	$ 3,832,853	$ 1,304,937
15			$ -	$ 59,196			$ 59,196	$ 2,981,229	$ 4,994,599	$ 1,574,506
16			$ -	$ 58,012			$ 58,012	$ 2,275,525	$ 3,945,728	$ 1,151,720
17			$ -	$ 56,852			$ 56,852	$ 2,230,734	$ 4,003,444	$ 1,082,007
18	$ 739,000		$ 93,950	$ 55,715			$ 888,665	$ 3,079,789	$ 5,720,676	$ 1,431,594
19	$ -	$ 100,000	$ -	$ 54,601			$ 154,601	$ 2,243,823	$ 4,313,752	$ 999,548
20	$ -	$ 98,000	$ -	$ 53,509			$ 151,509	$ 2,799,666	$ 5,570,745	$ 1,195,193
21	$ -	$ 96,040	$ -	$ 52,438			$ 148,478	$ 2,216,393	$ 4,564,509	$ 906,766
22	$ 36,950	$ 94,119	$ -	$ 51,390			$ 182,459	$ 2,150,935	$ 4,584,743	$ 843,320
23	$ -	$ 92,237	$ 93,950	$ 50,362			$ 236,549	$ 2,166,375	$ 4,779,272	$ 813,983
24	$ -	$ 90,392	$ -	$ 49,355			$ 139,747	$ 2,091,697	$ 4,776,031	$ 753,177
25	$ -	$ 88,584	$ -	$ 48,368			$ 136,952	$ 2,591,783	$ 6,125,018	$ 894,362
26	$ -	$ 86,813	$ -	$ 47,400			$ 134,213	$ 1,952,667	$ 4,776,143	$ 645,743
27	$ 36,950	$ 85,076	$ -	$ 46,452			$ 168,478	$ 2,011,284	$ 5,091,700	$ 637,414
28	$ -	$ 83,375	$ 93,950	$ 45,523			$ 222,848	$ 1,970,717	$ 5,163,618	$ 598,534
29	$ -	$ 81,707	$ -	$ 44,613			$ 126,320	$ 1,839,952	$ 4,989,725	$ 535,535
30	$ -	$ 80,073	$ -	$ 43,720			$ 123,794	$ 1,863,873	$ 5,231,507	$ 519,893
	$ 812,900	$ 1,076,416	$ 2,348,750	$ 1,407,700	$ 3,062,807	$ 1,120,000	$ 9,829,000	$ 95,580,000	$ 152,154,000	**$ 60,724,000**

Year	Wellhead Total Capital FV	Wellhead Total O&M FV	Wellhead Total Capital PV	Wellhead Total O&M PV	Total Capital FV	Total O&M FV	Total FV	Total Capital PV	Total O&M NPV	Total NPV
1	$ 1,568,543	$ -	$ 1,452,354	$ -	$ 3,075,503	$ 1,454,175	$ 4,529,678	$ 2,847,688	$ 1,346,458	$ 4,194,146
2	$ 1,623,441	$ -	$ 1,391,839	$ -	$ 3,183,145	$ 1,505,071	$ 4,688,216	$ 2,729,034	$ 1,290,356	$ 4,019,390
3	$ -	$ 177,395	$ -	$ 140,822	$ 4,175,432	$ 1,796,123	$ 5,971,554	$ 3,314,592	$ 1,425,820	$ 4,740,412
4	$ 1,078,098	$ 183,604	$ 792,434	$ 134,954	$ 10,752,864	$ 3,415,028	$ 14,167,893	$ 7,903,676	$ 2,510,148	$ 10,413,824
5	$ 1,153,688	$ 190,030	$ 785,126	$ 129,331	$ 5,928,107	$ 3,468,519	$ 9,396,626	$ 4,034,570	$ 2,360,616	$ 6,395,186
6	$ -	$ 283,958	$ -	$ 178,942	$ -	$ 3,683,970	$ 3,683,970	$ -	$ 2,321,526	$ 2,321,526
7	$ -	$ 292,090	$ -	$ 170,432	$ -	$ 3,666,828	$ 3,666,828	$ -	$ 2,139,559	$ 2,139,559
8	$ 123,714	$ 300,481	$ 66,839	$ 162,340	$ 123,714	$ 3,724,426	$ 3,848,140	$ 66,839	$ 2,012,191	$ 2,079,030
9	$ -	$ 309,139	$ -	$ 154,646	$ -	$ 3,864,801	$ 3,864,801	$ -	$ 1,933,363	$ 1,933,363
10	$ -	$ 92,377	$ -	$ 42,789	$ 846,359	$ 3,616,959	$ 4,463,318	$ 392,028	$ 1,675,352	$ 2,067,380
11	$ -	$ 93,698	$ -	$ 40,186	$ -	$ 3,669,732	$ 3,669,732	$ -	$ 1,573,885	$ 1,573,885
12	$ -	$ 95,038	$ -	$ 37,741	$ -	$ 3,813,961	$ 3,813,961	$ -	$ 1,514,577	$ 1,514,577
13	$ 146,934	$ 96,397	$ 54,027	$ 35,445	$ 146,934	$ 3,777,667	$ 3,924,600	$ 54,027	$ 1,389,040	$ 1,443,067
14	$ -	$ 97,776	$ -	$ 33,289	$ -	$ 3,832,853	$ 3,832,853	$ -	$ 1,304,937	$ 1,304,937
15	$ -	$ 99,174	$ -	$ 31,264	$ 1,005,209	$ 3,989,390	$ 4,994,599	$ 316,884	$ 1,257,622	$ 1,574,506
16	$ -	$ 100,592	$ -	$ 29,362	$ -	$ 3,945,728	$ 3,945,728	$ -	$ 1,151,720	$ 1,151,720
17	$ -	$ 102,031	$ -	$ 27,576	$ -	$ 4,003,444	$ 4,003,444	$ -	$ 1,082,007	$ 1,082,007
18	$ 1,547,196	$ 103,490	$ 387,184	$ 25,898	$ 1,547,196	$ 4,173,480	$ 5,720,676	$ 387,184	$ 1,044,409	$ 1,431,594
19	$ -	$ 297,220	$ -	$ 68,869	$ -	$ 4,313,752	$ 4,313,752	$ -	$ 999,548	$ 999,548
20	$ -	$ 301,470	$ 64,680	$ 64,680	$ 1,193,873	$ 4,376,871	$ 5,570,745	$ 256,143	$ 939,050	$ 1,195,193
21	$ -	$ 305,781	$ -	$ 60,745	$ -	$ 4,564,509	$ 4,564,509	$ -	$ 906,766	$ 906,766
22	$ -	$ 310,154	$ 14,487	$ 57,050	$ 78,759	$ 4,505,984	$ 4,584,743	$ 14,487	$ 828,833	$ 843,320
23	$ 207,264	$ 314,589	$ 35,300	$ 53,579	$ 207,264	$ 4,572,008	$ 4,779,272	$ 35,300	$ 778,683	$ 813,983
24	$ -	$ 319,088	$ -	$ 50,320	$ -	$ 4,776,031	$ 4,776,031	$ -	$ 753,177	$ 753,177
25	$ -	$ 323,651	$ -	$ 47,259	$ 1,417,947	$ 4,707,071	$ 6,125,018	$ 207,046	$ 687,317	$ 894,362
26	$ -	$ 328,279	$ -	$ 44,384	$ -	$ 4,776,143	$ 4,776,143	$ -	$ 645,743	$ 645,743
27	$ 93,541	$ 332,973	$ 11,710	$ 41,684	$ 93,541	$ 4,998,159	$ 5,091,700	$ 11,710	$ 625,704	$ 637,414
28	$ 246,165	$ 337,735	$ 28,534	$ 39,148	$ 246,165	$ 4,917,453	$ 5,163,618	$ 28,534	$ 570,000	$ 598,534
29	$ -	$ 342,564	$ -	$ 36,767	$ -	$ 4,989,725	$ 4,989,725	$ -	$ 535,535	$ 535,535
30	$ -	$ 347,463	$ -	$ 34,530	$ -	$ 5,231,507	$ 5,231,507	$ -	$ 519,893	$ 519,893
	$ 7,867,000	$ 6,478,000	$ 5,020,000	$ 1,974,000	$ 34,022,000	$ 118,131,000	$ 152,153,000	$ 22,600,000	$ 38,124,000	$ 60,724,000

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (following installation of additional wells)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. 30 years O&M for OU2 IRM
9. 30 years O&M for RW-400/-502 Plant
10. 4 diffusion wells for RW-400/RW-502 Plant located at the west end of VLSGC
11. O&M Costs for RW-400/-502 Plant, Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on ratio of new higher hp to old hp
* Assume Media Costs are increased by 100% (since flow rate will roughly triple and new flow will conservatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment media (PZ) will be required every 5 years in the IRM system and every 7.5 years in the RW-400/-502 system
13. Capital Costs
Years 1 and 2 - Install Groundwater Monitoring Wells, Extraction Wells, Diffusion Wells, and Piping
Years 2 - Install Treatment Plant at RW-400 (1/2)
Year 3 - Install Treatment Plant at RW-400 (1/2)

Table C-9. Cost Estimate for OU-2 Alternative 4c, LMC, Great Neck.

Outpost Monitoring
OU-2 IRM O&M
Install 3 New Extraction Wells at VLSGC and MLWD South and in OU-1 (RW300, RW402, and EW1D)
Install 4 New Diffusion Wells at NSLIJH South and MLWD North (DW404, DW405, DW407, and DW408)
Install New 1,600-gpm Treatment Plant in east side of FMCC
30 Years of O&M of New Treatment Plant
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Wells (3)					
1. RW300, RW402, and EW1D Extraction Well Installation	3	ea	$ 875,000	$ 2,625,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Access Fee	2	ea	$ 50,000	$ 100,000	Well access fee not required for EW1D
3. Well Permitting Fee	3	ea	$ 20,000	$ 60,000	
4A. Discharge Piping from RW300 to New FMCC Treatment Plant	5,100	ft	$ 175	$ 892,500	Includes double-walled 8" PVC piping, trenching and restoration.
4B. Discharge Piping from RW402 to New FMCC Treatment Plant	100	ft	$ 175	$ 17,500	Includes double-walled 8" PVC piping, trenching and restoration.
Subtotal				**$ 3,695,000**	
Install New Diffusion Wells (4)					
1. Drill and install diffusion wells	4	ea	$ 700,000	$ 2,800,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc. Bid
2. Discharge Piping from Plant	4,200	ft	$ 85	$ 356,394	Single-wall, 8" Blue Brute HDPE piping, trenching, and restoration. Est. from pervious ARCADIS FS cost estimates with inflation.
3. Piping Appurtenances	2	ls	$ 30,000	$ 60,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
4. Additional Design & Permitting	2	ea	$ 50,000	$ 100,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	2	ea	$ 50,000	$ 100,000	
Subtotal				**$ 3,417,000**	
Install 1,600-gpm Treatment Plant at FMCC					*Note: Basis of Below Costs, except as noted*
1. General Site Preperation	1	ea	$ 200,000	$ 200,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	1	ea	$ 100,000	$ 100,000	Foundation (incl. clearwells)
Building	5,400	sf	$ 250	$ 1,350,000	
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	1,250	cy	$ 6.62	$ 8,279	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 405,000	$ 405,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 665,000	$ 665,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in same
Horizontal Mist Eliminator and Knock-Out Tank	1	ea	$ 35,000	$ 35,000	
Duct Heater	1	ea	$ 45,000	$ 45,000	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	2	ea	$ 37,500	$ 75,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 130,000	$ 130,000	Bag Filter System.
Ducting	1	ls	$ 225,000	$ 225,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 37,500	$ 75,000	50 Hp pump. Est. from experience.
Blower	2	ea	$ 30,000	$ 60,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation)
4. Mechanical Components					
Extraction Well Piping Leak Detection System	5,200	ft	$ 25	$ 130,000	
Process Piping	1	ls	$ 210,000	$ 210,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 135,000	$ 135,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	1	ea	$ 90,000	$ 90,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	5,200	ft	$ 35	$ 182,000	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 2,190,000	$ 2,190,000	
8. Electrical Installation	25%	of	$ 537,000	$ 134,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 6,914,000**	
Subtotal of Capital Costs				**$ 16,026,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 16,026,000	$ 801,300	
2. Construction Management (7% of capital cost)	7%	of	$ 16,026,000	$ 1,121,820	
3. Project Management (10% of capital cost)	10%	of	$ 16,026,000	$ 1,602,600	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 16,026,000	$ 2,403,900	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 16,026,000	$ 1,382,243	
Subtotal				$ 7,312,000	
TOTAL CAPITAL COST				**$ 23,300,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 1,600-gpm RW300 and RW402 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.67	ls	$ 190,000	$ 127,300	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.67	ls	$ 210,000	$ 140,700	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 576,000	$ 576,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 320,000	$ 320,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 210,000	$ 210,000	2010 spend for OU-2, increased by 40% for 1,600-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 3,220,000**	

Table C-9. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost [1]	Monitoring Cost	OU2 O&M Cost	OU2 Capital Improvements	OU2 Pre-Escalated Cost	OU2 Escalated Cost (FV)	Total OU2 NPV Cost	OU2 Capital (FV)	OU2 O&M (FV)	OU2 Capital (PV)	OU2 O&M (PV)	Year	N12796 & N4388 Capital Cost	N12796 & N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Wellhead Pre-Escalated Cost	Grand Total Pre-Escalated Cost	Grand Total Escalated Cost (FV)	Grand Total NPV Cost	Wellhead Total Capital FV	Wellhead Total O&M FV	Wellhead Total Capital PV	Wellhead Total O&M PV	Total Capital FV Cost	Total O&M FV Cost	Total FV Cost	Total Capital PV Cost	Total O&M PV Cost	Total PV Cost
1	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 2,961,135	$ 2,741,792	$ 1,506,960	$ 1,454,175	$ 1,395,333	$ 1,346,458	2011	1				$ 1,515,500		$ 1,515,500	$ 4,376,500	$ 4,529,678	$ 4,194,146	$ 1,568,543	$ -	$ 1,452,354	$ -	$ 3,075,503	$ 1,454,175	$ 4,529,678	$ 2,847,688	$ 1,346,458	$ 4,194,146
2	$ 4,909,000	$ 41,000	$ 1,364,000		$ 6,314,000	$ 6,763,715	$ 5,798,795	$ 5,258,644	$ 1,505,071	$ 4,508,439	$ 1,290,356	2012	2				$ 1,515,500		$ 1,515,500	$ 7,829,500	$ 8,387,156	$ 7,190,635	$ 1,623,441	$ -	$ 1,391,839	$ -	$ 6,882,085	$ 1,505,071	$ 8,387,156	$ 5,900,279	$ 1,290,356	$ 7,190,635
3	$ 6,308,000	$ 96,000	$ 1,364,000		$ 8,268,000	$ 9,166,879	$ 7,276,964	$ 7,548,151	$ 1,618,728	$ 5,991,966	$ 1,284,999	2013	3				$ -	$ 160,000	$ 160,000	$ 8,428,000	$ 9,344,274	$ 7,417,786	$ -	$ -	$ -	$ 140,822	$ 7,548,151	$ 1,796,123	$ 9,344,274	$ 5,991,966	$ 1,425,820	$ 7,417,786
4	$ 6,809,000	$ 36,000	$ 1,364,000		$ 8,209,000	$ 9,420,016	$ 6,923,993	$ 7,813,484	$ 1,606,532	$ 5,743,144	$ 1,180,849	2014	4			$ 939,500	$ -	$ 160,000	$ 1,099,500	$ 9,308,500	$ 10,681,718	$ 7,851,381	$ 1,078,098	$ 183,604	$ 792,434	$ 134,954	$ 8,891,582	$ 1,790,136	$ 10,681,718	$ 6,535,578	$ 1,315,803	$ 7,851,381
5	$ 3,356,000	$ 36,000	$ 1,364,000		$ 4,756,000	$ 5,648,636	$ 3,844,367	$ 3,985,875	$ 1,662,761	$ 2,712,720	$ 1,131,647	2015	5			$ 939,500	$ -	$ 31,807	$ 160,000	$ 1,131,307	$ 5,887,307	$ 6,992,274	$ 4,758,824	$ 1,153,608	$ 190,030	$ 785,126	$ 129,331	$ 5,139,483	$ 1,852,791	$ 6,992,274	$ 3,497,846	$ 1,260,978	$ 4,758,824
6		$ 36,000	$ 3,220,000	$ -	$ 3,316,000	$ 4,076,211	$ 2,568,704	$ -	$ -	$ -	$ 2,568,704	2016	6			$ -	$ 71,000	$ -	$ 231,000	$ 3,547,000	$ 4,360,169	$ 2,747,646	$ -	$ -	$ -	$ 178,942	$ -	$ -	$ 4,360,169	$ 4,360,169	$ -	$ 2,747,646	$ 2,747,646
7		$ 36,000	$ 3,155,600	$ -	$ 3,191,600	$ 4,060,606	$ 2,369,325	$ -	$ -	$ -	$ 2,369,325	2017	7			$ -	$ 69,580	$ -	$ 229,580	$ 3,421,180	$ 4,352,696	$ 2,539,757	$ -	$ -	$ 292,090	$ -	$ 170,432	$ -	$ 4,352,696	$ 4,352,696	$ -	$ 2,539,757	$ 2,539,757
8		$ 36,000	$ 3,092,488	$ -	$ 3,128,488	$ 4,119,621	$ 2,225,703	$ -	$ -	$ -	$ 2,225,703	2018	8			$ 93,950	$ 68,188	$ -	$ 160,000	$ 322,138	$ 3,450,626	$ 4,543,816	$ 2,454,882	$ 123,714	$ 300,481	$ -	$ 66,839	$ 123,714	$ 4,420,102	$ 4,543,816	$ 66,839	$ 2,388,043	$ 2,454,882
9		$ 96,000	$ 3,030,638	$ -	$ 3,126,638	$ 4,261,287	$ 2,131,704	$ -	$ -	$ -	$ 2,131,704	2019	9			$ -	$ 66,825	$ -	$ 160,000	$ 226,825	$ 3,353,463	$ 4,570,426	$ 2,286,351	$ -	$ 309,139	$ -	$ 154,646	$ -	$ 4,570,426	$ 4,570,426	$ -	$ 2,286,351	$ 2,286,351
10		$ 36,000	$ 2,970,025	$ 600,000	$ 3,606,025	$ 5,086,655	$ 2,356,106	$ 846,359	$ 4,240,296	$ 392,028	$ 1,964,077	2020	10			$ -	$ 65,488	$ -	$ 160,000	$ 225,488	$ 3,831,514	$ 5,404,728	$ 2,503,435	$ -	$ 318,073	$ -	$ 147,329	$ 846,359	$ 4,558,369	$ 5,404,728	$ 392,028	$ 2,111,407	$ 2,503,435
11		$ 36,000	$ 2,910,625	$ -	$ 2,946,625	$ 4,301,983	$ 1,845,047	$ -	$ 4,301,983	$ -	$ 1,845,047	2021	11			$ -	$ 64,178	$ -		$ 64,178	$ 3,010,803	$ 4,395,682	$ 1,885,233	$ -	$ 93,698	$ -	$ 40,186	$ -	$ 4,395,682	$ 4,395,682	$ -	$ 1,885,233	$ 1,885,233
12		$ 36,000	$ 2,852,412	$ -	$ 2,948,412	$ 4,455,254	$ 1,769,243	$ -	$ 4,455,254	$ -	$ 1,769,243	2022	12			$ -	$ 62,895	$ -		$ 62,895	$ 3,011,307	$ 4,550,292	$ 1,806,984	$ -	$ 95,038	$ -	$ 37,741	$ -	$ 4,550,292	$ 4,550,292	$ -	$ 1,806,984	$ 1,806,984
13		$ 36,000	$ 2,795,364	$ -	$ 2,831,364	$ 4,428,129	$ 1,628,214	$ -	$ 4,428,129	$ -	$ 1,628,214	2023	13			$ 93,950	$ 61,637			$ 155,587	$ 2,986,951	$ 4,671,460	$ 1,717,686	$ 146,934	$ 96,397	$ 54,027	$ 35,445	$ 146,934	$ 4,524,527	$ 4,671,460	$ 54,027	$ 1,663,659	$ 1,717,686
14		$ 36,000	$ 2,739,457	$ -	$ 2,775,457	$ 4,492,617	$ 1,529,561	$ -	$ 4,492,617	$ -	$ 1,529,561	2024	14			$ -	$ 60,404			$ 60,404	$ 2,835,861	$ 4,590,393	$ 1,562,850	$ -	$ 97,776	$ -	$ 33,289	$ -	$ 4,590,393	$ 4,590,393	$ -	$ 1,562,850	$ 1,562,850
15		$ 96,000	$ 2,684,668	$ 600,000	$ 3,380,668	$ 5,663,798	$ 1,785,465	$ 1,005,209	$ 4,658,589	$ 316,884	$ 1,468,581	2025	15			$ -	$ 59,196			$ 59,196	$ 3,439,864	$ 5,762,972	$ 1,816,729	$ -	$ 99,174	$ -	$ 31,264	$ 1,005,209	$ 4,757,763	$ 5,762,972	$ 316,884	$ 1,499,845	$ 1,816,729
16		$ 36,000	$ 2,630,974	$ -	$ 2,666,974	$ 4,624,496	$ 1,349,846	$ -	$ 4,624,496	$ -	$ 1,349,846	2026	16			$ -	$ 58,012			$ 58,012	$ 2,724,987	$ 4,725,089	$ 1,379,208	$ -	$ 100,592	$ -	$ 29,362	$ -	$ 4,725,089	$ 4,725,089	$ -	$ 1,379,208	$ 1,379,208
17		$ 36,000	$ 2,578,355	$ -	$ 2,614,355	$ 4,691,919	$ 1,268,080	$ -	$ 4,691,919	$ -	$ 1,268,080	2027	17			$ -	$ 56,852			$ 56,852	$ 2,671,207	$ 4,793,950	$ 1,295,656	$ -	$ 102,031	$ -	$ 27,576	$ -	$ 4,793,950	$ 4,793,950	$ -	$ 1,295,656	$ 1,295,656
18		$ 36,000	$ 2,526,788	$ -	$ 2,622,788	$ 4,871,800	$ 1,219,163	$ -	$ 4,871,800	$ -	$ 1,219,163	2028	18	$ 739,000		$ 93,950	$ 55,715			$ 888,665	$ 3,511,453	$ 6,522,486	$ 1,632,246	$ 1,547,196	$ 103,490	*Capital* *20 yr FV*	*O&M* *20 yr FV*	$ 387,184	$ 25,898	*Capital* *20 yr PV*	*O&M* *20 yr PV*	$ 1,547,196	$ 4,975,290	$ 6,522,486	$ 387,184	$ 1,245,061	$ 1,632,246	*Capital* *20 yr FV*	*O&M* *20 yr FV*	*Capital* *20 yr NPV*	*O&M* *20 yr NPV*
19		$ 36,000	$ 2,476,252	$ -	$ 2,512,252	$ 4,829,808	$ 1,119,125	$ -	$ 4,829,808	$ -	$ 1,119,125	2029	19	$ -	$ 100,000	$ -	$ 54,601			$ 154,601	$ 2,666,853	$ 5,127,028	$ 1,187,994	$ -	$ 297,220	$ 7,242,000	$ 3,442,000	$ -	$ 68,869	$ 4,930,000	$ 1,613,000	$ 1,193,873	$ 5,127,028	$ 5,127,028	$ 36,400,000	$ 78,302,000	$ 256,143	$ 1,116,032	$ 1,372,175	$ 26,246,000	$ 33,355,000
20		$ 36,000	$ 2,426,727	$ 600,000	$ 3,062,727	$ 6,094,180	$ 1,307,495	$ 1,193,873	$ 4,900,307	$ 256,143	$ 1,051,352	2030	20	$ -	$ 98,000	$ -	$ 53,509			$ 151,509	$ 3,214,236	$ 6,395,650	$ 1,372,175	$ -	$ 301,470			$ -	$ 64,680			$ 1,193,873	$ 5,201,777	$ 6,395,650			$ 256,143	$ 1,116,032	$ 1,372,175		
21		$ 96,000	$ 2,378,193	$ -	$ 2,474,193	$ 5,095,430	$ 1,012,236	$ -	$ 5,095,430	$ -	$ 1,012,236	2031	21	$ -	$ 96,040	$ -	$ 52,438			$ 148,478	$ 2,622,671	$ 5,401,211	$ 1,072,982	$ -	$ 305,781			$ -	$ 60,745			$ -	$ 5,401,211	$ 5,401,211			$ -	$ -	$ -		
22		$ 36,000	$ 2,330,629	$ -	$ 2,366,629	$ 5,044,496	$ 927,887	$ -	$ 5,044,496	$ -	$ 927,887	2032	22	$ 36,950	$ 94,119	$ -	$ 51,390			$ 182,459	$ 2,549,087	$ 5,433,410	$ 999,424	$ 78,759	$ 310,154			$ 14,487	$ 57,050			$ 78,759	$ 5,354,650	$ 5,433,410			$ 14,487	$ 984,937	$ 999,424		
23		$ 36,000	$ 2,284,016	$ -	$ 2,320,016	$ 5,118,221	$ 871,711	$ -	$ 5,118,221	$ -	$ 871,711	2033	23	$ -	$ 92,237	$ 93,950	$ 50,362			$ 236,549	$ 2,556,565	$ 5,640,075	$ 960,591	$ 207,264	$ 314,589			$ 35,300	$ 53,579			$ 207,264	$ 5,432,810	$ 5,640,075			$ 35,300	$ 925,291	$ 960,591		
24		$ 96,000	$ 2,238,336	$ -	$ 2,334,336	$ 5,330,055	$ 840,546	$ -	$ 5,330,055	$ -	$ 840,546	2034	24	$ -	$ 90,392	$ -	$ 49,355			$ 139,747	$ 2,474,082	$ 5,649,143	$ 890,866	$ -	$ 319,088			$ -	$ 50,320			$ -	$ 5,649,143	$ 5,649,143			$ -	$ 890,866	$ 890,866		
25		$ 36,000	$ 2,193,569	$ 600,000	$ 2,829,569	$ 6,686,965	$ 976,417	$ 1,417,947	$ 5,269,018	$ 207,046	$ 769,371	2035	25	$ -	$ 88,584	$ -	$ 48,368			$ 136,952	$ 2,966,521	$ 7,010,615	$ 1,023,675	$ -	$ 323,651			$ 1,417,947	$ 5,592,668	$ 7,010,615	$ 207,046	$ 816,630	$ 1,023,675			$ 207,046	$ 816,630	$ 1,023,675		
26		$ 36,000	$ 2,149,698	$ -	$ 2,185,698	$ 5,346,126	$ 722,806	$ -	$ 5,346,126	$ -	$ 722,806	2036	26	$ -	$ 86,813	$ -	$ 47,400			$ 134,213	$ 2,319,910	$ 5,674,405	$ 767,190	$ -	$ 328,279			$ -	$ 44,384			$ -	$ 5,674,405	$ 5,674,405			$ -	$ 767,190	$ 767,190		
27		$ 96,000	$ 2,106,704	$ -	$ 2,202,704	$ 5,576,292	$ 698,078	$ -	$ 5,576,292	$ -	$ 698,078	2037	27	$ 36,950	$ 85,076	$ -	$ 46,452			$ 168,478	$ 2,371,182	$ 6,002,807	$ 751,472	$ 93,541	$ 332,973			$ 11,710	$ 41,684			$ 93,541	$ 5,909,265	$ 6,002,807			$ 11,710	$ 739,762	$ 751,472		
28		$ 36,000	$ 2,064,570	$ -	$ 2,100,570	$ 5,503,854	$ 637,972	$ -	$ 5,503,854	$ -	$ 637,972	2038	28	$ -	$ 83,375	$ 93,950	$ 45,523			$ 222,848	$ 2,323,418	$ 6,087,753	$ 705,654	$ 246,165	$ 337,735			$ 28,534	$ 39,148			$ 246,165	$ 5,841,588	$ 6,087,753			$ 28,534	$ 677,120	$ 705,654		
29		$ 36,000	$ 2,023,278	$ -	$ 2,059,278	$ 5,584,511	$ 599,372	$ -	$ 5,584,511	$ -	$ 599,372	2039	29	$ -	$ 81,707	$ -	$ 44,613			$ 126,320	$ 2,185,598	$ 5,927,076	$ 636,138	$ -	$ 342,564			$ -	$ 36,767			$ -	$ 5,927,076	$ 5,927,076			$ -	$ 636,138	$ 636,138		
30		$ 96,000	$ 1,982,813	$ -	$ 2,078,813	$ 5,834,798	$ 579,647	$ -	$ 5,834,798	$ -	$ 579,647	2040	30	$ -	$ 80,073	$ -	$ 43,720			$ 123,794	$ 2,202,606	$ 6,182,261	$ 614,377	$ -	$ 347,463			$ -	$ 34,530			$ -	$ 6,182,261	$ 6,182,261			$ -	$ 614,377	$ 614,377		
	$ 23,338,000			$ 2,400,000	$ 98,090,179	$ 159,139,496	**$ 60,926,000**	$ 30,576,503	$ 128,562,992	$ 21,523,703	$ 39,401,862			$ 812,900	$ 1,076,416	$ 2,348,750	$ 1,407,700	$ 3,062,807	$ 1,280,000	$ 9,989,000	**$ 108,100,000**	**$ 173,700,000**	**$ 68,000,000**	**$ 7,870,000**	**$ 6,710,000**																		
																									$ 5,020,000	**$ 2,079,000**																

