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Site Management Plan

Solvent Dock Area
Former Lockheed Martin French Road Facility
Utica, New York

October 2009

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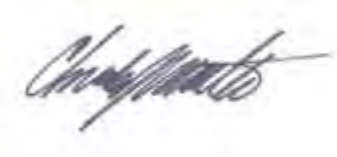

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Site Management Plan

Solvent Dock Area
Former French Road Facility
Utica, New York

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Acronyms

AOC	area(s) of concern
ASP	analytical services protocol
BBL	Blasland, Bouck, & Lee, Inc,
bgs	below ground-surface
CAMP	*Community Air Monitoring Plan*
C/D	construction/demolition
CMIP	*Corrective Measures Implementation Plan*
CMS	*Corrective Measures Study*
ConMed	ConMed Corporation
DER	NYSDEC Department of Environmental Remediation
DSHM	NYSDEC Division of Soil and Hazardous Materials
ECs	engineering controls
ECL	environmental conservation law
GCTS	groundwater collection and treatment system
GE	General Electric Company
HASP	*Health and Safety Plan*
HDPE	high-density polyethylene
H:V	horizontal to vertical
ICM	interim corrective measure
ICs	institutional controls
IRM	interim remedial measure
MAC	Materials Acquisition Center
MMC	Martin Marietta Corporation
MNA	monitored natural attenuation
MW	monitoring well
NYCRR	New York Codes, Rules, and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
O&M	operations and maintenance

OCIDA	Oneida County Industrial Development Agency
OM&M	operation, maintenance, and monitoring
OSWER	Office of Solid Waste and Environmental Restoration
PCBs	polychlorinated biphenyls
PID	photo-ionization detector
PZ	piezometer
QAPP	*Quality Assurance Project Plan*
QA/QC	quality assurance/quality control
RUA	Restrictive Use Agreement
SCO	soil-cleanup objective
SMP	*Site Management Plan*
SoMP	*Soil Management Plan*
SPDES	State Pollutant Discharge Elimination System
SSDS	sub-slab depressurization system
SWMU	solid-waste management unit
TAL	target-analyte list
TCL	target-compound list
TOGS	*Technical and Operational Guidance Series*
USEPA	U.S. Environmental Protection Agency
VI	vapor intrusion
VMP	vapor-monitoring point
VOC	volatile organic compound
VPGAC	vapor-phase granular activated-carbon
WWTP	wastewater treatment plant

1. Introduction and Description of Corrective Measures Program

1.1 Introduction

This *Site Management Plan* (SMP) was prepared in connection with the implementation of corrective measures at the Solvent Dock Area (hereafter referred to as the "Site") at the former Lockheed Martin French Road Facility in Utica, New York pursuant to the October 3, 2008 New York State Department of Environmental Conservation (NYSDEC) "Order on Consent" (the Order) (CO 6-20080321-5), and as presented in the *Corrective Measures Study Report* (CMS Report, ARCADIS 2009a). The Site is being remediated in accordance with the Order. NYSDEC has yet to issue the "Statement of Basis" for the Site. Site management is a component of the remedial process and will be implemented after NYSDEC has approved this document. This document was prepared before corrective measures at the Site have been completed. Lockheed Martin, however, will implement the Site-management practices described in this SMP to properly manage residual contamination as the company completes corrective measures at the Site.

1.1.1 General

Lockheed Martin entered into the Order with NYSDEC requiring corrective measures to be implemented at the Former French Road Facility in Utica, New York. A map of the Site location is shown in Figure 1. The Site facility is shown in Figure 2. A property survey map is included as Appendix A. The Order identifies five areas of concern (AOC) for the Site:

- AOC 1— Groundwater
- AOC 2— Soil-Vapor Migration/Indoor Air
- AOC 3— Soil
- AOC 4— Existing Remedial System (Groundwater Collection and Treatment System [GCTS])
- AOC 5— Miscellaneous Tanks

The Order requires Lockheed Martin to investigate each of these AOC and develop and implement corrective measures to remediate or mitigate contaminated media at the Site. The results of historic and recent remedial investigations indicate the presence of subsurface contamination (groundwater) at the Site. Based on the detection of subsurface contamination, Lockheed Martin implemented interim remedial measures (IRMs) at the Site. The IRMs began in 1996 with the construction and operation of a GCTS. A sub-slab depressurization system (SSDS) was installed as an IRM and placed in operation in July 2008.