Table C-10. Cost Estimate for OU-2 Alternative 4d, LMC, Great Neck.

Outpost Monitoring
OU-2 IRM O&M
Install 5 New Extraction Wells at MLWD, Village of Lake Success (VLS) Park, and Korean Church and in OU-1 (RW400BM, RW400MM, RW403, RW404, and EW1D)
Install 8 New Diffusion Wells at NSLIJH North and South (DW404, DW405, and DW409 through DW414)
Install New 3,000-gpm Treatment Plant east of FMCC
30 Years of O&M of New Treatment Plant
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Wells (5)					
1. RW400BM, RW400MM, RW403, RW404, and EW1D Extraction Well Installation	5	ea	$ 875,000	$ 4,375,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Access Fee	3	ea	$ 50,000	$ 150,000	Well access fee not required for EW1D
3. Well Permitting Fee	5	ea	$ 20,000	$ 100,000	
4A. Piping from RW400BM and RW400MM to Treatment Plant	3,500	ft	$ 225	$ 787,500	Includes two double-walled 8" HDPE piping, trenching and restoration
4B. Piping from RW400BM to RW400MM	150	ft	$ 175	$ 26,250	Includes double-walled 8" HDPE piping, trenching and restoration
4C. Piping from RW403 to Treatment Plant	3,200	ft	$ 175	$ 560,000	Includes double-walled 8" HDPE piping, trenching and restoration
4D. Piping from RW404 to Treatment Plant	50	ft	$ 175	$ 8,750	Includes double-walled 8" HDPE piping, trenching and restoration
Subtotal				**$ 6,008,000**	
Install New Diffusion Wells (8)					
1. Drill and install diffusion wells	8	ea	$ 700,000	$ 5,600,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc. Bid Single-wall, 8" Blue Brute HDPE piping, trenching, and restoration. Est. from previous
2. Discharge Piping from Plant (Total)	9,100	ft	$ 85	$ 772,186	ARCADIS FS cost estimates plus inflation
3. Piping Appurtenances	2	ls	$ 30,000	$ 60,000	Valves, piping between diffusion wells. Basis: previous ARCADIS FS cost estimate
4. Additional Design & Permitting	2	ea	$ 50,000	$ 100,000	ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	2	ea	$ 50,000	$ 100,000	
Subtotal				**$ 6,633,000**	
Install 3,000-gpm Treatment Plant					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	1	ea	$ 200,000	$ 200,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	1	ea	$ 100,000	$ 100,000	Foundation (incl. clearwells)
Building	7,300	sf	$ 250	$ 1,825,000	
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	1,250	cy	$ 6.62	$ 8,279	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	3	ea	$ 185,000	$ 555,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in same config. As IRM); 56,000 lb PPZ x $1.10/pound; 60,000 lb VPGAC x $1.20/pound
Off-gas Treatment Vessels, filled with media	1	ls	$ 910,000	$ 910,000	
Horizontal Mist Eliminator and Knock-Out Tank	3	ea	$ 17,500	$ 52,500	
Duct Heater	1	ea	$ 60,000	$ 60,000	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	3	ea	$ 35,000	$ 105,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 185,000	$ 185,000	Bag Filter System.
Ducting	1	ls	$ 375,000	$ 375,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	3	ea	$ 35,000	$ 105,000	50 Hp pump. Est. from experience.
Blower	4	ea	$ 32,000	$ 128,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation)
4. Mechanical Components					
Extraction Well Piping Leak Detection System	6,900	ft	$ 25	$ 172,500	
Process Piping	1	ls	$ 280,000	$ 280,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 185,000	$ 185,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	1	ea	$ 90,000	$ 90,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	6,900	ft	$ 35	$ 241,500	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 3,113,000	$ 3,110,000	
8. Electrical Installation	25%	of	$ 596,500	$ 149,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 9,307,000**	
Subtotal of Capital Costs				**$ 23,948,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 23,948,000	$ 1,197,400	
2. Construction Management (7% of capital cost)	7%	of	$ 23,948,000	$ 1,676,360	
3. Project Management (10% of capital cost)	10%	of	$ 23,948,000	$ 2,394,800	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 23,948,000	$ 3,592,200	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 23,948,000	$ 2,065,515	
Subtotal				$ 10,926,000	
TOTAL CAPITAL COST				**$ 34,900,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 3,000-gpm RW400, RW403, and RW404 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	1	ls	$ 190,000	$ 190,000	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	1.33	ls	$ 210,000	$ 279,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 1,080,000	$ 1,080,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 600,000	$ 600,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 315,000	$ 315,000	2010 spend for OU-2, increased by 110% for 3,000-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 4,540,000**	

Table C-10. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost [1]	Monitoring Cost	OU-2 O&M Cost	OU-2 Capital Improvements	OU-2 Pre-Escalated Cost	OU-2 Escalated Cost (FV)	OU-2 PV (Cost)	OU-2 Total Capital FV	OU-2 Total O&M FV	OU-2 Capital (NPV)	OU-2 O&M (NPV)	N12796 & N4308 Capital Cost	N12796 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Welbaud Pre-Escalated Cost	Grand Total Pre-Escalated Cost	Grand Total Escalated Cost (FV)	Grand Total PV (Cost)	Welbaud Capital (FV)	Welbaud O&M (FV)	Welbaud Capital (NPV)	Welbaud O&M (NPV)	Total Capital (FV)	Total O&M (FV)	Total FV Cost	Total Capital (NPV)	Total O&M (NPV)	Total NPV Cost
1	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 2,961,135	$ 2,741,792	$ 1,506,960	$ 1,454,175	$ 1,395,333	$ 1,346,458					$ 1,515,500		$ 1,515,500	$ 4,376,500	$ 4,529,678	$ 4,194,146	$ 1,568,543	$ -	$ 1,452,354	$ -	$ 3,075,503	$ 1,454,175	$ 4,529,678	$ 2,847,688	$ 1,346,458	$ 4,194,146
2	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 3,064,775	$ 2,627,550	$ 1,559,704	$ 1,505,071	$ 1,337,194	$ 1,290,356					$ 1,515,500		$ 1,515,500	$ 4,376,500	$ 4,688,216	$ 4,019,390	$ 1,623,441	$ -	$ 1,391,839	$ -	$ 3,183,145	$ 1,505,071	$ 4,688,216	$ 2,729,034	$ 1,290,356	$ 4,019,390
3	$ 7,191,000	$ 41,000	$ 1,364,000		$ 8,651,000	$ 9,591,518	$ 7,614,056	$ 7,972,790	$ 1,618,728	$ 6,329,058	$ 1,284,999					$ -	$ 160,000	$ 160,000	$ 8,811,000	$ 9,768,913	$ 7,754,878	$ -	$ 177,395	$ -	$ 7,972,790	$ 1,796,123	$ 9,768,913	$ 6,329,058	$ 1,425,820	$ 7,754,878
4	$ 16,988,000	$ 36,000	$ 1,364,000		$ 18,388,000	$ 21,100,653	$ 15,509,610	$ 19,494,121	$ 1,606,532	$ 14,328,761	$ 1,180,849		$ 939,500				$ 160,000	$ 1,099,500	$ 19,487,500	$ 22,362,354	$ 16,436,998	$ 1,078,098	$ 183,604		$ 792,434	$ 134,954	$ 20,572,219	$ 1,790,136	$ 22,362,354	$ 15,121,195	$ 1,315,803	$ 16,436,998
5	$ 7,784,000	$ 36,000	$ 1,364,000		$ 9,184,000	$ 10,907,711	$ 7,423,605	$ 9,244,950	$ 1,662,761	$ 6,291,958	$ 1,131,647		$ 939,500		$ 31,807	$ -	$ 160,000	$ 1,131,307	$ 10,315,307	$ 12,251,349	$ 8,338,062	$ 1,153,608	$ 190,030		$ 785,126	$ 129,331	$ 10,398,558	$ 1,852,791	$ 12,251,349	$ 7,077,084	$ 1,260,978	$ 8,338,062
6	$ 96,000	$ 4,540,000	$ -	$ 4,636,000	$ 5,698,828	$ 5,591,228	$ -	$ -	$ 5,698,828	$ -	$ 5,591,228			$ -	$ 71,000	$ -	$ 160,000	$ 231,000	$ 4,867,000	$ 5,982,786	$ 5,370,170	$ -	$ 283,958		$ -	$ 178,942	$ -	$ 5,982,786	$ 5,982,786	$ -	$ 3,770,170	$ 3,770,170
7	$ 36,000	$ 4,449,200	$ -	$ 4,485,200	$ 5,706,427	$ 3,329,645	$ -	$ -	$ 5,706,427	$ -	$ 3,329,645			$ -	$ 69,580	$ -	$ 160,000	$ 229,580	$ 4,714,780	$ 5,998,517	$ 3,500,077	$ -	$ 292,090		$ -	$ 170,432	$ -	$ 5,998,517	$ 5,998,517	$ -	$ 3,500,077	$ 3,500,077
8	$ 36,000	$ 4,360,216	$ -	$ 4,396,216	$ 5,588,977	$ 3,127,604	$ -	$ -	$ 5,588,977	$ -	$ 3,127,604			$ 93,950	$ -	$ 68,188	$ -	$ 162,138	$ 4,718,354	$ 5,751,114	$ 3,356,783	$ 123,714	$ 300,481		$ 66,839	$ 162,340	$ 123,714	$ 6,089,458	$ 6,213,172	$ -	$ 3,356,783	$ 3,356,783
9	$ 96,000	$ 4,273,012	$ -	$ 4,369,012	$ 5,554,514	$ 2,978,740	$ -	$ -	$ 5,554,514	$ -	$ 2,978,740			$ -	$ -	$ -	$ -	$ 226,825	$ 4,595,836	$ 6,263,653	$ 3,133,386	$ -	$ 309,139		$ -	$ 154,646	$ -	$ 6,263,653	$ 6,263,653	$ -	$ 3,133,386	$ 3,133,386
10	$ 36,000	$ 4,187,551	$ -	$ 4,223,551	$ 5,932,736	$ 3,153,613	$ 846,359	$ -	$ 5,932,736	$ -	$ 2,759,585			$ -	$ -	$ 65,488		$ 65,488	$ 4,889,040	$ 6,896,473	$ 3,194,401	$ -	$ 92,377		$ -	$ 42,789	$ -	$ 6,050,114	$ 6,896,473	$ -	$ 2,802,373	$ 3,194,401
11	$ 36,000	$ 4,103,800	$ -	$ 4,139,800	$ 5,813,983	$ 2,592,161	$ -	$ -	$ 6,043,983	$ -	$ 2,592,161							$ -	$ 4,139,800	$ 6,043,983	$ 2,592,161	$ -	$ -		$ -	$ -	$ -	$ 6,043,983	$ 6,043,983	$ -	$ 2,592,161	$ 2,592,161
12	$ 96,000	$ 4,021,724	$ -	$ 4,117,724	$ 5,222,164	$ 2,470,907	$ -	$ -	$ 6,222,164	$ -	$ 2,470,907							$ -	$ 4,117,724	$ 6,222,164	$ 2,470,907	$ -	$ -		$ -	$ -	$ -	$ 6,222,164	$ 6,222,164	$ -	$ 2,470,907	$ 2,470,907
13	$ 36,000	$ 3,941,290	$ -	$ 3,977,290	$ 6,220,307	$ 2,287,194	$ -	$ -	$ 6,220,307	$ -	$ 2,287,194							$ -	$ 3,977,290	$ 6,220,307	$ 2,287,194	$ -	$ -		$ -	$ -	$ -	$ 6,220,307	$ 6,220,307	$ -	$ 2,287,194	$ 2,287,194
14	$ 36,000	$ 3,862,464	$ -	$ 3,898,464	$ 6,310,423	$ 2,148,453	$ -	$ -	$ 6,310,423	$ -	$ 2,148,453							$ -	$ 3,898,464	$ 6,310,423	$ 2,148,453	$ -	$ -		$ -	$ -	$ -	$ 6,310,423	$ 6,310,423	$ -	$ 2,148,453	$ 2,148,453
15	$ 96,000	$ 3,785,215	$ -	$ 3,881,215	$ 7,507,598	$ 2,366,708	$ 1,005,209	$ -	$ 6,502,389	$ -	$ 2,049,824							$ -	$ 4,481,215	$ 7,507,598	$ 2,366,708	$ -	$ -		$ 1,005,209	$ 316,884	$ -	$ 6,502,389	$ 7,507,598	$ 316,884	$ 2,049,824	$ 2,366,708
16	$ 36,000	$ 3,709,511	$ -	$ 3,745,511	$ 6,494,663	$ 1,895,730	$ -	$ -	$ 6,494,663	$ -	$ 1,895,730							$ -	$ 3,745,511	$ 6,494,663	$ 1,895,730	$ -	$ -		$ -	$ -	$ -	$ 6,494,663	$ 6,494,663	$ -	$ 1,895,730	$ 1,895,730
17	$ 36,000	$ 3,635,320	$ -	$ 3,671,320	$ 6,588,829	$ 1,780,756	$ -	$ -	$ 6,588,829	$ -	$ 1,780,756							$ -	$ 3,671,320	$ 6,588,829	$ 1,780,756	$ -	$ -		$ -	$ -	$ -	$ 6,588,829	$ 6,588,829	$ -	$ 1,780,756	$ 1,780,756
18	$ 96,000	$ 3,562,614	$ -	$ 3,658,614	$ 6,795,836	$ 1,700,651	$ -	$ -	$ 6,795,836	*Capital*	*O&M*							$ -	$ 3,658,614	$ 6,795,836	$ 1,700,651	$ -	$ -	*Capital*	*O&M*	*Capital*	*O&M*	$ 6,795,836	*Capital*	*O&M*	$ 6,795,836	$ 1,700,651	$ 1,700,651	*Capital*	*O&M*
19	$ 36,000	$ 3,491,362	$ -	$ 3,527,362	$ 6,781,357	$ 1,571,322	$ -	$ -	$ 6,781,357	*20 yr PV*	*20 yr FV*							$ -	$ 3,527,362	$ 6,781,357	$ 1,571,322	$ -	$ -	*20 yr FV*	*20 yr FV*	*20 yr PV*	*20 yr FV*	$ 6,781,357	*20 yr PV*	*20 yr FV*	$ 6,781,357	$ 1,571,322	$ 1,571,322	*20 yr PV*	*20 yr PV*
20	$ 36,000	$ 3,421,534	$ -	$ 3,457,534	$ 8,073,637	$ 1,732,184	$ -	$ 1,193,873	$ 6,879,763	$ 42,824,000	$ 101,793,000			$ 256,143	$ -	$ 1,476,041	$ 30,647,000	$ 41,904,000	$ 4,057,534	$ 8,073,637	$ 1,732,184	$ -	$ -	$ 5,547,000	$ 1,829,000	$ -	$ -	$ 4,489,000	$ 1,114,000	$ 1,193,873	$ 6,879,763	$ 8,073,637	$ 48,373,000	$ 103,623,000	$ 256,143	$ 1,476,041	$ 1,732,184	$ 30,647,000	$ 41,904,000
21	$ 96,000	$ 3,353,104	$ -	$ 3,449,104	$ 7,103,193	$ 1,411,090	$ -	$ -	$ 7,103,193									$ -	$ 3,449,104	$ 7,103,193	$ 1,411,090	$ -	$ -								$ -	$ 1,411,090	$ 1,411,090		
22	$ 36,000	$ 3,286,042	$ -	$ 3,322,042	$ 7,080,970	$ 1,302,477	$ -	$ -	$ 7,080,970									$ -	$ 3,322,042	$ 7,080,970	$ 1,302,477	$ -	$ -								$ -	$ 1,302,477	$ 1,302,477		
23	$ 36,000	$ 3,220,321	$ -	$ 3,256,321	$ 7,183,817	$ 1,223,514	$ -	$ -	$ 7,183,817									$ -	$ 3,256,321	$ 7,183,817	$ 1,223,514	$ -	$ -								$ -	$ 1,223,514	$ 1,223,514		
24	$ 96,000	$ 3,155,914	$ -	$ 3,251,914	$ 7,425,189	$ 1,170,947	$ -	$ -	$ 7,425,189									$ -	$ 3,251,914	$ 7,425,189	$ 1,170,947	$ -	$ -								$ -	$ 1,170,947	$ 1,170,947		
25	$ 36,000	$ 3,092,796	$ -	$ 3,128,796	$ 8,812,059	$ 1,286,718	$ 1,417,947	$ -	$ 7,394,112	$ 207,046	$ 1,079,673							$ -	$ 3,728,796	$ 8,812,059	$ 1,286,718	$ -	$ -			$ 1,417,947	$ -	$ 7,394,112	$ 8,812,059	$ 207,046	$ 1,079,673	$ 1,286,718
26	$ 36,000	$ 3,030,940	$ -	$ 3,066,940	$ 7,501,609	$ 1,014,231	$ -	$ -	$ 7,501,609	$ -	$ 1,014,231							$ -	$ 3,066,940	$ 7,501,609	$ 1,014,231	$ -	$ -			$ -	$ -	$ 7,501,609	$ 7,501,609	$ -	$ 1,014,231	$ 1,014,231
27	$ 96,000	$ 2,970,321	$ -	$ 3,066,321	$ 7,762,598	$ 971,775	$ -	$ -	$ 7,762,598	$ -	$ 971,775							$ -	$ 3,066,321	$ 7,762,598	$ 971,775	$ -	$ -			$ -	$ -	$ 7,762,598	$ 7,762,598	$ -	$ 971,775	$ 971,775
28	$ 36,000	$ 2,910,915	$ -	$ 2,946,915	$ 7,721,424	$ 895,019	$ -	$ -	$ 7,721,424	$ -	$ 895,019							$ -	$ 2,946,915	$ 7,721,424	$ 895,019	$ -	$ -			$ -	$ -	$ 7,721,424	$ 7,721,424	$ -	$ 895,019	$ 895,019
29	$ 36,000	$ 2,852,697	$ -	$ 2,888,697	$ 7,833,793	$ 840,782	$ -	$ -	$ 7,833,793	$ -	$ 840,782							$ -	$ 2,888,697	$ 7,833,793	$ 840,782	$ -	$ -			$ -	$ -	$ 7,833,793	$ 7,833,793	$ -	$ 840,782	$ 840,782
30	$ 96,000	$ 2,795,643	$ -	$ 2,891,643	$ 8,116,245	$ 806,571	$ -	$ -	$ 8,116,245	$ -	$ 806,571							$ -	$ 2,891,643	$ 8,116,245	$ 806,571	$ -	$ -			$ -	$ -	$ 8,116,245	$ 8,116,245	$ -	$ 806,571	$ 806,571
	$ 34,875,000		$ 2,400,000	$ 135,798,506	$ 221,158,326	**$ 83,565,000**		$ 44,241,914	$ 176,916,412	$ 30,854,405	$ 52,710,229		$ -		$ 1,972,950	$ 341,081	$ 3,062,807	$ 1,120,000	$ 6,497,000	$ 142,295,000	**$ 228,535,000**	**$ 89,200,000**	**$ 5,547,000**	**$ 1,800,000**	$ 4,488,593	$ 1,114,256	$ 49,789,000	$ 178,745,000	**$ 228,535,000**	$ 35,300,000	$ 53,800,000	**$ 89,200,000**

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (following installation of additional wells)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. 30 years O&M for OU2 IRM
9. 30 years O&M for RW-400/-502 Plant
10. 4 diffusion wells for RW-400/RW-502 Plant located at the west end of VLSGC
11. O&M Costs for RW-400/-502 Plant, Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on ratio of new higher hp to old hp
* Assume Media Costs are increased by 100% (since flow rate will roughly triple and new flow will comervatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment media (PZ) will be required every 5 years in the IRM system and every 7.5 years in the RW-400/-502 system
13. Capital Costs
Years 1 and 2 - Install Groundwater Monitoring Wells, Extraction Wells, Diffusion Wells, and Piping
Years 2 - Install Treatment Plant at RW-400 (1/2)
Year 3 - Install Treatment Plant at RW-400 (1/2)

Table C-11. Cost Estimate for OU-2 Alternative 4e, LMC, Great Neck.

Outpost Monitoring
OU-2 IRM O&M (30 years)
Install 4 New Extraction Wells at VLSGC and NSLIJH and in OU-1 (RW300, RW401BM, RW401MM, and EW1D)
Install 4 New Diffusion Wells at VLSGC and NSLIJH South (DW300, DW301, DW404, and DW405)
Install 2 New 800-gpm Treatment Plants at MLWD and VLSGC
Operation of the New 800-gpm Treatment Plants
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Wells (4)					
1. RW300, RW401BM, RW401MM, and EW1D	4	ea	$ 875,000	$ 3,500,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing Basis: Diffusion Well Installation Costs per ARCADIS Principal Sci. rec'd
2. Well Access Fee	2	ea	$ 50,000	$ 100,000	Well access fee not required for EW1D, 2 locations
3. Well Permitting Fee	4	ea	$ 20,000	$ 80,000	
4. Piping from RW300 to VLSGC Treatment Plant	300	ft	$ 175	$ 52,500	Includes double-walled 8" HDPE piping, trenching and restoration
5. Piping from RW401BM and RW401MM toTreatment Plant	50	ft	$ 175	$ 8,750	
Subtotal				**$ 3,742,000**	
Install New Diffusion Wells (6)					
1. Drill and install Diffusion Wells	6	ea	$ 700,000	$ 4,200,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc. Bid to ARCADIS (11/07)
2A. Discharge Piping from Treatment Plant to DW300 and DW301	5,900	ft	$ 85	$ 500,648	Single-wall, 8" Blue Brute HDPE piping, trenching, and restoration. Est. from previous ARCADIS FS cost estimates plus inflation
2B. Discharge Piping from Treatment Plant to DW404 and DW405	3,500	ft	$ 85	$ 296,995	Same as above
3. Piping Appurtenances	2	ls	$ 30,000	$ 60,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
4. Additional Design & Permitting	2	ea	$ 50,000	$ 100,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	2	ea	$ 50,000	$ 100,000	Wells are installed on two properties
Subtotal				**$ 5,258,000**	
Install two 800-gpm Treatment Plants for RW300 and RW401					*Note: Basis of Below Costs, except as noted*
1. General Site Preperation	2	ea	$ 150,000	$ 300,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	2	ea	$ 75,000	$ 150,000	Foundation (incl. clearwells)
Building	7,600	ea	$ 250	$ 1,900,000	Two, 3,800 square foot buildings
HVAC	2	ea	$ 20,000	$ 40,000	
Soil transport.	2,000	cy	$ 6.62	$ 13,246	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	2	ls	$ 50,000	$ 100,000	
3. Major Process Equipment Items					
Air Stripping Tower	2	ea	$ 226,000	$ 452,000	
Off-gas Treatment Vessels, filled with media	2	ls	$ 372,000	$ 744,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in same config. As IRM); 56,000 lb PPZ x $1.10lb; 60,000 lb VPGAC x $1.20/lb est. from experience
Horizontal Mist Eliminator and Knock-Out Tank	2	ea	$ 11,000	$ 22,000	
Duct Heater	2	ea	$ 24,000	$ 48,000	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	4	ea	$ 21,000	$ 84,000	Assumes two 20 hp variable speed drive pumps. Est. from experience.
Filtration System	2	ls	$ 75,000	$ 150,000	Bag Filter System.
Ducting	2	ls	$ 169,000	$ 338,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	4	ea	$ 27,000	$ 108,000	50 Hp pump. Est. from experience.
Blower	4	ea	$ 32,000	$ 128,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation) plus installation.
4. Mechanical Components					
Extraction Well Piping Leak Detection System	350	ft	$ 25	$ 8,750	
Process Piping	2	ls	$ 50,000	$ 100,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	2	ls	$ 50,000	$ 100,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	2	ea	$ 90,000	$ 180,000	800 amp service
Power to Treatment Structure	200	ft	$ 100	$ 20,000	From source to treatment building
Conduit/Conductors to Well Vaults	350	ft	$ 35	$ 12,250	
Building Controls and Distribution	2	ea	$ 95,000	$ 190,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	2	ea	$ 95,000	$ 190,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	2	ls	$ 25,000	$ 50,000	Alarm system.
7. Mechanical Installation	100%	of	$ 2,282,750	$ 2,280,000	
8. Electrical Installation	25%	of	$ 642,250	$ 161,000	
9. Treatment System Operational Testing and Startup	2	ls	$ 10,000	$ 20,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	2	ea	$ 100,000	$ 200,000	
Subtotal				**$ 8,089,000**	
Subtotal of Capital Cost				**$ 19,089,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 19,089,000	$ 954,450	
2. Construction Management (7% of capital cost)	7%	of	$ 19,089,000	$ 1,336,230	
3. Project Management (10% of capital cost)	10%	of	$ 19,089,000	$ 1,908,900	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 19,089,000	$ 2,863,350	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 19,089,000	$ 1,646,426	
Subtotal				**$ 8,709,000**	
TOTAL CAPITAL COST				**$ 27,800,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(TWO New 800-gpm RW400, RW403, and RW404 Treatment Systems)					
GWTS Operations, Checklist and Inspections	2	ls	$ 256,000	$ 512,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	2	ls	$ 56,000	$ 112,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	2	ls	$ 80,000	$ 160,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.67	ls	$ 190,000	$ 127,300	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.67	ls	$ 210,000	$ 140,700	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	2	ls	$ 288,000	$ 576,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	2	ls	$ 120,000	$ 240,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	2	ls	$ 160,000	$ 320,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	2	ls	$ 28,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	2	ls	$ 157,500	$ 315,000	2010 spend for OU-2, increased by 5% for 800-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	2	ls	$ 32,000	$ 64,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	2	ls	$ 28,800	$ 57,600	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	2	ls	$ 44,000	$ 88,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 3,970,000**	

Table C-11. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost [1]	Monitoring Cost	OU-2 O&M Cost	OU-2 Capital Improvements	Pre-Escalated Cost	Escalated Cost (FV)	OU-2 PV (Cost)	OU-2 Capital FV	OU-2 O&M FV	OU-2 Capital NPV	OU-2 O&M NPV
1	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 2,961,135	$ 2,741,792	$ 1,506,960	$ 1,454,175	$ 1,395,333	$ 1,346,458
2	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 3,064,775	$ 2,627,550	$ 1,559,704	$ 1,505,071	$ 1,337,194	$ 1,290,356
3	$ 6,553,000	$ 96,000	$ 1,364,000		$ 8,013,000	$ 8,884,156	$ 7,052,530	$ 7,265,428	$ 1,618,728	$ 5,767,531	$ 1,284,999
4	$ 12,443,000	$ 36,000	$ 1,364,000		$ 13,843,000	$ 15,885,161	$ 11,676,067	$ 14,278,629	$ 1,606,532	$ 10,495,218	$ 1,180,849
5	$ 5,890,000	$ 36,000	$ 1,364,000		$ 7,290,000	$ 8,658,233	$ 5,892,648	$ 6,995,472	$ 1,662,761	$ 4,761,001	$ 1,131,647
6		$ 96,000	$ 3,970,000	$ -	$ 4,066,000	$ 4,998,152	$ 3,149,684	$ -	$ 4,998,152	$ -	$ 3,149,684
7		$ 36,000	$ 3,890,000	$ -	$ 3,926,000	$ 4,995,732	$ 2,914,961	$ -	$ 4,995,732	$ -	$ 2,914,961
8		$ 36,000	$ 3,812,788	$ -	$ 3,848,788	$ 5,068,119	$ 2,738,147	$ -	$ 5,068,119	$ -	$ 2,738,147
9		$ 96,000	$ 3,736,532	$ -	$ 3,832,532	$ 5,223,348	$ 2,612,974	$ -	$ 5,223,348	$ -	$ 2,612,974
10		$ 36,000	$ 3,661,802	$ 900,000	$ 4,597,802	$ 6,485,653	$ 3,004,112	$ 1,269,539	$ 5,216,114	$ 588,042	$ 2,416,070
11		$ 36,000	$ 3,588,566	$ -	$ 3,624,566	$ 5,291,756	$ 2,269,543	$ -	$ 5,291,756	$ -	$ 2,269,543
12		$ 96,000	$ 3,516,794	$ -	$ 3,612,794	$ 5,459,180	$ 2,167,916	$ -	$ 5,459,180	$ -	$ 2,167,916
13		$ 36,000	$ 3,446,458	$ -	$ 3,482,458	$ 5,446,412	$ 2,002,634	$ -	$ 5,446,412	$ -	$ 2,002,634
14		$ 36,000	$ 3,377,529	$ -	$ 3,413,529	$ 5,525,461	$ 1,881,204	$ -	$ 5,525,461	$ -	$ 1,881,204
15		$ 96,000	$ 3,309,979	$ 900,000	$ 4,305,979	$ 7,214,016	$ 2,774,159	$ 1,507,814	$ 5,706,202	$ 475,326	$ 1,798,833
16		$ 36,000	$ 3,243,779	$ -	$ 3,279,779	$ 5,687,091	$ 1,660,008	$ -	$ 5,687,091	$ -	$ 1,660,008
17		$ 36,000	$ 3,178,903	$ -	$ 3,214,903	$ 5,769,709	$ 1,559,373	$ -	$ 5,769,709	$ -	$ 1,559,373
18		$ 96,000	$ 3,115,325	$ -	$ 3,211,325	$ 5,965,002	$ 1,492,736	*Capital* *20 yr NPV*	*O&M* *20 yr NPV*	$ 1,492,736	*Capital* *20 yr NPV*	*O&M* *20 yr NPV*
19		$ 36,000	$ 3,053,019	$ -	$ 3,089,019	$ 5,938,643	$ 1,376,055	$ -	$ 5,938,643	$ -	$ 1,376,055
20		$ 36,000	$ 2,991,959	$ 900,000	$ 3,927,959	$ 7,815,808	$ 1,676,868	$ 1,790,810	$ 6,024,998	$ 384,215	$ 1,292,653
21		$ 96,000	$ 2,932,119	$ -	$ 3,028,119	$ 6,236,204	$ 1,238,858	$ -	$ 6,236,204	$ -	$ 1,238,858
22		$ 36,000	$ 2,873,477	$ -	$ 2,909,477	$ 6,201,584	$ 1,140,722	$ -	$ 6,201,584	$ -	$ 1,140,722
23		$ 36,000	$ 2,816,007	$ -	$ 2,852,007	$ 6,291,855	$ 1,071,599	$ -	$ 6,291,855	$ -	$ 1,071,599
24		$ 96,000	$ 2,759,687	$ -	$ 2,855,687	$ 6,520,472	$ 1,028,274	$ -	$ 6,520,472	$ -	$ 1,028,274
25		$ 36,000	$ 2,704,494	$ 900,000	$ 3,640,494	$ 8,603,378	$ 1,256,247	$ 2,126,920	$ 6,476,458	$ 310,568	$ 945,679
26		$ 36,000	$ 2,650,404	$ -	$ 2,686,404	$ 6,570,832	$ 888,388	$ -	$ 6,570,832	$ -	$ 888,388
27		$ 96,000	$ 2,597,396	$ -	$ 2,693,396	$ 6,818,512	$ 853,588	$ -	$ 6,818,512	$ -	$ 853,588
28		$ 36,000	$ 2,545,448	$ -	$ 2,581,448	$ 6,763,837	$ 784,021	$ -	$ 6,763,837	$ -	$ 784,021
29		$ 36,000	$ 2,494,539	$ -	$ 2,530,539	$ 6,862,512	$ 736,536	$ -	$ 6,862,512	$ -	$ 736,536
30		$ 96,000	$ 2,444,648	$ -	$ 2,540,648	$ 7,131,075	$ 708,667	$ -	$ 7,131,075	$ -	$ 708,667
	$ 27,798,000			$ 3,600,000	$ 118,620,251	$ 194,337,803	**$ 72,478,000**	$ 38,301,276	$ 156,037,000	$ 25,514,430	$ 46,963,434

Year	N12796 & N4388 Capital Cost	N12796 & N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Wellhead Pre-Escalated Cost	Wellhead Escalated Cost	Grand Total Pre-Escalated Cost	Grand Total Escalated Cost (FV)	Grand Total PV (Cost)
1					$ 1,515,500		$ 1,515,500	$ 1,568,543	$ 4,376,500	$ 4,529,678	$ 4,194,146
2					$ 1,515,500		$ 1,515,500	$ 1,623,441	$ 4,376,500	$ 4,688,216	$ 4,019,390
3					$ -	$ 160,000	$ 160,000	$ 177,395	$ 8,173,000	$ 9,061,551	$ 7,193,351
4			$ 939,500		$ -	$ 160,000	$ 1,099,500	$ 1,261,702	$ 14,942,500	$ 17,146,862	$ 12,603,456
5			$ 939,500		$ -	$ 160,000	$ 1,099,500	$ 1,305,861	$ 8,389,500	$ 9,964,094	$ 6,781,395
6			$ -	$ 71,000	$ 31,807	$ 160,000	$ 262,807	$ 323,057	$ 4,328,807	$ 5,321,209	$ 3,353,264
7			$ -	$ 69,580	$ -	$ 160,000	$ 229,580	$ 292,090	$ 4,156,180	$ 5,287,822	$ 3,085,393
8			$ -	$ 68,188	$ -	$ 160,000	$ 228,188	$ 300,481	$ 4,076,976	$ 5,368,599	$ 2,900,487
9			$ 93,950	$ 66,825	$ -	$ 160,000	$ 320,775	$ 437,183	$ 4,153,307	$ 5,660,531	$ 2,831,675
10			$ -	$ 65,488			$ 65,488	$ 92,377	$ 4,663,290	$ 6,578,031	$ 3,046,901
11			$ -	$ 64,178			$ 64,178	$ 93,698	$ 3,688,744	$ 5,385,454	$ 2,309,729
12			$ -	$ 62,895			$ 62,895	$ 95,038	$ 3,675,689	$ 5,554,219	$ 2,205,657
13			$ -	$ 61,637			$ 61,637	$ 96,397	$ 3,544,095	$ 5,542,809	$ 2,038,079
14			$ 93,950	$ 60,404			$ 154,354	$ 249,852	$ 3,567,883	$ 5,775,313	$ 1,966,269
15			$ -	$ 59,196			$ 59,196	$ 99,174	$ 4,365,175	$ 7,313,190	$ 2,305,423
16			$ -	$ 58,012			$ 58,012	$ 100,592	$ 3,337,791	$ 5,787,683	$ 1,689,370
17	$ 739,000		$ -	$ 56,852			$ 795,852	$ 1,428,296	$ 4,010,755	$ 7,198,005	$ 1,945,397
18	$ -	$ 100,000	$ -	$ 55,715			$ 155,715	$ 289,239	$ 3,367,040	$ 6,254,241	$ 1,565,118
19	$ -	$ 98,000	$ 93,950	$ 54,601			$ 246,551	$ 473,994	$ 3,335,569	$ 6,412,637	$ 1,485,885
20	$ -	$ 96,040	$ -	$ 53,509			$ 149,549	$ 297,570	$ 4,077,507	$ 8,113,378	$ 1,740,711
21	$ 36,950	$ 94,119	$ -	$ 52,438			$ 183,508	$ 377,921	$ 3,211,627	$ 6,614,126	$ 1,313,934
22	$ -	$ 92,237	$ -	$ 51,390			$ 143,626	$ 306,141	$ 3,053,103	$ 6,507,725	$ 1,197,034
23	$ -	$ 90,392	$ -	$ 50,362			$ 140,754	$ 310,519	$ 2,992,761	$ 6,602,374	$ 1,124,485
24	$ -	$ 88,584	$ 93,950	$ 49,355			$ 231,889	$ 529,478	$ 3,087,576	$ 7,049,950	$ 1,111,773
25	$ -	$ 86,813	$ -	$ 48,368			$ 135,180	$ 319,464	$ 3,775,674	$ 8,922,842	$ 1,302,895
26	$ 36,950	$ 85,076	$ -	$ 47,400			$ 169,426	$ 414,410	$ 2,855,830	$ 6,985,242	$ 944,417
27	$ -	$ 83,375	$ -	$ 46,452			$ 129,827	$ 328,666	$ 2,823,223	$ 7,147,177	$ 894,732
28	$ -	$ 81,707	$ -	$ 45,523			$ 127,230	$ 333,366	$ 2,708,678	$ 7,097,202	$ 822,663
29	$ -	$ 80,073	$ 93,950	$ 44,613			$ 218,636	$ 592,914	$ 2,749,175	$ 7,455,426	$ 800,172
30	$ -	$ 78,472	$ -	$ 43,720			$ 122,192	$ 342,968	$ 2,662,840	$ 7,474,043	$ 742,750
	$ 812,900	$ 1,154,888	$ 2,348,750	$ 1,407,700	$ 3,062,807	$ 1,120,000	$ 9,907,000	$ 14,462,000	$ 128,527,000	$ 208,800,000	**$ 79,500,000**

Wellhead FCV	Wellhead O&M FV	Wellhead NPV	Wellhead O&M NPV	Total FCV	Total O&M FV	Total FV	Total PV	Total NPV	Total O&M PV	Total PV
$ 1,568,543	$ -	$ 1,452,354	$ -	$ 3,075,503	$ 1,454,175	$ 4,529,678	$ 2,847,688	$ 1,346,458	$ 4,194,146	
$ 1,623,441	$ -	$ 1,391,839	$ -	$ 3,183,145	$ 1,505,071	$ 4,688,216	$ 2,729,034	$ 1,290,356	$ 4,019,390	
$ -	$ 177,395	$ -	$ 140,822	$ 7,265,428	$ 1,796,123	$ 9,061,551	$ 5,767,531	$ 1,425,820	$ 7,193,351	
$ 1,078,098	$ 183,604	$ 792,434	$ 134,954	$ 15,356,727	$ 1,790,136	$ 17,146,862	$ 11,287,652	$ 1,315,803	$ 12,603,456	
$ 1,115,831	$ 190,030	$ 759,416	$ 129,331	$ 8,111,304	$ 1,852,791	$ 9,964,094	$ 5,520,417	$ 1,260,978	$ 6,781,395	
$ 39,099	$ 283,958	$ 24,639	$ 178,942	$ 39,099	$ 5,282,110	$ 5,321,209	$ 24,639	$ 3,328,625	$ 3,353,264	
$ -	$ 292,090	$ -	$ 170,432	$ -	$ 5,287,822	$ 5,287,822	$ -	$ 3,085,393	$ 3,085,393	
$ -	$ 300,481	$ -	$ 162,340	$ -	$ 5,368,599	$ 5,368,599	$ -	$ 2,900,487	$ 2,900,487	
$ 128,044	$ 309,139	$ 64,054	$ 154,646	$ 128,044	$ 5,532,487	$ 5,660,531	$ 64,054	$ 2,767,621	$ 2,831,675	
$ -	$ 92,377	$ -	$ 42,789	$ 1,269,539	$ 5,308,492	$ 6,578,031	$ 588,042	$ 2,458,859	$ 3,046,901	
$ -	$ 93,698	$ -	$ 40,186	$ -	$ 5,385,454	$ 5,385,454	$ -	$ 2,309,729	$ 2,309,729	
$ -	$ 95,038	$ -	$ 37,741	$ -	$ 5,554,219	$ 5,554,219	$ -	$ 2,205,657	$ 2,205,657	
$ -	$ 96,397	$ -	$ 35,445	$ -	$ 5,542,809	$ 5,542,809	$ -	$ 2,038,079	$ 2,038,079	
$ 152,076	$ 97,776	$ 51,776	$ 33,289	$ 152,076	$ 5,623,237	$ 5,775,313	$ 51,776	$ 1,914,493	$ 1,966,269	
$ -	$ 99,174	$ -	$ 31,264	$ 1,507,814	$ 5,805,376	$ 7,313,190	$ 475,326	$ 1,830,097	$ 2,305,423	
$ -	$ 100,592	$ -	$ 29,362	$ -	$ 5,787,683	$ 5,787,683	$ -	$ 1,689,370	$ 1,689,370	
$ 1,326,265	$ 102,031	$ 358,448	$ 27,576	$ 1,326,265	$ 5,871,739	$ 7,198,005	$ 358,448	$ 1,586,949	$ 1,945,397	
$ -	$ 289,239	*Capital* *4,937,000*	*O&M* *1,553,000*	$ -	$ 72,382	$ 6,254,241	*Capital* *43,386,000*	*O&M* *93,557,000*	$ 1,565,118	*Capital* *30,141,000*	*O&M* *39,120,000*
$ 180,619	$ 293,375	*20 yr FV* $ 7,212,000	*20 yr FV* $ 3,394,000	$ 41,852	$ 67,978	*20 yr PV* $ 6,254,241	*20 yr FV* $ 43,386,000	*20 yr FV* $ 93,557,000	$ 41,852	*20 yr PV* $ 1,444,034	*20 yr PV* $ 1,485,885
$ -	$ 297,570			$ -	$ 63,843				$ 1,790,810	$ 6,322,568	$ 8,113,378	$ 384,215	$ 1,356,496	$ 1,740,711
$ -	$ 301,825			$ 15,117	$ 59,959				$ 1,298,817	$ 6,614,126	$ 15,117	$ 1,298,817	$ 1,313,934	
$ -	$ 306,141			$ -	$ 56,312				$ 6,507,725	$ 6,507,725	$ -	$ 1,197,034	$ 1,197,034	
$ -	$ 310,519			$ -	$ 52,886				$ 6,602,374	$ 6,602,374	$ -	$ 1,124,485	$ 1,124,485	
$ 214,519	$ 314,960			$ 33,829	$ 49,669				$ 6,835,432	$ 7,049,950	$ 33,829	$ 1,077,943	$ 1,111,773	
$ -	$ 319,464			$ -	$ 46,647				$ 2,126,920	$ 6,795,921	$ 8,922,842	$ 310,568	$ 992,326	$ 1,302,895
$ 90,378	$ 324,032			$ 12,219	$ 43,810				$ 90,378	$ 6,894,864	$ 6,985,242	$ 12,219	$ 932,198	$ 944,417
$ -	$ 328,666			$ -	$ 41,145				$ -	$ 7,147,177	$ 7,147,177	$ -	$ 894,732	$ 894,732
$ -	$ 333,366			$ -	$ 38,642				$ -	$ 7,097,202	$ 7,097,202	$ -	$ 822,663	$ 822,663
$ 254,781	$ 338,133			$ 27,345	$ 36,291				$ 254,781	$ 7,200,645	$ 7,455,426	$ 27,345	$ 772,827	$ 800,172
$ -	$ 342,968			$ -	$ 34,083				$ -	$ 7,474,043	$ 7,474,043	$ -	$ 742,750	$ 742,750
$ 7,848,000	**$ 6,614,000**	**$ 5,025,000**	**$ 2,013,000**	$ 46,149,000	$ 162,651,000	**$ 208,800,000**	$ 30,500,000	$ 49,000,000	**$ 79,516,000**		

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (following installation of additional wells)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. 30 years O&M for OU2 IRM
9. 30 years O&M for RW-400/-502 Plant
10. 4 diffusion wells for RW-400/RW-502 Plant located at the west end of VLSGC
11. O&M Costs for RW-400/-502 Plant, Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on ratio of new higher hp to old hp
* Assume Media Costs are increased by 100% (since flow rate will roughly triple and new flow will conservatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment media (PZ) will be required every 5 years in the IRM system and every 7.5 years in the RW-400/-502 system
13. Capital Costs
Years 1 and 2 - Install Groundwater Monitoring Wells, Extraction Wells, Diffusion Wells, and Piping
Years 2 - Install Treatment Plant at RW-400 (1/2)
Year 3 - Install Treatment Plant at RW-400 (1/2)

Table C-12. Cost Estimate for OU-2 Alternative 4f, LMC, Great Neck.