This SMP will be used in managing corrective actions at the Site and to limit any potential exposure to contaminated environmental media (groundwater and soil gas) until it is no longer required by NYSDEC. This SMP was prepared by ARCADIS on behalf of Lockheed Martin, in accordance with the requirements in the NYSDEC Division of Environmental Remediation (DER) *Technical Guidance for Site Investigation and Remediation* (DER-10), dated December 2002; draft generic template for developing an SMP dated May 2007, (ECL 27-1318); and NYSDEC guidelines. This SMP addresses implementation of institutional controls (ICs) and engineering controls (ECs) expected to be part of the final Site remedy.

1.1.2 Purpose

The Site contains contaminated groundwater and soil gas that has remained during implementation of IRMs. This SMP describes the ECs likely to be incorporated into the final Site-remedy to properly manage residual contamination and waste materials that may be generated in the future, and to ensure protection of public health and the environment. These ECs are also identified as corrective measures and remedial systems for the Site.

ICs restrict Site use and require operation, maintenance, monitoring, and reporting measures for all ECs and ICs. This SMP includes procedures to be followed to ensure compliance with the ECs and ICs that will be part of the final Site remedy. This plan is subject to change by NYSDEC.

In March 1996, Lockheed Martin transferred ownership of the former Lockheed Martin facility to Pinnacle Park, Inc. Pinnacle Park subsequently transferred the property to and leased it back from the Oneida County Industrial Development Agency (OCIDA). A ~~"R~~estrictive Use Agreement" (RUA) was attached to the deed recorded with the Oneida County Clerk's Office. The RUA includes a number of use restrictions relating to the disturbance of subsurface soils (i.e., ~~"N~~o Excavation Areas") as well as a prohibition on

using the property for residential purposes. These restrictions were imposed by Lockheed Martin to protect the integrity of the remedial system it had installed, and are enforced by Lockheed Martin at its discretion. Section XI (D) of the Order provides a mechanism for NYSDEC to request the recording of an instrument (e.g., an environmental easement) be put into place to maintain Site ICs and ECs if requested by NYSDEC after approval of the final report relating to the final corrective measures.

The SMP details the procedures to manage contaminated environmental media at the Site concurrent with the completion of corrective measures in accordance with the Order. These procedures include:

- Development, implementation, and management of all ECs and ICs;
- Development and implementation of monitoring systems and a "Monitoring Plan";
- Development of a plan to operate and maintain all treatment, collection, containment, or recovery systems [including, where appropriate, preparation of an "Operation and Maintenance Manual" (OMM)];
- Submittal of Site-management reports, performance of inspections and certification of results, communication of Site information to NYSDEC, and
- Defining criteria for termination of treatment system operation.

These procedures are contained in the following four plans, which are a part of this SMP: (1) an "Engineering and Institutional Control Plan" for implementation and management of ECs/ICs; (2) a "Monitoring Plan" for implementation of Site monitoring; (3) an "Operation and Maintenance Plan" for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a "Site Management Reporting Plan" for submittal of data, information, recommendations, and certifications to NYSDEC. Site management activities, reporting, and ECs/ICs certification will be scheduled according to an approved annual certification period. Important consideration regarding this SMP include:

- This SMP defines Site-specific implementation procedures for the Site.
- At the time this report was prepared, the SMP and all Site documents related to the *Corrective Measures Study* and corrective measures are

maintained at the NYSDEC Central offices in Albany, New York. At the time of SMP submission (October 2009), the Site documents can also be found in the following repository established for this project:

Utica Public Library
303 Genesee Street
Utica, NY 13501
(315) 735-2279

1.2 Site Background

1.2.1 Site Location and History

In the early 1950s, General Electric Company (GE) acquired approximately 55 acres of undeveloped land on French Road in Utica, New York and constructed a 500,000-square-foot manufacturing facility. Figure 1 presents a Site location map. The facility is located on the border of the City of Utica and the town of New Hartford. GE operations included manufacturing, assembly, and testing of electrical components for the defense and aerospace industries. GE operations continued until April 1993, when the facility was acquired by Martin Marietta Corporation (MMC). In March 1995, MMC merged with Lockheed Corporation to form Lockheed Martin Corporation. In March 1996, Lockheed Martin sold the property to Pinnacle Park, Inc., which subsequently transferred the property to and leased it back from Oneida County Industrial Development Agency (OCIDA). ConMed Corporation (ConMed), a medical supplies manufacturer and distributor, now occupies the facility under a lease with OCIDA. Lockheed Martin retains responsibility for environmental cleanup activities related to past releases at the Solvent Dock Area even though it no longer owns the property.