Outpost Monitoring
OU-2 IRM O&M (30 years)
Install 2 New Extraction Wells in Korean Church Parcel and OU-1 (RW404 and EW1D)
Install 4 New Diffusion Wells at NSLIJ and northwest of Deepdale Golf Club (DW404, DW405, DW409, and DW410)
Install a New 1,600-gpm Treatment System in the Korean Church Parcel
Operation of the New 1,600-gpm Treatment Plant
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Well and Piping					
1. Install RW404 in Korean Church Parcel and EW1D	2	ea	$ 875,000	$ 1,750,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing Basis: Diffusion Well Installation Costs per ARCADIS Principal Sci. rec'd
2. Well Access Fee	1	ea	$ 50,000	$ 50,000	
3. Well Permitting Fee	2	ea	$ 20,000	$ 40,000	
4. Piping from RW404 to Treatment System	25	ft	$ 175	$ 4,375	Includes double-walled 8" HDPE piping, trenching and restoration
Subtotal				**$ 1,845,000**	
Install New Diffusion Wells (4)					
1. Drill and install Diffusion Wells (DW404, DW405, DW409, and DW410)	4	ea	$ 700,000	$ 2,800,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc. Bid to ARCADIS (11/07)
2A. Discharge Piping from Treatment Plant to DW404 and DW405	3,700	ft	$ 85	$ 313,966	Single-wall, 8" Blue Brute PVC piping, trenching, and restoration. Est. from previous ARCADIS FS cost estimates plus inflation
2B. Discharge Piping from Treatment Plant to DW409 and DW410	5,000	ft	$ 85	$ 424,278	Single-wall, 8" Blue Brute PVC piping, trenching, and restoration. Est. from previous ARCADIS FS cost estimates plus inflation
3. Piping Appurtenances	2	ls	$ 30,000	$ 60,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
4. Additional Design & Permitting	2	ea	$ 50,000	$ 100,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	2	ea	$ 50,000	$ 100,000	Wells are installed on two properties
Subtotal				**$ 3,799,000**	
Install 1,600-gpm Treatment System					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	1	ea	$ 200,000	$ 200,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	1	ea	$ 100,000	$ 100,000	Foundation (incl. clearwells)
Building	5,400	sf	$ 250	$ 1,350,000	
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	1,250	cy	$ 6.62	$ 8,279	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 405,000	$ 405,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 665,000	$ 665,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in same config. As IRM); 56,000 lb PPZ x $1.10lb; 60,000 lb VPGAC x $1.20/lb est. from experience
Horizontal Mist Eliminator and Knock-Out Tank	2	ea	$ 15,000	$ 30,000	
Duct Heater	2	ea	$ 22,500	$ 45,000	
Clearwell Pumps	2	ea	$ 37,500	$ 75,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 130,000	$ 130,000	Bag Filter System.
Ducting	1	ls	$ 225,000	$ 225,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 37,500	$ 75,000	50 Hp pump. Est. from experience.
Blower	2	ea	$ 30,000	$ 60,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation) plus installation.
4. Mechanical Components					
Extraction Well Piping Leak Detection System	25	ft	$ 25	$ 625	
Process Piping	1	ls	$ 50,000	$ 50,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 65,000	$ 65,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	1	ea	$ 90,000	$ 90,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	25	ft	$ 35	$ 875	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 1,825,625	$ 1,830,000	
8. Electrical Installation	25%	of	$ 355,875	$ 89,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 5,964,000**	
Capital Cost Subtotal				**$ 13,608,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5.0%	of	$ 13,608,000	$ 680,400	
2. Construction Management (7% of capital cost)	7.0%	of	$ 13,608,000	$ 952,560	
3. Project Management (10% of capital cost)	10.0%	of	$ 13,608,000	$ 1,360,800	
4. Construction Contingency (Union Labor; 15% of capital cost)	15.0%	of	$ 13,608,000	$ 2,041,200	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 13,608,000	$ 1,173,690	
Subtotal				**$ 6,209,000**	
TOTAL CAPITAL COST				**$ 19,800,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 1,600-gpm RW404 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.67	ls	$ 190,000	$ 127,300	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.67	ls	$ 210,000	$ 140,700	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 576,000	$ 576,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 320,000	$ 320,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 210,000	$ 210,000	2010 spend for OU-2, increased by 40% for 1,600-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 3,220,000**	

Table C-12. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost [1]	Monitoring Cost	OU-2 O&M Cost	OU-2 Capital Improvements	Pre-Escalated Cost	Escalated Cost (FV)	PV (Cost)	OU-2 Capital FV	OU-2 O&M FV	OU-2 Capital NPV	OU-2 O&M NPV	Year	N1279& & N4388 Capital Cost	N1279& & N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Wellhead Pre-Escalated Cost	Total Pre-Escalated Cost	Total Escalated Cost (FV)	Total PV (Cost)	Wellhead FV	Wellhead O&M FV	Total FV	Wellhead Capital NPV	Wellhead O&M NPV	Total NPV	Total Capital FV	Total O&M FV	Total FV	Total Capital PV	Total O&M PV	Total NPV Cost	Total Capital FV	Total O&M FV
1	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 2,961,135	$ 2,741,792	$ 1,506,960	$ 1,454,175	$ 1,395,333	$ 1,346,458	1					$ 1,515,500		$ 1,515,500	$ 4,376,500	$ 4,529,678	$ 4,194,146	$1,568,543	$ -	$ 1,568,543	$ 1,452,354	$ -	$ 1,452,354	$ 3,075,503	$ 1,454,175	$ 4,529,678	$ 2,847,680	$ 1,346,458	$ 4,194,146	$ 3,075,503	$ 1,454,175
2	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 3,064,775	$ 2,627,550	$ 1,559,704	$ 1,505,071	$ 1,337,194	$ 1,290,356	2					$ 1,515,500		$ 1,515,500	$ 4,376,500	$ 4,688,216	$ 4,019,390	$1,623,441	$ -	$ 1,623,441	$ 1,391,839	$ -	$ 1,391,839	$ 3,183,145	$ 1,505,071	$ 4,688,216	$ 2,729,034	$ 1,290,356	$ 4,019,390	$ 3,183,145	$ 1,505,071
3	$ 4,110,000	$ 96,000	$ 1,364,000		$ 5,570,000	$ 6,175,559	$ 4,902,357	$ 4,556,830	$ 1,618,728	$ 3,617,359	$ 1,284,999	3					$ -	$ -	$ 160,000	$ 160,000	$ 5,730,000	$ 6,352,953	$ 5,043,179	$ -	$ -	$ 177,395	$ 177,395	$ -	$ 140,822	$ 140,822	$ 4,556,830	$ 1,796,123	$ 6,352,953	$ 3,617,359	$ 1,425,820	$ 5,043,179	$ 4,556,830	$ 1,618,728
4	$ 8,452,000	$ 36,000	$ 1,364,000		$ 9,852,000	$ 11,305,397	$ 8,309,804	$ 9,098,864	$ 1,606,532	$ 7,128,955	$ 1,180,849	4			$ 939,500		$ -	$ -	$ 160,000	$ 1,099,500	$ 10,951,500	$ 12,567,098	$ 9,237,192	$1,078,098	$ 183,604	$ 1,261,702	$ 792,434	$ 134,954	$ 927,388	$ 7,921,389	$ 1,315,803	$ 9,237,192	$ 9,098,864	$ 1,606,532	$ 10,705,396	$ 183,604	$ 1,790,136	$ 12,567,098	$ 7,921,389	$ 1,315,803	$ 9,237,192	$ 9,098,864	$ 1,606,532
5	$ 4,343,000	$ 36,000	$ 1,364,000		$ 5,743,000	$ 6,820,882	$ 4,642,178	$ 5,158,122	$ 1,662,761	$ 3,510,531	$ 1,131,647	5			$ 939,500		$ -	$ 31,807	$ 160,000	$ 1,131,307	$ 6,874,307	$ 8,164,520	$ 5,556,635	$1,153,608	$ 190,030	$ 1,343,638	$ 785,126	$ 129,331	$ 914,457	$ 6,311,729	$ 1,052,791	$ 8,164,520	$ 4,295,657	$ 1,260,978	$ 5,556,635	$ 5,158,122	$ 1,662,761
6		$ 96,000	$ 3,220,000	$ -	$ 3,316,000	$ 4,076,211	$ 2,568,704	$ -	$ -	$ -	$ -	6			$ -	$ -	$ 71,000	$ -	$ 160,000	$ 231,000	$ 3,547,000	$ 4,360,169	$ 2,747,646	$ -	$ -	$ 283,958	$ 283,958	$ -	$ 178,942	$ 178,942	$ -	$ 4,360,169	$ 4,360,169	$ 2,747,646	$ -	$ 2,747,646	$ -	$ 4,076,211
7		$ 36,000	$ 3,155,600	$ -	$ 3,191,600	$ 4,060,606	$ 2,369,325	$ -	$ -	$ -	$ 2,369,325	7			$ -	$ -	$ 69,580	$ -	$ 160,000	$ 229,580	$ 3,421,180	$ 4,352,696	$ 2,539,757	$ -	$ -	$ 292,090	$ 292,090	$ -	$ 170,432	$ 170,432	$ -	$ 4,352,696	$ 4,352,696	$ 2,539,757	$ -	$ 2,539,757	$ -	$ 4,060,606
8		$ 36,000	$ 3,092,488	$ -	$ 3,128,488	$ 4,119,621	$ 2,225,703	$ -	$ -	$ -	$ 2,225,703	8			$ -	$ -	$ 68,188	$ -	$ 160,000	$ 228,188	$ 3,356,676	$ 4,420,102	$ 2,388,043	$ -	$ -	$ 306,481	$ 306,481	$ -	$ 162,340	$ 162,340	$ -	$ 4,420,102	$ 4,420,102	$ 2,388,043	$ -	$ 2,388,043	$ -	$ 4,119,621
9		$ 96,000	$ 3,030,638	$ -	$ 3,126,638	$ 4,261,287	$ 2,131,704	$ -	$ -	$ -	$ 2,131,704	9			$ 93,950	$ -	$ 66,825	$ -	$ 160,000	$ 320,775	$ 3,447,413	$ 4,698,470	$ 2,350,405	$ 128,044	$ -	$ 309,139	$ 437,183	$ 64,054	$ -	$ 154,646	$ 218,700	$ 128,044	$ 6,379,139	$ 437,183	$ 64,054	$ 2,286,351	$ 2,350,405	$ 64,054	$ 2,286,351	$ 2,350,405	$ -	$ 4,261,287
10		$ 96,000	$ 2,970,055	$ 600,000	$ 3,666,055	$ 5,056,165	$ 2,356,106	$ 846,359	$ 4,240,296	$ 392,028	$ 1,964,077	10			$ -	$ -	$ -	$ -	$ 160,000	$ 225,488	$ 3,831,514	$ 5,404,728	$ 2,503,435	$ -	$ -	$ 318,073	$ 318,073	$ -	$ 147,329	$ 147,329	$ -	$ 5,404,728	$ 5,404,728	$ 2,503,435	$ 392,028	$ 2,111,407	$ 2,503,435	$ 846,359	$ 4,240,296	$ 5,086,655	$ -	$ 4,240,296
11		$ 36,000	$ 2,910,025	$ -	$ 2,946,025	$ 4,301,983	$ 1,845,047	$ -	$ -	$ -	$ 1,845,047	11			$ -	$ -	$ 64,178	$ -		$ 64,178	$ 3,010,803	$ 4,395,682	$ 1,885,233	$ -	$ -	$ 93,698	$ 93,698	$ -	$ 40,186	$ 40,186	$ -	$ 4,395,682	$ 4,395,682	$ 1,885,233	$ -	$ 1,885,233	$ -	$ 4,301,983											
12		$ 96,000	$ 2,852,412	$ -	$ 2,948,412	$ 4,455,254	$ 1,769,243	$ -	$ -	$ -	$ 1,769,243	12			$ -	$ -	$ 62,895	$ -		$ 62,895	$ 3,011,307	$ 4,550,292	$ 1,806,984	$ -	$ -	$ 95,038	$ 95,038	$ -	$ 37,741	$ 37,741	$ -	$ 4,550,292	$ 4,550,292	$ 1,806,984	$ -	$ 1,806,984	$ -	$ 4,455,254											
13		$ 36,000	$ 2,795,364	$ -	$ 2,831,364	$ 4,428,129	$ 1,628,214	$ -	$ -	$ -	$ 1,628,214	13			$ -	$ -	$ 61,637	$ -		$ 61,637	$ 2,893,001	$ 4,524,527	$ 1,663,659	$ -	$ -	$ 96,397	$ 96,397	$ -	$ 35,445	$ 35,445	$ -	$ 4,524,527	$ 4,524,527	$ 1,663,659	$ -	$ 1,663,659	$ -	$ 4,428,129											
14		$ 36,000	$ 2,739,457	$ -	$ 2,775,457	$ 4,492,617	$ 1,529,561	$ -	$ -	$ -	$ 1,529,561	14			$ 93,950	$ -	$ 60,404	$ -		$ 154,354	$ 3,929,811	$ 4,742,469	$ 1,614,626	$ 51,776	$ -	$ 97,776	$ 149,552	$ 51,776	$ 33,289	$ 85,065	$ 51,776	$ 4,742,469	$ 4,794,245	$ 1,614,626	$ 51,776	$ 1,562,850	$ 1,614,626	$ 51,776	$ 1,562,850	$ 1,614,626	$ -	$ 4,492,617											
15		$ 96,000	$ 2,684,668	$ -	$ 3,380,668	$ 5,663,798	$ 1,785,465	$ 1,005,209	$ 4,658,589	$ 316,884	$ 1,468,581	15			$ -	$ -	$ 59,196	$ -		$ 59,196	$ 3,439,864	$ 5,762,972	$ 1,816,729	$ -	$ -	$ 99,174	$ 99,174	$ -	$ 31,264	$ 31,264	$ 1,005,209	$ 4,757,763	$ 5,762,972	$ 1,816,729	$ 316,884	$ 1,499,845	$ 1,816,729	$ 1,005,209	$ 4,658,589	$ 5,663,798	$ -	$ 4,658,589											
16		$ 36,000	$ 2,630,974	$ -	$ 2,666,974	$ 4,624,496	$ 1,349,846	$ -	$ -	$ -	$ 1,349,846	16			$ -	$ -	$ 58,012	$ -		$ 58,012	$ 2,724,987	$ 4,725,089	$ 1,379,208	$ -	$ -	$ 102,551	$ 102,551	$ -	$ 29,362	$ 29,362	$ -	$ 4,725,089	$ 4,725,089	$ 1,379,208	$ -	$ 1,379,208	$ -	$ 4,624,496											
17		$ 36,000	$ 2,578,355	$ -	$ 2,614,355	$ 4,691,919	$ 1,268,080	$ -	$ -	$ -	$ 1,268,080	17			$ -	$ -	$ 56,852	$ -		$ 56,852	$ 2,671,207	$ 4,793,950	$ 1,295,656	$ -	$ -	$ 102,031	$ 102,031	$ -	$ 27,576	$ 27,576	$ -	$ 4,793,950	$ 4,793,950	$ 1,295,656	$ -	$ 1,295,656	$ -	$ 4,691,919											
18		$ 96,000	$ 2,526,788	$ -	$ 2,622,788	$ 4,871,800	$ 1,219,163	$ -	$ -	$ -	$ 1,219,163	*Capital*	*O&M*		$ -	$ -	$ 55,715	$ -		$ 55,715	$ 2,678,503	$ 4,975,290	$ 1,245,061	$ -	$ -	$ 103,490	$ 103,490	*Capital*	*O&M*		*Capital*	*O&M*		$ 4,975,290	$ 4,975,290	$ 1,245,061	*Capital*	*O&M*		*Capital*	*O&M*		$ 4,871,800	*Capital*	*O&M*
19		$ 36,000	$ 2,476,252	$ -	$ 2,512,252	$ 4,829,808	$ 1,119,125	$ -	$ -	$ -	$ 1,119,125	*20 yr FV*	*20 yr FV*		$ -	$ -	$ 54,601	$ -		$ 54,601	$ 3,399,803	$ 6,536,125	$ 1,514,499	$1,601,347	$ 104,970	$ 1,706,317	*20 yr FV*	*20 yr FV*		$ 371,052	$ 24,323	$ 395,374	*20 yr FV*	*20 yr FV*		$ 1,601,347	$ 4,934,778	$ 6,536,125	*20 yr FV*	*20 yr FV*		$ 371,052	$ 1,143,448	$ 1,514,499	*20 yr PV*	*20 yr PV*		$ 1,972,399	$ 4,934,778	$ 6,536,125	*20 yr PV*	*20 yr PV*		$ 371,052	$ 1,143,448	$ 1,514,499	*20 yr NPV*	*20 yr NPV*		$ 1,513,873	$ 4,829,808	*20 yr FV*	*20 yr FV*
20		$ 96,000	$ 2,426,727	$ 600,000	$ 3,062,727	$ 6,094,180	$ 1,307,495	$ 1,193,873	$ 4,900,307	*$ 48,910,000*	*$ 1,860,000*	$ 256,143	$ 1,051,352	*$ 17,954,000*	*$ 31,742,000*	20	$ -	$ -	$ 100,000	$ -	$ 53,509			$ 3,216,236	$ 6,399,630	$ 1,371,029	$ -	$ -	$ 305,450	$ 305,450	*$ 7,305,000*	*$ 3,253,000*	$ -	$ 65,534	$ 65,534	*$ 4,909,000*	*$ 1,569,000*	$ 1,193,873	$ 5,205,757	$ 6,399,630	*$ 32,831,000*	*$ 78,114,000*	$ 256,143	$ 1,116,886	$ 1,373,029	*$ 22,863,000*	*$ 33,311,000*	$ 256,143	$ 1,116,886	$ 1,373,029	######	######	$ 1,193,873	$ 4,900,307	######	######
21		$ 96,000	$ 2,378,193	$ -	$ 2,474,193	$ 5,095,430	$ 1,012,236	$ -	$ -	$ -	$ -	$ 5,095,430		21	$ -	$ -	$ 98,000	$ -	$ -	$ 52,438			$ 3,224,631	$ 5,405,248	$ 1,073,783	$ -	$ -	$ 309,818	$ 309,818	$ -	$ -	$ -	$ -	$ 5,405,248	$ 5,405,248	$ 1,073,783	$ -	$ 1,073,783	$ -	$ 5,095,430											
22		$ 36,000	$ 2,330,629	$ -	$ 2,366,629	$ 5,044,496	$ 927,887	$ -	$ -	$ -	$ -	$ 5,044,496		22	$ -	$ -	$ 96,040	$ -	$ -	$ 51,390			$ 3,274,671	$ 5,358,744	$ 985,690	$ -	$ -	$ 314,248	$ 314,248	$ -	$ -	$ -	$ -	$ 5,358,744	$ 5,358,744	$ 985,690	$ -	$ 985,690	$ -	$ 5,044,496											
23		$ 36,000	$ 2,284,016	$ -	$ 2,320,016	$ 5,118,221	$ 871,711	$ -	$ -	$ -	$ -	$ 5,118,221		23	$ 36,950	$ -	$ 94,119	$ -	$ -	$ 50,362			$ 3,501,447	$ 5,518,479	$ 939,881	$ -	$ 81,516	$ 318,742	$ 400,258	$ -	$ 13,883	$ 54,287	$ 68,170	$ -	$ 5,436,963	$ 5,518,479	$ 939,881	$ -	$ 13,883	$ 925,998	$ 939,881	$ -	$ 5,118,221											
24		$ 96,000	$ 2,238,336	$ -	$ 2,334,336	$ 5,330,055	$ 840,546	$ -	$ -	$ -	$ -	$ 5,330,055		24	$ -	$ -	$ 92,237	$ 93,950	$ -	$ 49,355			$ 235,541	$ 2,569,877	$ 5,867,874	$ 925,360	$ 214,519	$ 323,300	$ 537,818	$ -	$ 33,829	$ 50,984	$ 84,814	$ -	$ 5,641,174	$ 5,867,874	$ 925,360	$ -	$ 33,829	$ 891,530	$ 925,360	$ -	$ 5,330,055											
25		$ 36,000	$ 2,193,569	$ -	$ 2,829,569	$ 6,686,965	$ 976,417	$ 1,417,947	$ 5,269,018	$ 207,046	$ 769,371	25	$ -	$ -	$ 90,392	$ -	$ -	$ 48,368			$ 138,760	$ 2,968,329	$ 7,014,888	$ 1,024,299	$ -	$ -	$ 327,923	$ 327,923	$ -	$ -	$ 47,883	$ 47,883	$ -	$ 7,014,888	$ 7,014,888	$ 1,024,299	$ 207,046	$ 817,254	$ 1,024,299	$ 1,417,947	$ 5,269,018											
26		$ 36,000	$ 2,149,698	$ -	$ 2,185,698	$ 5,346,126	$ 722,806	$ -	$ -	$ -	$ -	$ 5,346,126		26	$ -	$ -	$ 88,584	$ -	$ -	$ 47,400			$ 135,984	$ 2,321,682	$ 5,678,738	$ 767,775	$ -	$ -	$ 332,612	$ 332,612	$ -	$ -	$ 44,970	$ 44,970	$ -	$ 5,678,738	$ 5,678,738	$ 767,775	$ -	$ 767,775	$ -	$ 5,346,126											
27		$ 96,000	$ 2,106,764	$ -	$ 2,202,764	$ 5,576,292	$ 698,078	$ -	$ -	$ -	$ -	$ 5,576,292		27	$ -	$ -	$ 86,813	$ -	$ -	$ 46,452			$ 133,265	$ 2,335,968	$ 5,913,661	$ 740,312	$ -	$ -	$ 337,369	$ 337,369	$ -	$ -	$ 42,234	$ 42,234	$ -	$ 5,913,661	$ 5,913,661	$ 740,312	$ -	$ 740,312	$ -	$ 5,576,292											
28		$ 36,000	$ 2,064,570	$ -	$ 2,100,570	$ 5,503,854	$ 637,972	$ -	$ -	$ -	$ -	$ 5,503,854		28	$ 36,950	$ -	$ 85,076	$ -	$ -	$ 45,523			$ 167,549	$ 2,268,119	$ 5,942,862	$ 688,859	$ 96,815	$ 342,193	$ 439,008	$ -	$ 11,222	$ 39,665	$ 50,887	$ -	$ 5,981,858	$ 5,942,862	$ 688,859	$ -	$ 11,222	$ 677,637	$ 688,859	$ -	$ 5,503,854											
29		$ 96,000	$ 2,023,278	$ -	$ 2,059,278	$ 5,584,511	$ 599,372	$ -	$ -	$ -	$ -	$ 5,584,511		29	$ -	$ -	$ 83,375	$ 93,950	$ -	$ 44,613			$ 221,937	$ 2,281,216	$ 6,186,379	$ 663,969	$ 254,781	$ 347,086	$ 601,867	$ -	$ 27,345	$ 37,252	$ 64,597	$ -	$ 6,250,976	$ 6,186,379	$ 663,969	$ -	$ 27,345	$ 636,624	$ 663,969	$ -	$ 5,584,511											
30		$ 96,000	$ 1,982,813	$ -	$ 2,078,813	$ 5,834,798	$ 579,847	$ -	$ -	$ -	$ -	$ 5,834,798		30	$ -	$ -	$ 81,707	$ -	$ -	$ 43,720			$ 125,428	$ 2,204,240	$ 6,186,848	$ 614,832	$ -	$ -	$ 352,050	$ 352,050	$ -	$ -	$ 34,986	$ 34,986	$ -	$ 6,186,848	$ 6,186,848	$ 614,832	$ -	$ 614,832	$ -	$ 5,834,798											
	$ 19,817,000			$ 2,400,000	$ 94,569,179	$ 155,506,863	$ 57,564,000	$ 26,943,869	$ 128,563,000	$ 18,161,474	$ 79,401,862		$ 812,900	$ 996,343	$ 2,348,750	$ 1,407,700	$ 3,062,807	$ 1,280,000	$ 9,909,000	$ 104,478,000	$ 170,018,000	$ 64,600,000	$7,953,000	$6,559,000	$ 14,500,000	$ 4,094,915	$ 2,041,023	$ 7,040,000	$ 34,098,658	$ 135,121,717	$ 170,020,000	$ 23,156,389	$ 41,442,885	$ 64,600,000	$ 23,200,000	##########	$ 64,600,000			

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (following installation of additional wells)
2. Every 3 years, annual sampling is required for 155 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. 30 years O&M for OU2 IRM
9. 30 years O&M for RW-400/-502 Plant
10. 4 diffusion wells for RW-400/RW-502 Plant located at the west end of YLSGC
11. O&M Costs for RW-400/-502 Plant, Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on ratio of new higher hp to old hp
* Assume Media Costs are increased by 100% (since flow rate will roughly triple and new flow will conservatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment media (PZ) will be required every 5 years in the IRM system and every 7.5 years in the RW-400/-502 system
13. Capital Costs
Years 1 and 2 - Install Groundwater Monitoring Wells, Extraction Wells, Diffusion Wells, and Piping
Years 2 - Install Treatment Plant at RW-400 (1/2)
Year 3 - Install Treatment Plant at RW-400 (1/2)

Table C-13. Cost Estimate for OU-2 Remedial Alternative 4g, Outpost Groundwater Monitoring, Continued Operation of the OU-2 IRM for 30 Years

Install 1 New Extraction Well into Basal Magothy at OU-1 (EW1D)
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Well					
1. EW1D Extraction Well Installation	1	ea	$ 875,000	$ 875,000	Typ. diffusion well cost + 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Permitting Fee	1	ea	$ 20,000	$ 20,000	
Subtotal of Capital Costs				**$ 895,000**	
Install New Diffusion Wells					
1. Drill and install 400-gpm Diffusion Wells	4	ea	$ 700,000	$ 2,800,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc. Bid
2. Discharge Piping (from Treatment System to Communty Drive, two Pipes)	2,000	ft	$ 110	$ 220,000	Single-wall, 8" Blue Brute HDPE piping, trenching, and restoration. Est. from previous
2a. Discharge Piping (from Community Drive to DWs, one Pipe)	6,200	ft	$ 85	$ 527,000	
3. Piping Appurtenances	2	ls	$ 30,000	$ 60,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
4. Additional Design & Permitting	2	ea	$ 50,000	$ 100,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	2	ea	$ 50,000	$ 100,000	
Subtotal				**$ 3,807,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 895,000	$ 44,750	
2. Construction Management (7% of capital cost)	7%	of	$ 895,000	$ 62,650	
3. Project Management (10% of capital cost)	10%	of	$ 895,000	$ 89,500	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 895,000	$ 134,250	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 895,000	$ 77,194	
Subtotal				**$ 409,000**	
TOTAL CAPITAL COST				**$ 5,111,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 1,200-gpm N5099 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.67	ls	$ 190,000	$ 127,300	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.67	ls	$ 210,000	$ 140,700	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 432,000	$ 432,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 240,000	$ 240,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 217,500	$ 217,500	2010 spend for OU-2, increased by 45% for 1,200-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 3,010,000**	

Table C-13. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

4h Year	Capital Cost [1]	Monitoring Cost	O&M Cost	Capital Improvement	OU-2 Total Pre-Escalated Cost	OU-2 Total Escalated Cost (FV)	OU-2 Total PV (Cost)	OU-2 Total Capital FV	OU-2 Total O&M FV	OU-2 Capital NPV	OU-2 O&M NPV
1	$ 2,556,000	$ 41,000	$ 1,364,000		$ 3,961,000	$ 4,099,635	$ 3,795,958	$ 2,645,460	$ 1,454,175	$ 2,449,500	$ 1,346,458
2	$ 2,556,000	$ 41,000	$ 1,364,000		$ 3,961,000	$ 4,243,122	$ 3,637,793	$ 2,738,051	$ 1,505,071	$ 2,347,438	$ 1,290,356
3		$ 96,000	$ 3,010,000	$ -	$ 3,106,000	$ 3,443,678	$ 2,733,702	$ -	$ 3,443,678	$ -	$ 2,733,702
4		$ 36,000	$ 2,949,800	$ -	$ 2,985,800	$ 3,426,274	$ 2,518,414	$ -	$ 3,426,274	$ -	$ 2,518,414
5		$ 36,000	$ 2,890,804	$ -	$ 2,926,804	$ 3,476,125	$ 2,365,792	$ -	$ 3,476,125	$ -	$ 2,365,792
6		$ 96,000	$ 2,832,988	$ -	$ 2,928,988	$ 3,600,474	$ 2,268,909	$ -	$ 3,600,474	$ -	$ 2,268,909
7		$ 36,000	$ 2,776,328	$ 300,000	$ 3,112,328	$ 3,959,751	$ 2,310,476	$ 381,684	$ 3,578,067	$ 222,709	$ 2,087,768
8		$ 36,000	$ 2,720,802	$ -	$ 2,756,802	$ 3,630,181	$ 1,961,274	$ -	$ 3,630,181	$ -	$ 1,961,274
9		$ 96,000	$ 2,666,386	$ -	$ 2,762,386	$ 3,764,848	$ 1,883,361	$ -	$ 3,764,848	$ -	$ 1,883,361
10		$ 36,000	$ 2,613,058	$ -	$ 2,649,058	$ 3,736,758	$ 1,730,842	$ -	$ 3,736,758	$ -	$ 1,730,842
11		$ 36,000	$ 2,560,797	$ -	$ 2,596,797	$ 3,791,245	$ 1,626,000	$ -	$ 3,791,245	$ -	$ 1,626,000
12		$ 96,000	$ 2,509,581	$ 300,000	$ 2,905,581	$ 4,390,532	$ 1,743,541	$ 453,321	$ 3,937,211	$ 180,020	$ 1,563,521
13		$ 36,000	$ 2,459,389	$ -	$ 2,495,389	$ 3,902,679	$ 1,435,007	$ -	$ 3,902,679	$ -	$ 1,435,007
14		$ 36,000	$ 2,410,201	$ -	$ 2,446,201	$ 3,959,653	$ 1,348,107	$ -	$ 3,959,653	$ -	$ 1,348,107
15		$ 96,000	$ 2,361,997	$ -	$ 2,457,997	$ 4,118,003	$ 1,298,166	$ -	$ 4,118,003	$ -	$ 1,298,166
16		$ 36,000	$ 2,314,757	$ -	$ 2,350,757	$ 4,076,181	$ 1,189,798	$ -	$ 4,076,181	$ -	$ 1,189,798
17		$ 36,000	$ 2,268,462	$ 300,000	$ 2,604,462	$ 4,674,165	$ 1,263,282	$ 538,403	$ 4,135,762	$ 145,514	$ 1,117,768
18		$ 96,000	$ 2,223,093	$ -	$ 2,319,093	$ 4,307,690	$ 1,077,995	$ -	$ 4,307,690	$ -	$ 1,077,995
19		$ 36,000	$ 2,178,631	$ -	$ 2,214,631	$ 4,257,631	$ 986,545	$ -	$ 4,257,631	$ -	$ 986,545
20		$ 36,000	$ 2,135,059	$ -	$ 2,171,059	$ 4,319,948	$ 926,837	$ -	$ 4,319,948	$ -	$ 926,837
21		$ 96,000	$ 2,092,357	$ -	$ 2,188,357	$ 4,596,772	$ 895,296	$ -	$ 4,596,772	$ -	$ 895,296
22		$ 36,000	$ 2,050,510	$ 300,000	$ 2,386,510	$ 5,086,874	$ 935,682	$ 639,453	$ 4,447,421	$ 117,621	$ 818,061
23		$ 36,000	$ 2,009,500	$ -	$ 2,045,500	$ 4,512,607	$ 768,566	$ -	$ 4,512,607	$ -	$ 768,566
24		$ 96,000	$ 1,969,310	$ -	$ 2,065,310	$ 4,715,781	$ 743,676	$ -	$ 4,715,781	$ -	$ 743,676
25		$ 36,000	$ 1,929,924	$ -	$ 1,965,924	$ 4,645,960	$ 678,393	$ -	$ 4,645,960	$ -	$ 678,393
26		$ 36,000	$ 1,891,325	$ -	$ 1,927,325	$ 4,714,158	$ 637,362	$ -	$ 4,714,158	$ -	$ 637,362
27		$ 96,000	$ 1,853,499	$ 300,000	$ 2,249,499	$ 5,694,757	$ 712,909	$ 759,470	$ 4,935,287	$ 95,076	$ 617,833
28		$ 36,000	$ 1,816,429	$ -	$ 1,852,429	$ 4,853,682	$ 562,608	$ -	$ 4,853,682	$ -	$ 562,608
29		$ 36,000	$ 1,780,100	$ -	$ 1,816,100	$ 4,925,042	$ 528,593	$ -	$ 4,925,042	$ -	$ 528,593
30		$ 96,000	$ 1,744,498	$ -	$ 1,840,498	$ 5,165,899	$ 513,373	$ -	$ 5,165,899	$ -	$ 513,373
	$ 5,112,000				$ 76,049,586	$ 128,001,000	**$ 45,079,000**	8,156,000	$ 119,845,000	$ 5,558,000	$ 39,521,000

Year	N12796 & N4388 Capital Cost	N12796 & N4389 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Welhead Pre-Escalated Cost	Total Pre-Escalated Cost	Total Escalated Cost (FV)	Total NPV Cost
1					$ 1,515,500		$ 1,515,500	$ 5,476,500	$ 5,668,178	$ 5,248,313
2					$ 1,515,500		$ 1,515,500	$ 5,476,500	$ 5,866,564	$ 5,029,633
3					$ -	$ 160,000	$ 160,000	$ 3,266,000	$ 3,621,073	$ 2,874,524
4			$ 6,809,000		$ -	$ 160,000	$ 6,969,000	$ 9,954,800	$ 11,423,362	$ 8,396,512
5			$ 6,809,000		$ 31,807	$ 160,000	$ 7,000,807	$ 9,927,611	$ 11,790,887	$ 8,024,680
6			$ -	$ 200,000	$ -	$ 160,000	$ 360,000	$ 3,288,988	$ 4,043,006	$ 2,547,780
7			$ -	$ 200,000	$ -	$ 160,000	$ 360,000	$ 3,472,328	$ 4,417,771	$ 2,577,727
8			$ 680,900	$ 200,000	$ -	$ 160,000	$ 1,040,900	$ 3,797,702	$ 5,000,848	$ 2,701,802
9			$ -	$ 200,000	$ -	$ 160,000	$ 360,000	$ 3,122,386	$ 4,255,491	$ 2,128,805
10			$ -	$ 200,000	$ 31,807	$ 160,000	$ 391,807	$ 3,040,865	$ 4,289,440	$ 1,986,841
11			$ -	$ 200,000	$ -	$ 160,000	$ 360,000	$ 2,956,797	$ 4,316,834	$ 1,851,416
12			$ -	$ 200,000	$ -	$ 160,000	$ 360,000	$ 3,265,581	$ 4,934,517	$ 1,959,564
13			$ 680,900	$ 200,000	$ -	$ 160,000	$ 1,040,900	$ 3,536,289	$ 5,530,601	$ 2,033,590
14			$ -	$ 200,000	$ -	$ 160,000	$ 360,000	$ 2,806,201	$ 4,542,383	$ 1,546,504
15			$ -	$ 200,000			$ 200,000	$ 2,657,997	$ 4,453,073	$ 1,403,794
16			$ -	$ 200,000			$ 200,000	$ 2,550,757	$ 4,422,978	$ 1,291,025
17	$ 739,000		$ -	$ 200,000			$ 939,000	$ 3,543,462	$ 6,359,365	$ 1,718,739
18	$ -	$ 100,000	$ 680,900	$ 200,000			$ 980,900	$ 3,299,993	$ 6,129,701	$ 1,533,952
19	$ -	$ 99,000	$ -	$ 200,000			$ 299,000	$ 2,513,631	$ 4,832,459	$ 1,119,739
20	$ -	$ 98,010	$ -	$ 200,000			$ 298,010	$ 2,469,069	$ 4,912,925	$ 1,054,059
21	$ 36,950	$ 97,030	$ -	$ 200,000			$ 333,980	$ 2,522,337	$ 5,194,581	$ 1,031,933
22	$ -	$ 96,060	$ -	$ 200,000			$ 296,060	$ 2,682,570	$ 5,717,929	$ 1,051,759
23	$ -	$ 95,099	$ 680,900	$ 200,000			$ 975,999	$ 3,021,499	$ 6,665,773	$ 1,135,283
24	$ -	$ 94,148	$ -	$ 200,000			$ 294,148	$ 2,359,458	$ 5,387,418	$ 849,592
25	$ -	$ 93,207	$ -	$ 200,000			$ 293,207	$ 2,259,130	$ 5,338,878	$ 779,572
26	$ 36,950	$ 92,274	$ -	$ 200,000			$ 329,224	$ 2,256,550	$ 5,519,427	$ 746,236
27	$ -	$ 91,352	$ -	$ 200,000			$ 291,352	$ 2,540,851	$ 6,432,334	$ 805,243
28	$ -	$ 90,438	$ 680,900	$ 200,000			$ 971,338	$ 2,823,767	$ 7,398,755	$ 857,617
29	$ -	$ 89,534	$ -	$ 200,000			$ 289,534	$ 2,105,634	$ 5,710,223	$ 612,864
30	$ -	$ 88,638	$ -	$ 200,000			$ 288,638	$ 2,129,137	$ 5,976,048	$ 593,884
	$ 812,900	$ 1,224,790	$ 17,022,500	$ 5,000,000	$ 3,094,614	$ 1,920,000	$ 29,075,000	$ 105,125,000	$ 170,153,000	**$ 65,493,000**

Year	Welhead Total Capital FV	Welhead Total O&M FV
1	$ 1,568,543	$ -
2	$ 1,623,441	$ -
3	$ -	$ 177,395
4	$ 7,813,484	$ 183,604
5	$ 5,529,556	$ 129,331
6	$ -	$ 278,870
7	$ -	$ 458,021
8	$ 484,413	$ 256,115
9	$ -	$ 490,643
10	$ 20,782	$ 235,217
11	$ -	$ 225,416
12	$ 453,321	$ 543,985
13	$ 391,561	$ 207,023
14	$ -	$ 582,730
15	$ -	$ 105,628
16	$ -	$ 101,227
17	$ 358,448	$ 97,009
18	$ 316,506	$ 139,450
19	$ -	$ 133,195
20	$ -	$ 127,222
21	$ 15,117	$ 121,520
22	$ -	$ 116,076
23	$ 255,838	$ 110,879
24	$ -	$ 105,917
25	$ -	$ 101,179
26	$ 12,219	$ 96,655
27	$ -	$ 92,335
28	$ 206,799	$ 88,210
29	$ -	$ 84,271
30	$ -	$ 80,510
	$ 27,180,302	$ 14,972,412

Year	Capital	O&M	20 yr PV	20 yr PV
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
	$ 23,720,000	**$ 7,905,000**	**$ 15,689,000**	**$3,239,000**

Year	Welhead Total Capital NPV	Welhead Total O&M NPV
1	$ 1,452,354	$ -
2	$ 1,391,839	$ -
3	$ -	$ 140,822
4	$ 5,743,144	$ 134,954
5	$ 5,529,556	$ 129,331
6	$ -	$ 278,870
7	$ -	$ 267,251
8	$ 484,413	$ 256,115
9	$ -	$ 245,444
10	$ 20,782	$ 235,217
11	$ -	$ 225,416
12	$ 453,321	$ 481,196
13	$ 391,561	$ 207,023
14	$ -	$ 198,397
15	$ -	$ 105,628
16	$ -	$ 101,227
17	$ 358,448	$ 97,009
18	$ 316,506	$ 139,450
19	$ -	$ 133,195
20	$ -	$ 127,222
21	$ 15,117	$ 121,520
22	$ -	$ 116,076
23	$ 255,838	$ 110,879
24	$ -	$ 105,917
25	$ -	$ 101,179
26	$ 12,219	$ 96,655
27	$ -	$ 92,335
28	$ 206,799	$ 88,210
29	$ -	$ 84,271
30	$ -	$ 80,510
	$ 16,179,000	$ 4,236,000

Year	Capital	O&M	20 yr PV	20 yr PV
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
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24				
25				
26				
27				
28				
29				
30				
	$ 30,485,000	**$ 80,327,000**		

Year	Total Capital FV	Total O&M FV	Total FV Cost
1	$ 4,214,003	$ 1,454,175	$ 5,668,178
2	$ 4,361,493	$ 1,505,071	$ 5,866,564
3	$ -	$ 3,621,073	$ 3,621,073
4	$ 7,813,484	$ 3,609,878	$ 11,423,362
5	$ 8,124,733	$ 3,666,155	$ 11,790,887
6	$ -	$ 4,043,006	$ 4,043,006
7	$ 381,684	$ 4,036,087	$ 4,417,771
8	$ 896,615	$ 4,104,233	$ 5,000,848
9	$ -	$ 4,255,491	$ 4,255,491
10	$ 44,867	$ 4,244,573	$ 4,289,440
11	$ -	$ 4,316,834	$ 4,316,834
12	$ 453,321	$ 4,481,196	$ 4,934,517
13	$ 1,064,898	$ 4,465,703	$ 5,530,601
14	$ -	$ 4,542,383	$ 4,542,383
15	$ -	$ 4,453,073	$ 4,453,073
16	$ -	$ 4,422,978	$ 4,422,978
17	$ 1,064,668	$ 4,494,697	$ 6,359,365
18	$ 1,264,764	$ 4,864,937	$ 6,129,701
19	$ -	$ 4,832,459	$ 4,832,459
20	$ -	$ 4,912,925	$ 4,912,925
21	$ 76,096	$ 5,118,485	$ 5,194,581
22	$ 639,453	$ 5,078,475	$ 5,717,929
23	$ 1,502,143	$ 5,163,629	$ 6,665,773
24	$ -	$ 5,387,418	$ 5,387,418
25	$ -	$ 5,338,878	$ 5,338,878
26	$ 90,378	$ 5,429,049	$ 5,519,427
27	$ 759,470	$ 5,672,864	$ 6,432,334
28	$ 1,784,075	$ 5,614,680	$ 7,398,755
29	$ -	$ 5,710,223	$ 5,710,223
30	$ -	$ 5,976,048	$ 5,976,048
	$ 35,336,000	**$ 134,817,000**	**$ 170,153,000**

Year	Capital	O&M	20 yr PV	20 yr PV
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
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22				
23				
24				
25				
26				
27				
28				
29				
30				
	$ 21,034,000	**$ 35,995,000**		

Year	Total NPV Cost
1	$ 3,901,854
2	$ 3,739,277
3	$ -
4	$ 5,743,144
5	$ 5,529,556
6	$ -
7	$ 222,709
8	$ 484,413
9	$ -
10	$ 20,782
11	$ -
12	$ 180,020
13	$ 391,561
14	$ -
15	$ -
16	$ -
17	$ 503,962
18	$ 316,506
19	$ -
20	$ -
21	$ 15,117
22	$ 117,621
23	$ 255,838
24	$ -
25	$ -
26	$ 12,219
27	$ 95,076
28	$ 206,799
29	$ -
30	$ -
	$ 21,736,000

Year	Total Capital NPV	Total O&M NPV	Total NPV Cost
1	$ 1,346,458	$ 3,901,854	$ 5,248,313
2	$ 1,290,356	$ 3,739,277	$ 5,029,633
3	$ 2,733,702	$ -	$ 2,874,524
4	$ 2,518,414	$ 5,743,144	$ 8,396,512
5	$ 2,365,792	$ 5,529,556	$ 8,024,680
6	$ 2,268,909	$ -	$ 2,547,780
7	$ 2,087,768	$ 222,709	$ 2,577,727
8	$ 1,961,274	$ 484,413	$ 2,701,802
9	$ 1,883,361	$ -	$ 2,128,805
10	$ 1,730,842	$ 20,782	$ 1,986,841
11	$ 1,626,000	$ -	$ 1,851,416
12	$ 1,563,521	$ 180,020	$ 1,959,564
13	$ 1,435,007	$ 391,561	$ 2,033,590
14	$ 1,348,107	$ -	$ 1,546,504
15	$ 1,298,166	$ -	$ 1,403,794
16	$ 1,189,798	$ -	$ 1,291,025
17	$ 1,117,768	$ 503,962	$ 1,718,739
18	$ 1,077,995	$ 316,506	$ 1,533,952
19	$ 986,545	$ -	$ 1,119,739
20	$ 926,837	$ -	$ 1,054,059
21	$ 895,296	$ 15,117	$ 1,031,933
22	$ 818,061	$ 117,621	$ 1,051,759
23	$ 768,566	$ 255,838	$ 1,135,283
24	$ 743,676	$ -	$ 849,592
25	$ 678,393	$ -	$ 779,572
26	$ 637,362	$ 12,219	$ 746,236
27	$ 617,833	$ 95,076	$ 805,243
28	$ 562,608	$ 206,799	$ 857,617
29	$ 528,593	$ 84,271	$ 612,864
30	$ 513,373	$ -	$ 593,884
	$ 39,521,000	$ 5,558,000	**$ 65,493,000**

[1] Installation of (5) new groundwater monitoring wells; upgrades to IRM system, installation of extraction wells and diffusion wells

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (after 5 additional wells are installed)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. Extracted water from RW-400 will be tied in with discharge from RW-100 prior to conveyance to the OU2 IRM system. No upgrades to the RW-100 to OU2 IRM header will be required.
9. 500-gpm OU2 treatment plant upgrade: Upgrade 2 clearwell transfer pumps, upgrade distribution trays for air stripper; do not need to upgrade VPGAC ECUs, PPZ ECUs or IRM discharge line to existing diffusion wells
10. For new diffusion wells, tie in piping about halfway from plant to existing wells
11. O&M Costs for Upgraded Plant: Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on flow rate ratio of new higher hp to old hp
* Assume VPGAC Media Costs are increased by 100% (since flow rate will roughly double and new flow will conservatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment PPZ media will be required 20% more often due to add inflow from well RW-300/400
13. Capital Upgrades:
Years 1 and 2 - Install New Groundwater Monitoring, Extraction and Diffusion Wells
Year 2 - Install Upgrades to IRM System and Connect Piping (Design will be performed during year 1)

Table C-14. Cost Estimate for OU-2 Alternative 4h, LMC, Great Neck.

Outpost Monitoring
OU-2 IRM O&M (30 years)
Install 2 New Extraction Wells at VLSGC (near Lakeview Road) and in OU-1 (RW300 and EW1D)
Install 2 New Diffusion Wells in VLSGC (DW300 and DW301)
Install New 500-gpm Treatment Plant near RW300
New 500-gpm Treatment Plant O&M
Install 4 New Groundwater Monitoring Wells into Basal Magothy
Install Replacement Well for N5099 and Pay for Operation of the System
Install New Remediation Well at N5099
Install New 1,200 gpm Treatment System at N5099
Operate N5099 at 1,200 gpm
Install and Operate Diffusion Wells at NSLIJH and in Macy's Parking Lot

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Wells (RW300 and EW1D)					
1. RW300 and EW1D	2	ea	$ 875,000	$ 1,750,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing Basis: Diffusion Well Installation Costs per ARCADIS Principal Sci. rec'd
2. Well Access Fee	1	ea	$ 50,000	$ 50,000	Well access fee not required for EW1D
3. Well Permitting Fee	2	ea	$ 20,000	$ 40,000	
Subtotal				**$ 1,840,000**	
Install New Diffusion Wells (DW300, DW301, NSLIJH, and Macy's)					
1. Drill and install 400-gpm Diffusion Wells	6	ea	$ 700,000	$ 4,200,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc. Bid to ARCADIS (11/07)
2. Discharge Piping from VLSGC System to DW300 and DW301	5,000	ft	$ 85	$ 425,000	Single-wall, 8" Blue Brute HDPE piping, trenching, and restoration. Est. from previous ARCADIS FS cost estimates with inflation.
2a. Discharge Piping (from Treatment System to Communty Drive, two Pipes)	2,000	ft	$ 110	$ 220,000	Single-wall, 8" Blue Brute HDPE piping, trenching, and restoration. Est. from previous ARCADIS FS cost estimates with inflation.
2b. Discharge Piping (from Community Drive to DWs, one Pipe)	6,200	ft	$ 85	$ 527,000	
3. Piping Appurtenances	3	ls	$ 30,000	$ 90,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
4. Additional Design & Permitting	3	ea	$ 50,000	$ 150,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	3	ea	$ 50,000	$ 150,000	
Subtotal				**$ 5,762,000**	
Install 500 gpm Treatment Plant for RW300					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	1	ls	$ 150,000	$ 150,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	1	ea	$ 75,000	$ 75,000	Foundation (incl. clearwells)
Building	3,000	lf	$ 250	$ 750,000	Cost based on RTKL architect's estimate
HVAC	1	ea	$ 20,000	$ 20,000	
Soil transport.	1,000	cy	$ 6.62	$ 6,623	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 50,000	$ 50,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 226,000	$ 226,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 372,000	$ 372,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in same config. As IRM); 56,000 lb PPZ x $1.10lb; 60,000 lb VPGAC x $1.20/lb est. from
Horizontal Mist Eliminator and Knock-Out Tank	1	ea	$ 11,000	$ 11,000	
Duct Heater	1	ea	$ 24,000	$ 24,000	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	2	ea	$ 21,000	$ 42,000	Assumes two 20 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 75,000	$ 75,000	Bag Filter System.
Ducting	1	ls	$ 169,000	$ 169,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 27,000	$ 54,000	50 Hp pump. Est. from experience.
Blower	1	ea	$ 32,000	$ 32,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation) plus installation.
4. Mechanical Components					
Piping from Extraction Well to Treatment Plant	300	ft	$ 175	$ 52,500	Includes double-walled 8" HDPE piping, trenching and restoration.
Extraction Well Piping Leak Detection System	300	ft	$ 25	$ 7,500	
Process Piping	1	ls	$ 115,000	$ 115,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 75,000	$ 75,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	1	ea	$ 90,000	$ 90,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	300	ft	$ 35	$ 10,500	
Building Controls and Distribution	1	ea	$ 95,000	$ 95,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 95,000	$ 95,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 1,255,000	$ 1,260,000	
8. Electrical Installation	25%	of	$ 325,500	$ 81,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 10,000	$ 10,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	0	ea	$ 100,000	$ -	
Subtotal				**$ 3,983,000**	
Subtotal of Capital Cost				**$ 13,585,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 13,585,000	$ 679,250	
2. Construction Management (7% of capital cost)	7%	of	$ 13,585,000	$ 950,950	
3. Project Management (10% of capital cost)	10%	of	$ 13,585,000	$ 1,358,500	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 13,585,000	$ 2,037,750	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 13,585,000	$ 1,171,706	
Subtotal				**$ 6,198,000**	
TOTAL CAPITAL COST				**$ 19,800,000**	

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a estiimate
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 500-gpm RW300 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a estiimate
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 1,200-gpm N5099 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.67	ls	$ 190,000	$ 127,300	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.67	ls	$ 210,000	$ 140,700	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 432,000	$ 432,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 240,000	$ 240,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 217,500	$ 217,500	2010 spend for OU-2, increased by 45% for 1,200-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 4,180,000**	

Table C-14. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost	Monitoring Cost	OU-2 O&M Cost	OU-2 Capital Improvements	OU-2 Pre-Escalated Cost	OU-2 Escalated Cost (FV)	OU-2 PV (Cost)	OU-2 Total Capital FV	OU-2 Total O&M FV		OU-2 Total Capital PV	OU-2 Total O&M PV		N12796 & N4388 Year	N12796 & N4388 Capital Cost	N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M	Welhead Pre-Escalated Cost	Total Pre-Escalated Cost	Total Escalated Cost (FV)	Total PV (Cost)	Welhead Total Capital FV	Welhead Total O&M FV		Welhead Total Capital PV	Welhead Total O&M PV		Welhead Total PV	Total Capital FV	Total O&M FV	Total FV	Total Capital NPV	Total O&M NPV	Total NPV
1	$ 11,908,000	$ 41,000	$ 1,364,000		$ 13,313,000	$ 13,778,955	$ 12,758,292	$ 12,324,780	$ 1,454,175		$ 11,411,833	$ 1,346,458		2011	1					$ 1,515,500	$ 1,515,500	$ 14,828,500	$ 15,347,498	$ 14,210,646	$ 1,568,543	$ -		$ 1,452,354	$ -		$ 1,454,175	$ 15,347,498		$ 13,893,323	$ 1,346,458	$ 15,347,498	$ 12,864,188	$ 1,346,458	$ 14,210,646
2	$ 4,976,000	$ 41,000	$ 1,364,000		$ 6,381,000	$ 6,835,487	$ 5,860,328	$ 5,330,416	$ 1,505,071		$ 4,569,972	$ 1,290,356		2012	2					$ 1,515,500	$ 1,515,500	$ 7,896,500	$ 8,458,928	$ 7,252,168	$ 1,623,441	$ -		$ 1,391,839	$ -		$ 1,391,839	$ 8,458,928		$ 6,953,857	$ 1,505,071	$ 8,458,928	$ 5,961,812	$ 1,290,356	$ 7,252,168
3	$ 2,901,000	$ 96,000	$ 1,364,000		$ 4,361,000	$ 4,835,119	$ 3,838,273	$ 3,216,391	$ 1,618,728		$ 2,553,275	$ 1,284,999		2013	3					$ -	$ 160,000	$ 4,521,000	$ 5,012,514	$ 3,979,095	$ -	$ 177,395		$ -	$ 140,822		$ 140,822	$ 5,012,514		$ 3,216,391	$ 1,796,123	$ 5,012,514	$ 2,553,275	$ 1,425,820	$ 3,979,095
4		$ 36,000	$ 4,180,000	$ -	$ 4,216,000	$ 4,837,957	$ 3,556,043	$ -	$ 4,837,957		$ -	$ 3,556,043		2014	4			$ 6,809,000		$ -	$ 160,000	$ 11,185,000	$ 12,835,045	$ 9,434,141	$ 7,813,484	$ 183,604		$ 5,743,144	$ 134,954		$ 5,878,098	$ 12,835,045		$ 7,813,484	$ 5,021,561	$ 12,835,045	$ 5,743,144	$ 3,690,997	$ 9,434,141
5		$ 36,000	$ 4,096,400	$ -	$ 4,132,400	$ 4,907,995	$ 3,340,299	$ -	$ 4,907,995		$ -	$ 3,340,299		2015	5			$ 6,809,000		$ -	$ 160,000	$ 7,000,807	$ 11,133,207	$ 13,222,757	$ 8,999,186	$ 8,124,733	$ 190,030		$ 5,529,556	$ 129,331		$ 5,658,888	$ 13,222,757		$ 8,124,733	$ 5,098,025	$ 13,222,757	$ 5,529,556	$ 3,469,630	$ 8,999,186
6		$ 96,000	$ 4,014,472	$ -	$ 4,110,472	$ 5,052,820	$ 3,184,133	$ -	$ 5,052,820		$ -	$ 3,184,133		2016	6		$ -	$ 200,000	$ -	$ -	$ 160,000	$ 360,000	$ 4,470,472	$ 5,495,352	$ 3,463,004	$ 442,532		$ -	$ 278,870		$ 278,870	$ 5,495,352		$ -	$ 3,463,004	$ 5,495,352	$ -	$ 3,463,004	$ 3,463,004
7		$ 36,000	$ 3,934,183	$ -	$ 3,970,183	$ 5,051,181	$ 2,947,316	$ -	$ 5,051,181		$ -	$ 2,947,316		2017	7		$ -	$ -	$ -	$ -	$ 160,000	$ 360,000	$ 4,330,183	$ 5,509,201	$ 3,214,566	$ 458,021		$ -	$ 267,251		$ 267,251	$ 5,509,201		$ -	$ 3,214,566	$ 5,509,201	$ -	$ 3,214,566	$ 3,214,566
8		$ 36,000	$ 3,855,499	$ 600,000	$ 4,491,499	$ 5,914,446	$ 3,195,391	$ 790,085	$ 5,124,361		$ 426,859	$ 2,768,533		2018	8		$ -	$ 275,900	$ -	$ 200,000	$ -	$ 635,900	$ 5,127,399	$ 6,751,805	$ 3,647,790	$ 363,308	$ 474,051		$ 196,284	$ 256,115		$ 452,399	$ 6,751,805		$ 1,153,393	$ 5,598,412	$ 6,751,805	$ 623,142	$ 3,024,648	$ 3,647,790
9		$ 96,000	$ 3,778,389	$ -	$ 3,874,389	$ 5,280,394	$ 2,641,512	$ -	$ 5,280,394		$ -	$ 2,641,512		2019	9		$ -	$ 275,900	$ -	$ 200,000	$ -	$ 635,900	$ 4,234,389	$ 5,771,037	$ 2,886,956	$ -	$ 490,643		$ -	$ 245,444		$ 245,444	$ 5,771,037		$ -	$ 2,886,956	$ 5,771,037	$ -	$ 2,886,956	$ 2,886,956
10		$ 36,000	$ 3,702,821	$ -	$ 3,738,821	$ 5,273,976	$ 2,442,872	$ -	$ 5,273,976		$ -	$ 2,442,872		2020	10		$ -	$ 200,000	$ 31,807	$ 160,000	$ 391,807	$ 4,130,628	$ 5,826,659	$ 2,698,870	$ -	$ 507,816		$ 44,867	$ 20,782		$ 235,217	$ 255,999		$ 44,867	$ 5,781,792	$ 5,826,659	$ 20,782	$ 2,678,088	$ 2,698,870
11		$ 36,000	$ 3,628,765	$ -	$ 3,664,765	$ 5,350,446	$ 2,294,714	$ -	$ 5,350,446		$ -	$ 2,294,714		2021	11		$ -	$ 200,000	$ -	$ 160,000	$ 360,000	$ 4,024,765	$ 5,876,035	$ 2,520,131	$ -	$ 525,589		$ -	$ 225,416		$ 225,416	$ 5,876,035		$ -	$ 2,520,131	$ 5,876,035	$ -	$ 2,520,131	$ 2,520,131
12		$ 36,000	$ 3,556,189	$ -	$ 3,592,189	$ 5,518,709	$ 2,191,555	$ -	$ 5,518,709		$ -	$ 2,191,555		2022	12		$ -	$ 200,000	$ -	$ 160,000	$ 360,000	$ 4,012,189	$ 6,062,694	$ 2,407,579	$ -	$ 543,985		$ -	$ 216,024		$ 216,024	$ 6,062,694		$ -	$ 2,407,579	$ 6,062,694	$ -	$ 2,407,579	$ 2,407,579
13		$ 36,000	$ 3,485,066	$ 600,000	$ 4,121,066	$ 6,445,166	$ 2,369,874	$ 938,374	$ 5,506,792		$ 345,038	$ 2,024,836		2023	13		$ -	$ 275,900	$ -	$ 200,000	$ -	$ 475,900	$ 4,596,966	$ 7,189,452	$ 2,643,547	$ 431,495	$ 312,791		$ -	$ 158,660		$ 115,013	$ 273,673		$ 1,369,869	$ 5,819,583	$ 7,189,452	$ 503,698	$ 2,139,849	$ 2,643,547
14		$ 36,000	$ 3,415,364	$ -	$ 3,451,364	$ 5,586,705	$ 1,902,055	$ -	$ 5,586,705		$ -	$ 1,902,055		2024	14		$ -	$ -	$ -	$ 200,000	$ -	$ 200,000	$ 3,651,364	$ 5,910,443	$ 2,012,276	$ -	$ 323,739		$ -	$ -		$ 110,220	$ 110,220		$ -	$ 5,910,443	$ 5,910,443	$ -	$ 2,012,276	$ 2,012,276
15		$ 96,000	$ 3,347,057	$ -	$ 3,443,057	$ 5,768,322	$ 1,818,416	$ -	$ 5,768,322		$ -	$ 1,818,416		2025	15		$ -	$ -	$ -	$ 200,000	$ -	$ 200,000	$ 3,643,057	$ 6,103,391	$ 1,924,043	$ -	$ 335,070		$ -	$ -		$ 105,628	$ 105,628		$ -	$ 6,103,391	$ 6,103,391	$ -	$ 1,924,043	$ 1,924,043
16		$ 36,000	$ 3,286,116	$ -	$ 3,322,116	$ 5,750,099	$ 1,678,399	$ -	$ 5,750,099		$ -	$ 1,678,399		2026	16	$ 739,000				$ 200,000	$ -	$ 939,000	$ 4,255,116	$ 7,378,312	$ 2,153,659	$ 1,281,416	$ 346,797		$ 374,033	$ 101,227		$ 475,260	$ 7,378,312		$ 1,281,416	$ 6,096,895	$ 7,378,312	$ 374,033	$ 1,779,626	$ 2,153,659
17		$ 36,000	$ 3,214,514	$ -	$ 3,250,514	$ 5,833,617	$ 1,576,646	$ -	$ 5,833,617		$ -	$ 1,576,646		2027	17	$ -	$ 100,000	$ -	$ 200,000	$ -	$ 300,000	$ 3,550,514	$ 6,372,020	$ 1,722,159	$ -	$ 538,403		$ -	$ 145,514		$ 145,514	$ 6,372,020		$ -	$ 6,372,020	$ 6,372,020	$ -	$ 1,722,159	$ 1,722,159
18		$ 96,000	$ 3,150,223	$ 600,000	$ 3,846,223	$ 7,144,318	$ 1,707,859	$ 1,114,494	$ 6,029,825	*Capital*	$ 278,901	$ 1,508,958	*Capital*	*O&M*	2028	18	$ -	$ 99,000	$ 275,900	$ 200,000	$ -	$ 574,900	$ 4,421,123	$ 7,812,189	$ 2,055,092	$ 512,481	$ 555,389	*Capital*	*O&M*	$ 128,248	$ 138,986		$ 267,234	*Capital*	*O&M*	$ 1,626,975	$ 6,585,214	$ 8,212,189	*Capital*	*O&M*	$ 2,055,092
19		$ 36,000	$ 3,087,219	$ -	$ 3,123,219	$ 6,004,392	$ 1,391,290	$ -	$ 6,004,392	*20 yr FV*	$ -	$ 1,391,290	*20 yr NPV*	*20 yr NPV*	2029	19	$ -	$ 98,010	$ -	$ 200,000	$ -	$ 298,010	$ 3,421,229	$ 6,577,317	$ 1,524,044	$ -	$ 572,925	*20 yr FV*	*20 yr FV*	$ -	$ 132,754		$ 132,754	*20 yr PV*	*20 yr PV*	$ -	$ 6,577,317	$ 6,577,317	*20 yr FV*	*20 yr FV*	$ 1,524,044
20		$ 36,000	$ 3,025,474	$ -	$ 3,061,474	$ 6,091,688	$ 1,306,961	$ -	$ 6,091,688	$ *23,715,000*	$ -	$ 1,306,961	$ *19,586,000*	$ *42,496,000*	2030	20	$ 36,950	$ 97,030	$ -	$ 200,000	$ -	$ 333,980	$ 3,395,454	$ 6,756,237	$ 1,449,539	$ 73,523	$ 591,027	$ *21,837,000*	$ *7,370,000*	$ 15,774	$ 126,804		$ 142,578	$ *15,011,000*	$ *3,106,000*	$ 73,523	$ 6,882,715	$ 6,956,237	$ *45,552,000*	$ *105,117,000*	$ 15,774	$ 1,433,764	$ 1,449,539	$ *34,597,000*	$ *45,402,000*
21		$ 96,000	$ 2,964,965	$ -	$ 3,060,965	$ 6,303,848	$ 1,252,296	$ -	$ 6,303,848		$ -	$ 1,252,296			2031	21	$ -	$ 96,060	$ -	$ 200,000	$ -	$ 296,060	$ 3,357,025	$ 6,913,562	$ 1,373,419	$ -	$ 609,714		$ -	$ 121,123		$ 121,123	$ 6,913,562		$ -	$ 6,913,562	$ 6,913,562	$ -	$ 1,373,419	$ 1,373,419
22		$ 36,000	$ 2,905,666	$ -	$ 2,941,666	$ 6,270,194	$ 1,153,343	$ -	$ 6,270,194		$ -	$ 1,153,343			2032	22	$ -	$ 95,099	$ -	$ 200,000	$ -	$ 295,099	$ 3,236,765	$ 6,899,201	$ 1,269,043	$ -	$ 629,007		$ -	$ 115,700		$ 115,700	$ 6,899,201		$ -	$ 6,899,201	$ 6,899,201	$ -	$ 1,269,043	$ 1,269,043
23		$ 36,000	$ 2,847,552	$ -	$ 2,883,552	$ 6,461,447	$ 1,308,893	$ 1,323,669	$ 6,361,447		$ 225,441	$ 1,083,452			2033	23	$ -	$ 94,148	$ 275,900	$ 200,000	$ -	$ 570,048	$ 4,053,600	$ 8,942,707	$ 1,523,080	$ 608,667	$ 648,924		$ 103,665	$ 110,522		$ 214,187			$ 1,932,336	$ 7,010,371	$ 8,942,707	$ 329,106	$ 1,193,973	$ 1,523,080
24		$ 96,000	$ 2,790,601	$ -	$ 2,886,601	$ 6,591,059	$ 1,039,406	$ -	$ 6,591,059		$ -	$ 1,039,406			2034	24	$ -	$ 93,207	$ -	$ 200,000	$ -	$ 293,207	$ 3,179,808	$ 7,260,546	$ 1,144,983	$ -	$ 669,487		$ -	$ 105,578		$ 105,578	$ 7,260,546		$ -	$ 7,260,546	$ 7,260,546	$ -	$ 1,144,983	$ 1,144,983
25		$ 36,000	$ 2,734,789	$ -	$ 2,770,789	$ 6,548,054	$ 956,133	$ -	$ 6,548,054		$ -	$ 956,133			2035	25	$ 36,950	$ 92,274	$ -	$ 200,000	$ -	$ 329,224	$ 3,100,014	$ 7,326,092	$ 1,069,741	$ 87,322	$ 690,716		$ 12,751	$ 100,857		$ 113,607			$ 87,322	$ 7,238,770	$ 7,326,092	$ 12,751	$ 1,056,990	$ 1,069,741
26		$ 36,000	$ 2,680,094	$ -	$ 2,716,094	$ 6,643,452	$ 898,206	$ -	$ 6,643,452		$ -	$ 898,206			2036	26	$ -	$ 91,352	$ -	$ 200,000	$ -	$ 291,352	$ 3,007,445	$ 7,356,086	$ 994,556	$ -	$ 712,634		$ -	$ 96,349		$ 96,349	$ 7,356,086		$ -	$ 7,356,086	$ 7,356,086	$ -	$ 994,556	$ 994,556
27		$ 96,000	$ 2,626,492	$ -	$ 2,722,492	$ 6,892,170	$ 862,809	$ -	$ 6,892,170		$ -	$ 862,809			2037	27	$ -	$ 90,438	$ -	$ 200,000	$ -	$ 290,438	$ 3,012,930	$ 7,627,434	$ 954,854	$ -	$ 735,264		$ -	$ 92,045		$ 92,045	$ 7,627,434		$ -	$ 7,627,434	$ 7,627,434	$ -	$ 954,854	$ 954,854
28		$ 36,000	$ 2,573,962	$ -	$ 2,609,962	$ 8,410,652	$ 974,910	$ 1,572,103	$ 6,838,549		$ 182,228	$ 792,682			2038	28	$ -	$ 89,534	$ 275,900	$ 200,000	$ -	$ 565,434	$ 3,775,396	$ 9,892,186	$ 1,146,640	$ 722,905	$ 758,628		$ 83,795	$ 87,935		$ 171,730			$ 2,295,009	$ 7,597,177	$ 9,892,186	$ 266,023	$ 880,617	$ 1,146,640
29		$ 36,000	$ 2,522,483	$ -	$ 2,558,483	$ 6,938,293	$ 744,670	$ -	$ 6,938,293		$ -	$ 744,670			2039	29	$ -	$ 88,638	$ -	$ 200,000	$ -	$ 288,638	$ 2,847,121	$ 7,721,045	$ 828,681	$ -	$ 782,752		$ -	$ 84,011		$ 84,011	$ 7,721,045		$ -	$ 7,721,045	$ 7,721,045	$ -	$ 828,681	$ 828,681
30		$ 96,000	$ 2,472,033	$ -	$ 2,568,033	$ 7,207,939	$ 716,306	$ -	$ 7,207,939		$ -	$ 716,306			2040	30	$ -	$ 87,752	$ -	$ 200,000	$ -	$ 287,752	$ 2,855,785	$ 8,015,599	$ 796,569	$ -	$ 807,661		$ -	$ 80,263		$ 80,263	$ 8,015,599		$ -	$ 8,015,599	$ 8,015,599	$ -	$ 796,569	$ 796,569
	$ 19,785,000			$ 3,000,000	$ 116,437,387	$ 190,752,567	$ *71,989,000*	$ 26,610,000	##########		$ 19,994,000	$ 51,996,000				$ 812,900	$ 1,312,542	$ 14,997,500	$ 5,000,000	$ 3,094,614	$ 1,600,000	$ 26,818,000	$ 143,255,000	$ *228,623,000*	$ *91,300,000*	$ 23,256,000	$ 14,615,000		$ 15,211,000	$ 4,100,000	$ 19,311,000			$ 49,866,000	$ 18,757,000	$ *228,623,000*		$ 35,204,000	$ 56,096,000	$ *91,300,000*	

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (after 5 additional wells are installed)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds: sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. 30 years O&M for OU-2 IRM
9. 30 years O&M for RW-400 Plant (O&M costs are equivalent to 2008 OU2 IRM budgeted costs)
10. 2 diffusion wells for RW-400 Plant located at west end of VLSGC
11. Extraction well located at east side of VLSGC
12. Fresh VC offgas treatment media (PPZ) will be required every 5 years in the IRM system and every 10 years in the RW-300/-400 system
13. Capital Costs:
Years 1 and 2 - Install New Groundwater Monitoring, Extraction and Diffusion Wells
Year 2 - Install Piping and Begin Treatment Plant Installation (Design will be performed during year 1)
Year 3 - Complete Treatment Plant Installation

NOTE:
If substituting installation of RW-300 for RW-400, a double-walled PVC pipe well need to be run across the VLSGC.
This pipe would be approximately 3,200 feet. The cost for this pipe would be $560,000 in today's dollars.
O&M costs (e.g., power) may increase slightly due to the increased transport distance of the water.

Table C-15. Cost Estimate for OU-2 Alternative 5a, LMC, Great Neck.

Outpost Monitoring
OU-2 IRM O&M
Install 5 New Extraction Wells at MLWD, VLSGC, and VLS Park and in OU-1 (RW300, RW400BM, RW400MM, RW403, and EW1D)
Install 9 New Diffusion Wells in FMCC parking lot and NSLIJ south (DW401 through DW406 and DW415 through DW417)
Install New 1,500-gpm Treatment Plant in east side of Fresh Meadow Golf Club
Install New 1,700-gpm Treatment Plant in VLSGC
30 Years of O&M of New Treatment Plant
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install New Extraction Wells (5)					
1. RW300, RW400BM, RW400MM, RW403, and EW1D	5	ea	$ 875,000	$ 4,375,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing
2. Well Access Fee	3	ea	$ 50,000	$ 150,000	Basis: Diffusion Well Installation Costs per ARCADIS Principal Sci. rec'd
3. Well Permitting Fee	5	ea	$ 20,000	$ 100,000	
4A. Discharge Piping from RW300 to Treatment Plant	250	ft	$ 175	$ 43,750	Includes double-walled 8" HDPE piping, trenching and restoration.
4B. Discharge Piping from RW400BM and RW400MM to Treatment Plant	1,000	ft	$ 175	$ 175,000	Includes double-walled 8" HDPE piping, trenching and restoration.
4C. Discharge Piping from RW403 to Treatment Plant	3,300	ft	$ 175	$ 577,500	Includes double-walled 8" HDPE piping, trenching and restoration.
Subtotal				**$ 5,422,000**	
Install New Diffusion Wells (9)					
1. Drill and install diffusion wells	9	ea	$ 700,000	$ 6,300,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc.
2. Discharge Piping from Plant	11,200	ft	$ 85	$ 950,383	Single-wall, 8" Blue Brute PVC piping, trenching, and restoration. Est. from pervious ARCADIS FS cost estimates with inflation.
3. Piping Appurtenances	3	ls	$ 30,000	$ 90,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
4. Additional Design & Permitting	3	ea	$ 50,000	$ 150,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07
5. Well Access Fee	3	ea	$ 50,000	$ 150,000	
Subtotal				**$ 7,641,000**	
Install 1,500-gpm Treatment Plant at FMCC for RW400BM and RW400MM					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	1	ea	$ 200,000	$ 200,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	1	ea	$ 100,000	$ 100,000	Foundation (incl. clearwells)
Building	5,200	sf	$ 250	$ 1,300,000	
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	1,250	cy	$ 6.62	$ 8,279	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 390,000	$ 390,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 645,000	$ 645,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in
Horizontal Mist Eliminator and Knock-Out Tank	1	ea	$ 19,000	$ 19,000	
Duct Heater	1	ea	$ 42,000	$ 42,000	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	2	ea	$ 37,500	$ 75,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 130,000	$ 130,000	Bag Filter System.
Ducting	1	ls	$ 225,000	$ 225,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 37,500	$ 75,000	50 Hp pump. Est. from experience.
Blower	1	ea	$ 60,000	$ 60,000	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation)
4. Mechanical Components					
Extraction Well Piping Leak Detection System	1,000	ft	$ 25	$ 25,000	
Process Piping	1	ls	$ 200,000	$ 200,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 130,000	$ 130,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	1	ea	$ 90,000	$ 90,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	1,000	ft	$ 35	$ 35,000	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 2,016,000	$ 2,020,000	
8. Electrical Installation	25%	of	$ 390,000	$ 98,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 6,337,000**	
Install 1,700-gpm Treatment Plant at VLSGC for RW300 and RW403					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	0.25	ea	$ 280,000	$ 70,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	0.5	ea	$ 140,000	$ 70,000	Foundation (incl. clearwells)
Building	5,500	sf	$ 250	$ 1,380,000	
HVAC	1	ea	$ 35,000	$ 35,000	
Soil transport.	625	cy	$ 6.62	$ 4,139	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 91,000	$ 91,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 420,000	$ 420,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 645,000	$ 645,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in
Horizontal Mist Eliminator and Knock-Out Tank	1	ea	$ 22,000	$ 22,000	
Duct Heater	1	ea	$ 45,000	$ 45,000	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	2	ea	$ 37,500	$ 75,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 105,000	$ 105,000	Bag Filter System.
Ducting	1	ls	$ 315,000	$ 315,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 37,500	$ 75,000	50 Hp pump. Est. from experience.
Blower	1	ea	$ 62,500	$ 62,500	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation)
4. Mechanical Components					
Extraction Well Piping Leak Detection System	3,600	ft	$ 25	$ 90,000	
Process Piping	1	ls	$ 210,000	$ 210,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 135,000	$ 135,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	0.5	ea	$ 126,000	$ 63,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	3,600	ft	$ 35	$ 126,000	
Building Controls and Distribution	1	ea	$ 161,000	$ 161,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 161,000	$ 161,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 35,000	$ 35,000	Alarm system.
7. Mechanical Installation	100%	of	$ 2,199,500	$ 2,200,000	
8. Electrical Installation	25%	of	$ 556,000	$ 139,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 18,000	$ 18,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 6,863,000**	
Subtotal of Capital Costs				**$ 28,263,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 28,263,000	$ 1,413,150	
2. Construction Management (7% of capital cost)	7%	of	$ 28,263,000	$ 1,978,410	
3. Project Management (10% of capital cost)	10%	of	$ 28,263,000	$ 2,826,300	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 28,263,000	$ 4,239,450	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 28,263,000	$ 2,437,684	
Subtotal				$ 12,895,000	
TOTAL CAPITAL COST				**$ 41,200,000**	

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 1,500-gpm RW400BM and RW400MM Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.67	ls	$ 210,000	$ 140,700	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 540,000	$ 540,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 300,000	$ 300,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 210,000	$ 210,000	2010 spend for OU-2, increased by 40% for 1,500-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 1,700-gpm RW300 and RW403 Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.67	ls	$ 210,000	$ 140,700	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 612,000	$ 612,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 340,000	$ 340,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 210,000	$ 210,000	2010 spend for OU-2, increased by 40% for 1,700-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 5,110,000**	

Table C-15. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	OU-2 Capital Cost [1]	OU-2 Monitoring Cost	OU-2 O&M Cost	OU-2 Capital Improvements	OU-2 Pre-Escalated Cost	OU-2 Escalated Cost (FV)	OU-2 NPV Cost	OU-2 Capital (FV)	OU-2 O&M (FV)	Total OU-2 FV	OU-2 Capital (NPV)	OU-2 O&M (NPV)	Total OU-2 NPV
1	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 2,961,135	$ 2,741,792	$ 1,506,960	$ 1,454,175	$ 2,961,135	$ 1,395,333	$ 1,346,458	$ 2,741,792
2	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 3,064,775	$ 2,627,550	$ 1,559,704	$ 1,505,071	$ 3,064,775	$ 1,337,194	$ 1,290,356	$ 2,627,550
3	$ 7,223,000	$ 96,000	$ 1,364,000		$ 8,683,000	$ 9,626,997	$ 7,642,221	$ 8,008,269	$ 1,618,728	$ 9,626,997	$ 6,357,222	$ 1,284,999	$ 7,642,221
4	$ 24,881,000	$ 36,000	$ 1,364,000		$ 26,281,000	$ 30,158,052	$ 22,167,069	$ 28,551,520	$ 1,606,532	$ 30,158,052	$ 20,986,219	$ 1,180,849	$ 22,167,069
5	$ 6,141,000	$ 36,000	$ 1,364,000		$ 7,541,000	$ 8,956,342	$ 6,095,536	$ 7,293,582	$ 1,662,761	$ 8,956,342	$ 4,963,889	$ 1,131,647	$ 6,095,536
6		$ 96,000	$ 5,110,000	$ -	$ 5,206,000	$ 6,399,503	$ 4,032,773	$ -	$ 6,399,503	$ 6,399,503	$ -	$ 4,032,773	$ 4,032,773
7		$ 36,000	$ 5,007,800	$ -	$ 5,043,800	$ 6,417,122	$ 3,744,329	$ -	$ 6,417,122	$ 6,417,122	$ -	$ 3,744,329	$ 3,744,329
8		$ 36,000	$ 4,907,644	$ -	$ 4,943,644	$ 6,509,835	$ 3,517,061	$ -	$ 6,509,835	$ 6,509,835	$ -	$ 3,517,061	$ 3,517,061
9		$ 96,000	$ 4,809,491	$ -	$ 4,905,491	$ 6,685,681	$ 3,344,505	$ -	$ 6,685,681	$ 6,685,681	$ -	$ 3,344,505	$ 3,344,505
10		$ 36,000	$ 4,713,301	$ 900,000	$ 5,649,301	$ 7,968,897	$ 3,691,141	$ 1,269,539	$ 6,699,359	$ 7,968,897	$ 588,042	$ 3,103,099	$ 3,691,141
11		$ 36,000	$ 4,619,035	$ -	$ 4,655,035	$ 6,796,211	$ 2,914,778	$ -	$ 6,796,211	$ 6,796,211	$ -	$ 2,914,778	$ 2,914,778
12		$ 96,000	$ 4,526,655	$ -	$ 4,622,655	$ 6,985,148	$ 2,773,899	$ -	$ 6,985,148	$ 6,985,148	$ -	$ 2,773,899	$ 2,773,899
13		$ 36,000	$ 4,436,121	$ -	$ 4,472,121	$ 6,994,201	$ 2,571,753	$ -	$ 6,994,201	$ 6,994,201	$ -	$ 2,571,753	$ 2,571,753
14		$ 36,000	$ 4,347,399	$ -	$ 4,383,399	$ 7,095,384	$ 2,415,702	$ -	$ 7,095,384	$ 7,095,384	$ -	$ 2,415,702	$ 2,415,702
15		$ 96,000	$ 4,260,451	$ 900,000	$ 5,256,451	$ 8,806,389	$ 2,776,141	$ 1,507,814	$ 7,298,575	$ 8,806,389	$ 475,326	$ 2,300,815	$ 2,776,141
16		$ 36,000	$ 4,175,242	$ -	$ 4,211,242	$ 7,302,235	$ 2,131,453	$ -	$ 7,302,235	$ 7,302,235	$ -	$ 2,131,453	$ 2,131,453
17		$ 36,000	$ 4,091,737	$ -	$ 4,127,737	$ 7,407,949	$ 2,002,139	$ -	$ 7,407,949	$ 7,407,949	OU-2	OU-2	$ -	$ 2,002,139	$ 2,002,139	OU-2	OU-2
18		$ 96,000	$ 4,009,902	$ -	$ 4,105,902	$ 7,626,669	$ 1,908,567	$ -	$ 7,626,669	$ 7,626,669	*Capital*	*O&M*	$ -	$ 1,908,567	$ 1,908,567	*Capital*	*O&M*
19		$ 36,000	$ 3,929,704	$ -	$ 3,965,704	$ 7,624,072	$ 1,766,589	$ -	$ 7,624,072	$ 7,624,072	*20 yr FV*	*20 yr FV*	$ -	$ 1,766,589	$ 1,766,589	*20 yr PV*	*20 yr PV*
20		$ 36,000	$ 3,851,110	$ 900,000	$ 4,787,110	$ 9,525,339	$ 2,043,644	$ 1,790,810	$ 7,734,529	$ 9,525,339	***$ 51,488,000***	***$ 113,424,000***	$ 384,215	$ 1,659,429	$ 2,043,644	***$ 36,487,000***	***$ 46,421,000***
21		$ 96,000	$ 3,774,088	$ -	$ 3,870,088	$ 7,970,181	$ 1,583,322	$ -	$ 7,970,181	$ 7,970,181	$ -	$ 1,583,322	$ 1,583,322
22		$ 36,000	$ 3,698,606	$ -	$ 3,734,606	$ 7,960,357	$ 1,464,232	$ -	$ 7,960,357	$ 7,960,357	$ -	$ 1,464,232	$ 1,464,232
23		$ 36,000	$ 3,624,634	$ -	$ 3,660,634	$ 8,075,778	$ 1,375,428	$ -	$ 8,075,778	$ 8,075,778	$ -	$ 1,375,428	$ 1,375,428
24		$ 96,000	$ 3,552,142	$ -	$ 3,648,142	$ 8,329,906	$ 1,313,621	$ -	$ 8,329,906	$ 8,329,906	$ -	$ 1,313,621	$ 1,313,621
25		$ 36,000	$ 3,481,099	$ 900,000	$ 4,417,099	$ 10,438,686	$ 1,524,235	$ 2,126,920	$ 8,311,766	$ 10,438,686	$ 310,568	$ 1,213,667	$ 1,524,235
26		$ 36,000	$ 3,411,477	$ -	$ 3,447,477	$ 8,432,385	$ 1,140,073	$ -	$ 8,432,385	$ 8,432,385	$ -	$ 1,140,073	$ 1,140,073
27		$ 96,000	$ 3,343,247	$ -	$ 3,439,247	$ 8,706,685	$ 1,089,962	$ -	$ 8,706,685	$ 8,706,685	$ -	$ 1,089,962	$ 1,089,962
28		$ 36,000	$ 3,276,382	$ -	$ 3,312,382	$ 8,679,011	$ 1,006,016	$ -	$ 8,679,011	$ 8,679,011	$ -	$ 1,006,016	$ 1,006,016
29		$ 36,000	$ 3,210,855	$ -	$ 3,246,855	$ 8,805,074	$ 945,027	$ -	$ 8,805,074	$ 8,805,074	$ -	$ 945,027	$ 945,027
30		$ 96,000	$ 3,146,638	$ -	$ 3,242,638	$ 9,101,415	$ 904,474	$ -	$ 9,101,415	$ 9,101,415	$ -	$ 904,474	$ 904,474
	$ 41,157,000			$ 3,600,000	$ 154,581,762	$ 251,411,415	**$ 95,256,000**	$ 53,615,117	$ 197,796,298	$ 251,411,000	$ 36,798,010	$ 58,457,023	$ 95,255,000

Year	N12796 & N4388 Capital Cost	N12796 & N4388 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M
1					$ 1,515,500	
2					$ 1,515,500	
3					$ -	$ 160,000
4			$ 939,500		$ -	$ 160,000
5			$ 939,500		$ 31,807	$ 160,000
6				$ 71,000	$ -	$ 160,000
7					$ -	$ 160,000
8					$ -	$ 160,000
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23	$ 739,000					
24	$ -	$ 100,000				
25	$ -	$ 98,000				
26	$ -	$ 96,040				
27	$ 36,950	$ 94,119				
28	$ -	$ 92,237				
29	$ -	$ 90,392				
30	$ -	$ 88,584				
	$ 775,950	$ 659,372	$ 1,879,000	$ 71,000	$ 3,062,807	$ 960,000

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 45 wells (following installation of additional wells)
2. Every 3 years, annual sampling is required for 135 wells (includes public supply wells)
3. First two sampling rounds: sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. 30 years O&M for OU2 IRM
9. 30 years O&M for RW-400/-502 Plant
10. 4 diffusion wells for RW-400/RW-502 Plant located at the west end of VLSGC
11. O&M Costs for RW-400/-502 Plant, Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on ratio of new higher hp to old hp
* Assume Media Costs are increased by 100% (since flow rate will roughly triple and
new flow will conservatively have the same removal rate)
* Increase labor costs by 15%
12. VC offgas treatment media (PZ) will be required every 5 years in the IRM system
and every 7.5 years in the RW-400/-502 system
13. Capital Costs
Years 1 and 2 - Install Groundwater Monitoring Wells, Extraction Wells, Diffusion Wells, and Piping
Years 2 - Install Treatment Plant at RW-400 (1/2)
Year 3 - Install Treatment Plant at RW-400 (1/2)

Welhead Pre-Escalated Cost	Wellhead Pre-Escalated Cost	Wellhead Escalated Cost (FV)	Wellhead NPV Cost	**Wellhead Capital FV**	**Wellhead O&M FV**	**Wellhead Capital (NPV)**	**Wellhead O&M (NPV)**	**Total Capital FV**	**Total O&M FV**	**Total FV**	**Total Capital NPV**	**Total O&M NPV**	**Total NPV**
$ 1,515,500	$ 4,376,500	$ 4,529,678	$ 4,194,146	$ 1,568,543	$ -	$ 1,452,354	$ -	$ 3,075,503	$ 1,454,175	$ 4,529,678	$ 2,847,688	$ 1,346,458	$ 4,194,146
$ 1,515,500	$ 4,376,500	$ 4,688,216	$ 4,019,390	$ 1,623,441	$ -	$ 1,391,839	$ -	$ 3,183,145	$ 1,505,071	$ 4,688,216	$ 2,729,034	$ 1,290,356	$ 4,019,390
$ 160,000	$ 8,843,000	$ 9,804,392	$ 7,783,043	$ -	$ 177,395	$ -	$ 140,822	$ 8,008,269	$ 1,796,123	$ 9,804,392	$ 6,357,222	$ 1,425,820	$ 7,783,043
$ 1,099,500	$ 27,380,500	$ 31,419,754	$ 23,094,457	$ 1,078,098	$ 183,604	$ 792,434	$ 134,954	$ 29,629,618	$ 1,790,136	$ 31,419,754	$ 21,778,653	$ 1,315,803	$ 23,094,457
$ 1,131,307	$ 8,672,307	$ 10,299,980	$ 7,009,993	$ 1,153,608	$ 190,030	$ 785,126	$ 129,331	$ 8,447,189	$ 1,852,791	$ 10,299,980	$ 5,749,015	$ 1,260,978	$ 7,009,993
$ 231,000	$ 5,437,000	$ 6,683,461	$ 4,211,714	$ -	$ 283,958	$ -	$ 178,942	$ -	$ 6,683,461	$ 6,683,461	$ -	$ 4,211,714	$ 4,211,714
$ 160,000	$ 5,203,800	$ 6,620,687	$ 3,863,107	$ -	$ 203,565	$ -	$ 118,778	$ -	$ 6,620,687	$ 6,620,687	$ -	$ 3,863,107	$ 3,863,107
$ 160,000	$ 5,103,644	$ 6,720,525	$ 3,630,890	$ -	$ 210,689	$ -	$ 113,829	$ -	$ 6,720,525	$ 6,720,525	$ -	$ 3,630,890	$ 3,630,890
$ -	$ 4,905,491	$ 6,685,681	$ 3,344,505	$ -	$ -	$ -	$ -	$ -	$ 6,685,681	$ 6,685,681	$ -	$ 3,344,505	$ 3,344,505
$ -	$ 5,649,301	$ 7,968,897	$ 3,691,141	$ -	$ -	$ -	$ -	$ 1,269,539	$ 6,699,359	$ 7,968,897	$ 588,042	$ 3,103,099	$ 3,691,141
$ -	$ 4,655,035	$ 6,796,211	$ 2,914,778	$ -	$ -	$ -	$ -	$ -	$ 6,796,211	$ 6,796,211	$ -	$ 2,914,778	$ 2,914,778
$ -	$ 4,622,655	$ 6,985,148	$ 2,773,899	$ -	$ -	$ -	$ -	$ -	$ 6,985,148	$ 6,985,148	$ -	$ 2,773,899	$ 2,773,899
$ -	$ 4,472,121	$ 6,994,201	$ 2,571,753	$ -	$ -	$ -	$ -	$ -	$ 6,994,201	$ 6,994,201	$ -	$ 2,571,753	$ 2,571,753
$ -	$ 4,383,399	$ 7,095,384	$ 2,415,702	$ -	$ -	$ -	$ -	$ -	$ 7,095,384	$ 7,095,384	$ -	$ 2,415,702	$ 2,415,702
$ -	$ 5,256,451	$ 8,806,389	$ 2,776,141	$ -	$ -	$ -	$ -	$ 1,507,814	$ 7,298,575	$ 8,806,389	$ 475,326	$ 2,300,815	$ 2,776,141
$ -	$ 4,211,242	$ 7,302,235	$ 2,131,453	$ -	$ -	$ -	$ -	$ -	$ 7,302,235	$ 7,302,235	$ -	$ 2,131,453	$ 2,131,453
$ -	$ 4,127,737	$ 7,407,949	$ 2,002,139	$ -	$ -	$ -	$ -	$ -	$ 7,407,949	$ 7,407,949	$ -	$ 2,002,139	$ 2,002,139
$ -	$ 4,105,902	$ 7,626,669	$ 1,908,567	$ -	$ -	$ -	$ -	$ -	$ 7,626,669	$ 7,626,669	$ -	$ 1,908,567	$ 1,908,567
$ -	$ 3,965,704	$ 7,624,072	$ 1,766,589	$ -	$ -	$ -	$ -	$ -	$ 7,624,072	$ 7,624,072	$ -	$ 1,766,589	$ 1,766,589
$ -	$ 4,787,110	$ 9,525,339	$ 2,043,644	$ -	$ -	$ -	$ -	$ 1,790,810	$ 7,734,529	$ 9,525,339	$ 384,215	$ 1,659,429	$ 2,043,644
$ -	$ 3,870,088	$ 7,970,181	$ 1,583,322	$ -	$ -	$ -	$ -	$ -	$ 7,970,181	$ 7,970,181	$ -	$ 1,583,322	$ 1,583,322
$ -	$ 3,734,606	$ 7,960,357	$ 1,464,232	$ -	$ -	$ -	$ -	$ -	$ 7,960,357	$ 7,960,357	$ -	$ 1,464,232	$ 1,464,232
$ 739,000	$ 4,399,634	$ 9,706,097	$ 1,653,097	$ 1,630,319	$ -	$ 277,668	$ -	$ 1,630,319	$ 8,075,778	$ 9,706,097	$ 277,668	$ 1,375,428	$ 1,653,097
$ 100,000	$ 3,748,142	$ 8,558,238	$ 1,349,629	$ -	$ 228,333	$ -	$ 36,008	$ -	$ 8,558,238	$ 8,558,238	$ -	$ 1,349,629	$ 1,349,629
$ 98,000	$ 4,515,099	$ 10,670,284	$ 1,558,053	$ -	$ 231,598	$ -	$ 33,817	$ 2,126,920	$ 8,543,364	$ 10,670,284	$ 310,568	$ 1,247,484	$ 1,558,053
$ 96,040	$ 3,543,517	$ 8,667,295	$ 1,171,834	$ -	$ 234,910	$ -	$ 31,760	$ -	$ 8,667,295	$ 8,667,295	$ -	$ 1,171,834	$ 1,171,834
$ 131,069	$ 3,570,316	$ 9,038,496	$ 1,131,501	$ 93,541	$ 238,269	$ 11,710	$ 29,828	$ 93,541	$ 8,944,954	$ 9,038,496	$ 11,710	$ 1,119,790	$ 1,131,501
$ 92,237	$ 3,404,619	$ 8,920,687	$ 1,034,030	$ -	$ 241,676	$ -	$ 28,014	$ -	$ 8,920,687	$ 8,920,687	$ -	$ 1,034,030	$ 1,034,030
$ 90,392	$ 3,337,247	$ 9,050,206	$ 971,336	$ -	$ 245,132	$ -	$ 26,309	$ -	$ 9,050,206	$ 9,050,206	$ -	$ 971,336	$ 971,336
$ 88,584	$ 3,331,222	$ 9,350,052	$ 929,183	$ -	$ 248,638	$ -	$ 24,709	$ -	$ 9,350,052	$ 9,350,052	$ -	$ 929,183	$ 929,183
$ 7,409,000	$ 161,990,000	$ 261,477,000	**$ 101,000,000**	$ 7,200,000	$ 3,000,000	$ 4,711,132	$ 1,027,101	$ 60,763,000	$ 200,714,000	**$ 261,477,000**	$ 41,500,000	$ 59,500,000	**$ 101,000,000**

Wellhead Capital 20 yr FV	Wellhead O&M 20 yr FV	Wellhead Capital 20 yr FV	Wellhead O&M 20 yr FV	Total Capital 20 yr FV	Total O&M 20 yr FV	Total Capital 20 yr NPV	Total O&M 20 yr NPV
$ 5,424,000	*$ 1,249,000*	*$ 4,422,000*	*$ 817,000*	*$ 56,912,000*	*$ 114,673,000*	*$ 40,909,000*	*$ 47,238,000*

Table C-16. Cost Estimate for OU-2 Scenario 5b LMC, Great Neck.

Outpost Monitoring
OU-2 IRM P&T
Install 5 New Extraction Wells (RW501 through RW504 and EW1D)
Install 9 New Diffusion Wells (DW501 through DW509)
Install a New 1,300-gpm Treatment Plant and a New 2,000-gpm Treatment Plant
Install 4 New Groundwater Monitoring Wells into Basal Magothy

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Install 4 Groundwater Monitoring Well Clusters (250-350 ft)				**$ 2,000,000**	
Install 5 New Extraction Wells					
1. Extraction Well Installation	5	ea	$ 875,000	$ 4,375,000	Typ. diffusion well cost x 25% Includes: 60 Hp pump, leads, and installation Piping work in vault: main, cla-valve, gate valve, fittings, flow meter. Below-grade Concrete Vault Hatches, Coatings, Heater Site Preparation, Site Restoration and Waste Removal Well Development and Testing Design
2. Well Access Fee	4	ea	$ 50,000	$ 200,000	Well access fee not required for EW-1D
3. Well Permitting Fee	5	ea	$ 20,000	$ 100,000	
4. Discharge Piping from RWs to Treatment System	10,500	ft	$ 175	$ 1,837,500	Includes double-walled 8" HDPE piping, trenching and restoration.
Subtotal				**$ 6,513,000**	
Install 9 New Diffusion Wells (DW501 through DW509)					
1. Drill and install diffusion wells	9	ea	$ 650,000	$ 5,850,000	Basis: ARCADIS Cost Proposal to Lockheed dated 6/28/07; Delta Well & Pump Co., Inc. Bid to ARCADIS (11/07)
2. Piping Appurtenances	9	ea	$ 30,000	$ 270,000	Valves, piping between diffusion wells. Basis: prev. ARCADIS FS cost estimates.
3. Discharge Piping from Treatment Plant to Diffusion Wells	18,000	ft	$ 85	$ 1,530,000	Includes trenching and piping for new pipeline; assumes individual 8-inch diameter lines for each pair of diffusion wells
4. Additional Design & Permitting	9	ea	$ 50,000	$ 450,000	
5. Well Access Fee	9	ea	$ 50,000	$ 450,000	
Subtotal				**$ 8,550,000**	
Install New 2,000-gpm Treatment Plant					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	1	ea	$ 200,000	$ 200,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	1	ea	$ 100,000	$ 100,000	Foundation (incl. clearwells)
Building	6,000	sf	$ 250	$ 1,500,000	
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	1,250	cy	$ 6.62	$ 8,279	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 451,000	$ 451,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 745,000	$ 745,000	config. As IRM); 56,000 lb PPZ x $1.10lb; 60,000 lb VPGAC x $1.20/lb est. from experience
Horizontal Mist Eliminator and Knock-Out Tank	1	ea	$ 22,000	$ 22,000	
Duct Heater	1	ea	$ 48,500	$ 48,500	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	2	ea	$ 43,400	$ 86,800	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 151,000	$ 151,000	Bag Filter System.
Ducting	1	ls	$ 330,000	$ 330,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 43,400	$ 86,800	50 Hp pump. Est. from experience.
Blower	1	ea	$ 69,300	$ 69,300	plus installation.
4. Mechanical Components					
Extraction Well Piping Leak Detection System	5,250	ft	$ 25	$ 131,250	
Process Piping	1	ls	$ 231,000	$ 231,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 130,000	$ 130,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	1	ea	$ 90,000	$ 90,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	5,250	ft	$ 35	$ 183,750	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 2,482,650	$ 2,480,000	
8. Electrical Installation	25%	of	$ 538,750	$ 135,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 7,450,000**	
Install New 1,300-gpm Treatment Plant					*Note: Basis of Below Costs, except as noted*
1. General Site Preparation	1	ea	$ 200,000	$ 200,000	Clearing, grading, mobilization and foundation preparation
2. Treatment Building					
Concrete Work	1	ea	$ 100,000	$ 100,000	Foundation (incl. clearwells)
Building	4,800	sf	$ 250	$ 1,200,000	
HVAC	1	ea	$ 25,000	$ 25,000	
Soil transport.	1,250	cy	$ 6.62	$ 8,279	On-site haul. Spread in basins.
Final Grading, Fencing, and Landscape	1	ls	$ 65,000	$ 65,000	
3. Major Process Equipment Items					
Air Stripping Tower	1	ea	$ 364,000	$ 364,000	
Off-gas Treatment Vessels, filled with media	1	ls	$ 601,000	$ 601,000	Estimate from Tigg Corp. to ARCADIS dated 8/3/07 ($500k capital cost for 5 vessels in same config. As IRM); 56,000 lb PPZ x $1.10lb; 60,000 lb VPGAC x $1.20/lb est. from experience
Horizontal Mist Eliminator and Knock-Out Tank	1	ea	$ 15,400	$ 15,400	
Duct Heater	1	ea	$ 39,100	$ 39,100	Assumes 50 hp unit. Est. from experience.
Clearwell Pumps	2	ea	$ 35,000	$ 70,000	Assumes two 50 hp variable speed drive pumps. Est. from experience.
Filtration System	1	ls	$ 122,000	$ 122,000	Bag Filter System.
Ducting	1	ls	$ 210,000	$ 210,000	Duct and insulation/controls installed. Est. from experience with IRM installation.
Discharge Pump	2	ea	$ 35,000	$ 70,000	50 Hp pump. Est. from experience.
Blower	1	ea	$ 55,900	$ 55,900	100 hp blower. Per quote from Northern Blower to ARCADIS dated 12/9/05 (plus inflation) plus installation.
4. Mechanical Components					
Extraction Well Piping Leak Detection System	5,250	ft	$ 25	$ 131,250	
Process Piping	1	ls	$ 200,000	$ 200,000	Includes labor and piping (building interior)/process equipment installation
Piping Appurtanances	1	ls	$ 130,000	$ 130,000	Includes valves, gauges, controls, sensors, flowmeters, diffusion line flush.
5. Electrical Components					
Electrical Service Conduits, Transformer	1	ea	$ 90,000	$ 90,000	800 amp service
Power to Treatment Structure	100	ft	$ 100	$ 10,000	From source to treatment building
Conduit/Conductors to Well Vaults	5,250	ft	$ 35	$ 183,750	
Building Controls and Distribution	1	ea	$ 115,000	$ 115,000	Includes MCC, disconnect, lights, power to HVAC
Process Controls	1	ea	$ 115,000	$ 115,000	Includes PLC and interlocks, alarms, etc.
6. Building Security System	1	ls	$ 25,000	$ 25,000	Alarm system.
7. Mechanical Installation	100%	of	$ 2,008,650	$ 2,010,000	
8. Electrical Installation	25%	of	$ 538,750	$ 135,000	
9. Treatment System Operational Testing and Startup	1	ls	$ 15,000	$ 15,000	Includes laboratory sample analysis.
10. Treatment System Access Fee	1	ea	$ 100,000	$ 100,000	
Subtotal				**$ 6,406,000**	
Subtotal of Capital Costs				**$ 30,919,000**	
Engineering/Project Management					
1. Engineering (5% of capital cost)	5%	of	$ 30,919,000	$ 1,545,950	
2. Construction Management (7% of capital cost)	7%	of	$ 30,919,000	$ 2,164,330	
3. Project Management (10% of capital cost)	10%	of	$ 30,919,000	$ 3,091,900	
4. Construction Contingency (Union Labor; 15% of capital cost)	15%	of	$ 30,919,000	$ 4,637,850	
5. New York State Sales Tax (8.625% of capital cost)	8.625%	of	$ 30,919,000	$ 2,666,764	

Description	Quantity	Units	Unit Cost ($)	Total Cost ($)	Descriptions
Subtotal				**$ 14,107,000**	
TOTAL CAPITAL COST				**$ 45,000,000**	
Treatment Plant/Equipment Annual O&M (OU-2 IRM P&T System Cost)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.33	ls	$ 210,000	$ 69,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 180,000	$ 180,000	From RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 100,000	$ 100,000	2010 spend
Zeolite/Pot Perm Media Cost (VC removal)	1	ls	$ 26,250	$ 26,250	Annualized based on change-out every 4 years
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 120,000	$ 120,000	2010 spend, reduced by 20% for treatment system duplication efficiency
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 1,300-gpm Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.33	ls	$ 190,000	$ 62,700	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	0.67	ls	$ 210,000	$ 140,700	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 468,000	$ 468,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 260,000	$ 260,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 262,500	$ 262,500	2010 spend for OU-2, increased by 75% for 2,000-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
(New 2,000-gpm Treatment System)					
GWTS Operations, Checklist and Inspections	1	ls	$ 256,000	$ 256,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Monthly Compliance Sampling/Analysis and Alarm Testing	1	ls	$ 56,000	$ 56,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Quarterly O&M Activities - Preventative Maintenance	1	ls	$ 80,000	$ 80,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Extraction Well Cleaning and Redevelopment	0.67	ls	$ 190,000	$ 127,300	2010 budget estimate to clean one well (performed every 3 years)
Diffusion Well Cleaning and Redevelopment	1.33	ls	$ 210,000	$ 279,300	2010 budget estimate to clean one well with carbon dioxide (performed every 3 years)
Monthly Utility Expenses, including electric	1	ls	$ 720,000	$ 720,000	Flow rate adjusted from RAA-2a costing
Monthly Service Contractors (e.g., electrical, controls)	1	ls	$ 120,000	$ 120,000	2010 spend plus 20%
Vapor Phase Carbon Replacement	1	ls	$ 400,000	$ 400,000	Flow rate adjusted from RAA-2a costing
Zeolite/Pot Perm Media Cost (VC removal)	0	ls	$ 26,250	$ -	
Quarterly Progress Reports to NYSDEC	1	ls	$ 28,000	$ 28,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Unscheduled O&M and System Repair	1	ls	$ 262,500	$ 262,500	2010 spend for OU-2, increased by 75% for 2,000-gpm system vs. 500-gpm system
OM&M Plan Revisions and As-Builts	1	ls	$ 32,000	$ 32,000	2010 spend, reduced by 20% for treatment system duplication efficiency
Annual GWTS Performance Analysis	1	ls	$ 28,800	$ 28,800	2010 spend, reduced by 20% for treatment system duplication efficiency
Project Management	1	ls	$ 44,000	$ 44,000	2010 spend, reduced by 20% for treatment system duplication efficiency
TOTAL ANNUAL O&M COST				**$ 5,480,000**	

Table C-16. NPV Operation & Maintenance Costs Escalated over a 30-Year Period
Discount Rate: 8%
Escalation Rate: 3.5%

Year	Capital Cost [1]	Monitoring Cost	OU-2 O&M Cost	OU-2 Capital Improvements	OU-2 Pre-Escalated Cost	OU-2 Escalated Cost (FV)	OU-2 NPV Cost	OU-2 Capital FV	OU-2 O&M FV			OU-2 Capital PV	OU-2 O&M PV			Year	N12796 & N4388 Capital Cost	N12796 & N5099 O&M	N5099 Capital Cost	N5099 O&M	N13000b Capital Cost	N13000b O&M
1	$ 1,456,000	$ 41,000	$ 1,364,000		$ 2,861,000	$ 2,961,135	$ 2,741,792	$ 1,506,960	$ 1,454,175			$ 1,395,333	$ 1,346,458			2011	1					$ 1,515,500	
2	$ 8,768,000	$ 41,000	$ 1,364,000		$ 10,173,000	$ 10,897,572	$ 9,342,911	$ 9,392,501	$ 1,505,071			$ 8,052,556	$ 1,290,356			2012	2					$ 1,515,500	
3	$ 10,928,000	$ 96,000	$ 1,364,000		$ 12,388,000	$ 13,734,797	$ 10,903,125	$ 12,116,069	$ 1,618,728			$ 9,618,126	$ 1,284,999			2013	3					$ -	$ 160,000
4	$ 10,929,000	$ 36,000	$ 1,364,000		$ 12,329,000	$ 14,147,811	$ 10,399,063	$ 12,541,279	$ 1,606,532			$ 9,218,214	$ 1,180,849			2014	4					$ -	$ 160,000
5	$ 3,617,000	$ 36,000	$ 1,364,000		$ 5,017,000	$ 5,958,622	$ 4,055,338	$ 4,295,861	$ 1,662,761			$ 2,923,691	$ 1,131,647			2015	5					$ 31,807	$ 160,000
6		$ 96,000	$ 5,480,000	$ -	$ 5,576,000	$ 6,854,328	$ 4,319,389	$ -	$ 6,854,328			$ -	$ 4,319,389			2016	6					$ -	$ 160,000
7		$ 36,000	$ 5,370,400	$ -	$ 5,406,400	$ 6,878,451	$ 4,013,510	$ -	$ 6,878,451			$ -	$ 4,013,510			2017	7					$ -	$ 160,000
8		$ 36,000	$ 5,262,992	$ -	$ 5,298,992	$ 6,977,761	$ 3,769,867	$ -	$ 6,977,761			$ -	$ 3,769,867			2018	8					$ -	$ 160,000
9		$ 96,000	$ 5,157,732	$ -	$ 5,253,732	$ 7,160,298	$ 3,581,932	$ -	$ 7,160,298			$ -	$ 3,581,932			2019	9					$ -	$ 160,000
10		$ 36,000	$ 5,054,578	$ 900,000	$ 5,990,578	$ 8,450,301	$ 3,914,124	$ 1,269,539	$ 7,180,762			$ -	$ 3,326,082			2020	10						
11		$ 36,000	$ 4,953,486	$ -	$ 4,989,486	$ 7,284,498	$ 3,124,197	$ -	$ 7,284,498			$ -	$ 3,124,197			2021	11						
12		$ 96,000	$ 4,854,416	$ -	$ 4,950,416	$ 7,480,419	$ 2,970,577	$ -	$ 7,480,419			$ -	$ 2,970,577			2022	12						
13		$ 36,000	$ 4,757,328	$ -	$ 4,793,328	$ 7,496,554	$ 2,756,467	$ -	$ 7,496,554			$ -	$ 2,756,467			2023	13						
14		$ 36,000	$ 4,662,181	$ -	$ 4,698,181	$ 7,604,920	$ 2,589,179	$ -	$ 7,604,920			$ -	$ 2,589,179			2024	14						
15		$ 96,000	$ 4,568,938	$ 900,000	$ 5,564,938	$ 9,323,212	$ 2,939,065	$ 1,507,814	$ 7,815,398			$ -	$ 2,463,739			2025	15						
16		$ 36,000	$ 4,477,559	$ -	$ 4,513,559	$ 7,826,448	$ 2,284,466	$ -	$ 7,826,448			$ -	$ 2,284,466			2026	16						
17		$ 36,000	$ 4,388,008	$ -	$ 4,424,008	$ 7,939,659	$ 2,145,843	$ -	$ 7,939,659			$ -	$ 2,145,843			2027	17						
18		$ 96,000	$ 4,300,248	$ -	$ 4,396,248	$ 8,165,983	$ 2,043,529	$ -	$ 8,165,983	***Capital***	***O&M***	$ -	$ 2,043,529	***Capital***	***O&M***	2028	18						
19		$ 36,000	$ 4,214,243	$ -	$ 4,250,243	$ 8,171,097	$ 1,893,342	$ -	$ 8,171,097	***20 yr FV***	***20 yr FV***	$ -	$ 1,893,342	***20 yr NPV***	***20 yr NPV***	2029	19						
20		$ 36,000	$ 4,129,958	$ 900,000	$ 5,065,958	$ 10,080,186	$ 2,162,686	$ 1,790,810	$ 8,289,377	***$ 44,421,000***	***$ 120,973,000***	$ -	$ 1,778,471	***$ 31,208,000***	***$ 49,295,000***	2030	20						
21		$ 96,000	$ 4,047,359	$ -	$ 4,143,359	$ 8,532,963	$ 1,695,122	$ -	$ 8,532,963			$ -	$ 1,695,122			2031	21						
22		$ 36,000	$ 3,966,412	$ -	$ 4,002,412	$ 8,531,186	$ 1,569,231	$ -	$ 8,531,186			$ -	$ 1,569,231			2032	22						
23		$ 36,000	$ 3,887,083	$ -	$ 3,923,083	$ 8,654,771	$ 1,474,040	$ -	$ 8,654,771			$ -	$ 1,474,040			2033	23						
24		$ 96,000	$ 3,809,342	$ -	$ 3,905,342	$ 8,917,178	$ 1,406,233	$ -	$ 8,917,178			$ -	$ 1,406,233			2034	24						
25		$ 36,000	$ 3,733,155	$ 900,000	$ 4,669,155	$ 11,034,357	$ 1,611,214	$ 2,126,920	$ 8,907,436			$ -	$ 1,300,645			2035	25						
26		$ 36,000	$ 3,658,492	$ -	$ 3,694,492	$ 9,036,574	$ 1,221,761	$ -	$ 9,036,574			$ -	$ 1,221,761			2036	26						
27		$ 96,000	$ 3,585,322	$ -	$ 3,681,322	$ 9,319,513	$ 1,166,680	$ -	$ 9,319,513			$ -	$ 1,166,680			2037	27						
28		$ 36,000	$ 3,513,615	$ -	$ 3,549,615	$ 9,300,603	$ 1,078,067	$ -	$ 9,300,603			$ -	$ 1,078,067			2038	28						
29		$ 36,000	$ 3,443,343	$ -	$ 3,479,343	$ 9,435,554	$ 1,012,695	$ -	$ 9,435,554			$ -	$ 1,012,695			2039	29						
30		$ 96,000	$ 3,374,476	$ -	$ 3,470,476	$ 9,740,911	$ 968,026	$ -	$ 9,740,911			$ -	$ 968,026			2040	30						
	$ 35,698,000				$ 156,458,664	$ 257,897,661	**$ 95,154,000**	$ 46,547,753	$ 211,350,000			$ 31,207,920	$ 62,187,399					$ -	$ -	$ -	$ -	$ -	

[1] New RW/DW/Plant Installation per below schedule; Purveyor DWs per below schedule (includes pump upgrades)

Major Assumptions in the Cost Estimate

1. Annual sampling is required for 40 wells
2. Every 3 years, annual sampling is required for 130 wells (includes public supply wells)
3. During first two sampling rounds, sampling will be conducting using low flow pumps (not dedicated)
4. Following first two sampling rounds, sampling will be conducted using PDBs
5. Pump sampling: 4 wells per day
6. PDB sampling: ~5 wells/day
7. Laboratory analysis for VOCs by EPA 8260B (chlorinated VOCs)
8. 30 years O&M for OU2 IRM
9. 30 years O&M for New Plant
10. O&M Costs for 4,000-gpm plant, Use 2008 IRM Costs and Update as Follows:
* Scale Electrical Costs based on ratio of new higher hp to old hp
* Assume VPGAC Media Costs are increased by 5 times based on flow rate increase and lower concentrations
* Increase labor costs by 100-125%
11. New groundwater monitoring wells will be installed in year 1
12. New extraction and diffusion wells will be installed in years 1, 2, and 3 (1 module per year for 2 years, 2 modules in year 3)
13. New treatment plant will be installed in years 2, and 3 (online in year 4)
14. VC offgas treatment media (PPZ) will be required every 5 years.

Welhead Pre-Escalated Cost	Total Pre-Escalated Cost	Total Escalated Cost (FV)	Total PV (Cost)	**Wellhead Capital FV**	**Wellhead O&M FV**	**Wellhead Capital NPV**	**Wellhead O&M NPV**	**Total Capital FV**	**Total O&M FV**	**Total FV**	**Total Capital NPV**	**Total O&M NPV**	**Total FV**
$ 1,515,500	$ 4,376,500	$ 4,529,678	$ 4,194,146	$ 1,568,543	$ -	$ 1,452,354	$ -	$ 3,075,503	$ 1,454,175	$ 4,529,678	$ 2,847,688	$ 1,346,458	$ 4,194,146
$ 1,515,500	$ 11,688,500	$ 12,521,013	$ 10,734,751	$ 1,623,441	$ -	$ 1,391,839	$ -	$ 11,015,942	$ 1,505,071	$ 12,521,013	$ 9,444,395	$ 1,290,356	$ 10,734,751
$ 160,000	$ 12,548,000	$ 13,912,192	$ 11,043,946	$ -	$ 177,395	$ -	$ 140,822	$ 12,116,069	$ 1,796,123	$ 13,912,192	$ 9,618,126	$ 1,425,820	$ 11,043,946
$ 160,000	$ 12,489,000	$ 14,331,415	$ 10,534,018	$ -	$ 183,604	$ -	$ 134,954	$ 12,541,279	$ 1,790,136	$ 14,331,415	$ 9,218,214	$ 1,315,803	$ 10,534,018
$ 191,807	$ 5,208,807	$ 6,186,429	$ 4,210,379	$ 37,777	$ 190,030	$ 25,710	$ 129,331	$ 4,333,638	$ 1,852,791	$ 6,186,429	$ 2,949,401	$ 1,260,978	$ 4,210,379
$ 160,000	$ 5,736,000	$ 7,051,009	$ 4,443,331	$ -	$ 196,681	$ -	$ 123,942	$ -	$ 7,051,009	$ 7,051,009	$ -	$ 4,443,331	$ 4,443,331
$ 160,000	$ 5,566,400	$ 7,082,015	$ 4,132,288	$ -	$ 203,565	$ -	$ 118,778	$ -	$ 7,082,015	$ 7,082,015	$ -	$ 4,132,288	$ 4,132,288
$ 160,000	$ 5,458,992	$ 7,188,450	$ 3,883,696	$ -	$ 210,689	$ -	$ 113,829	$ -	$ 7,188,450	$ 7,188,450	$ -	$ 3,883,696	$ 3,883,696
$ 160,000	$ 5,413,732	$ 7,378,361	$ 3,691,018	$ -	$ 218,064	$ -	$ 109,086	$ -	$ 7,378,361	$ 7,378,361	$ -	$ 3,691,018	$ 3,691,018
$ -	$ 5,990,578	$ 8,450,301	$ 3,914,124	$ -	$ -	$ -	$ -	$ 1,269,539	$ 7,180,762	$ 8,450,301	$ -	$ 3,326,082	$ 3,326,082
$ -	$ 4,989,486	$ 7,284,498	$ 3,124,197	$ -	$ -	$ -	$ -	$ -	$ 7,284,498	$ 7,284,498	$ -	$ 3,124,197	$ 3,124,197
$ -	$ 4,950,416	$ 7,480,419	$ 2,970,577	$ -	$ -	$ -	$ -	$ -	$ 7,480,419	$ 7,480,419	$ -	$ 2,970,577	$ 2,970,577
$ -	$ 4,793,328	$ 7,496,554	$ 2,756,467	$ -	$ -	$ -	$ -	$ -	$ 7,496,554	$ 7,496,554	$ -	$ 2,756,467	$ 2,756,467
$ -	$ 4,698,181	$ 7,604,920	$ 2,589,179	$ -	$ -	$ -	$ -	$ -	$ 7,604,920	$ 7,604,920	$ -	$ 2,589,179	$ 2,589,179
$ -	$ 5,564,938	$ 9,323,212	$ 2,939,065	$ -	$ -	$ -	$ -	$ 1,507,814	$ 7,815,398	$ 9,323,212	$ -	$ 2,463,739	$ 2,463,739
$ -	$ 4,513,559	$ 7,826,448	$ 2,284,466	$ -	$ -	$ -	$ -	$ -	$ 7,826,448	$ 7,826,448	$ -	$ 2,284,466	$ 2,284,466
$ -	$ 4,424,008	$ 7,939,659	$ 2,145,843	$ -	$ -	$ -	$ -	$ -	$ 7,939,659	$ 7,939,659	$ -	$ 2,145,843	$ 2,145,843
$ -	$ 4,396,248	$ 8,165,983	$ 2,043,529	$ -	$ -	$ -	$ -	$ -	$ 8,165,983	$ 8,165,983	$ -	$ 2,043,529	$ 2,043,529
$ -	$ 4,250,243	$ 8,171,097	$ 1,893,342	$ -	$ -	$ -	$ -	$ -	$ 8,171,097	$ 8,171,097	$ -	$ 1,893,342	$ 1,893,342
$ -	$ 5,065,958	$ 10,080,186	$ 2,162,686	$ -	$ -	$ -	$ -	$ 1,790,810	$ 8,289,377	$ 10,080,186	$ -	$ 1,778,471	$ 1,778,471
$ -	$ 4,143,359	$ 8,532,963	$ 1,695,122	$ -	$ -	$ -	$ -	$ -	$ 8,532,963	$ 8,532,963	$ -	$ 1,695,122	$ 1,695,122
$ -	$ 4,002,412	$ 8,531,186	$ 1,569,231	$ -	$ -	$ -	$ -	$ -	$ 8,531,186	$ 8,531,186	$ -	$ 1,569,231	$ 1,569,231
$ -	$ 3,923,083	$ 8,654,771	$ 1,474,040	$ -	$ -	$ -	$ -	$ -	$ 8,654,771	$ 8,654,771	$ -	$ 1,474,040	$ 1,474,040
$ -	$ 3,905,342	$ 8,917,178	$ 1,406,233	$ -	$ -	$ -	$ -	$ -	$ 8,917,178	$ 8,917,178	$ -	$ 1,406,233	$ 1,406,233
$ -	$ 4,669,155	$ 11,034,357	$ 1,611,214	$ -	$ -	$ -	$ -	$ 2,126,920	$ 8,907,436	$ 11,034,357	$ -	$ 1,300,645	$ 1,300,645
$ -	$ 3,694,492	$ 9,036,574	$ 1,221,761	$ -	$ -	$ -	$ -	$ -	$ 9,036,574	$ 9,036,574	$ -	$ 1,221,761	$ 1,221,761
$ -	$ 3,681,322	$ 9,319,513	$ 1,166,680	$ -	$ -	$ -	$ -	$ -	$ 9,319,513	$ 9,319,513	$ -	$ 1,166,680	$ 1,166,680
$ -	$ 3,549,615	$ 9,300,603	$ 1,078,067	$ -	$ -	$ -	$ -	$ -	$ 9,300,603	$ 9,300,603	$ -	$ 1,078,067	$ 1,078,067
$ -	$ 3,479,343	$ 9,435,554	$ 1,012,695	$ -	$ -	$ -	$ -	$ -	$ 9,435,554	$ 9,435,554	$ -	$ 1,012,695	$ 1,012,695
$ -	$ 3,470,476	$ 9,740,911	$ 968,026	$ -	$ -	$ -	$ -	$ -	$ 9,740,911	$ 9,740,911	$ -	$ 968,026	$ 968,026
$ 4,183,000	$ 160,642,000	$ 262,508,000	**$ 98,900,000**	$ 3,230,000	**$ 1,400,000**	$ 2,869,904	**$ 870,742**	$ 49,777,514	$ 212,729,935	**$ 262,507,000**	$ 34,077,824	$ 63,058,141	**$ 97,136,000**

Capital 20 yr FV	***O&M 20 yr FV***	***Capital 20 yr NPV***	***O&M 20 yr NPV***	***Capital 20 yr FV***	***O&M 20 yr FV***	***Capital 20 yr NPV***	***O&M 20 yr NPV***
$ 3,230,000	***$ 1,380,000***	***$ 2,870,000***	***$ 871,000***	***$ 47,651,000***	***$ 122,353,000***	***$ 34,078,000***	***$ 50,166,000***