Groundwater in the northeast portion of the main manufacturing building (see Figure 2), in an area known as the Solvent Dock and an area along the northern-perimeter ditch, has been adversely affected by volatile organic compounds (VOCs). The former Solvent Dock and immediate vicinity (referred to as the Solvent Dock Area) included a 275-gallon fiberglass overflow-retention tank. This tank was used to store spent waste solvents, which were periodically sampled, pumped from the tank, and disposed of by waste haulers. The tank was removed in June 1990, and was observed to be dented and leaking fluid. The northern-perimeter ditch (along the northern property boundary) was an open drainage swale that received stormwater from the area north of the manufacturing building and conveyed the water, along with stormwater from the western portion of the property, to a manhole before eventual discharge to the municipal storm-sewer.

Since 1991, GE, MMC, and Lockheed Martin have completed groundwater investigations in these areas. In November 1994, Blasland, Bouck, & Lee, Inc. (BBL) completed an investigation of the facility storm-sewer in the Solvent Dock Area. The investigation determined that VOCs detected in the storm sewer were attributable to the discharge of VOC-contaminated groundwater into the northern perimeter ditch and infiltration of VOC-contaminated groundwater from the Solvent Dock Area into the storm sewer beneath the building.

In May 1995, BBL completed a *Storm Sewer Investigation Report*, which recommended that the contaminated portion of the storm-sewer flow be collected, treated, and discharged to meet proposed State Pollutant Discharge Elimination System (SPDES) VOC-effluent limitations. BBL evaluated remedial design alternatives to address the source of VOCs entering the storm sewer that would remediate the contaminated groundwater (in accordance with NYSDEC recommendations). The results of this evaluation were presented in the *Storm Sewer Basis of Design Report* (BBL 1995d).

Based on this report, BBL completed the final design of the French Road facility GCTS in October 1995. Construction of the system was completed in June 1996. The system collects groundwater from the Solvent Dock Area and the northern-perimeter ditch area, conveys the collected groundwater to a treatment building where VOCs are removed by a low-profile air stripper, and then discharges the treated effluent to the municipal stormwater system. A hydraulic and chemical groundwater-monitoring program was developed to evaluate the effectiveness of the GCTS for the Solvent Dock Area. This program, as presented in the *Ground-Water Sampling and Analysis Work Plan* (BBL 1998b), has been modified through monthly and quarterly correspondence with NYSDEC to accommodate the changing conditions over the life of the project.

In response to observed groundwater contamination at the Site (as described above), Lockheed Martin voluntarily installed and operated the GCTS and initiated an investigation of soil-vapor and indoor-air quality. Lockheed Martin and NYSDEC began developing an Order on Consent for the Site in 2007, which became effective on October 3, 2008. The Order identifies five AOC and requires further investigation and identification of corrective actions for each area. These investigations were completed in 2008, and the results are presented in the *CMS Report*. Supplemental investigations to the CMS are ongoing, and updates to this SMP will be made should they be warranted based on the findings of those investigations.

1.2.2 Geologic and Hydrogeologic Conditions

Site geology, as fully described in the *CMS Report*, consists of the following units:

- Fill (approximately 5–10 feet (ft.) thick) and naturally occurring undifferentiated overburden consisting of silt, sand, and gravel (maximum thickness of 20 ft.);
- Till consisting of dense gray-brown silty clay with fine sand and gravel (approximately 20–40 ft. thick); and
- The top of bedrock (Utica Shale), encountered at depths ranging from approximately 30 ft. below ground-surface (bgs) to 52 ft. bgs. The deepest Site boring was advanced to a total depth of 68.5 ft. bgs, where the Utica Shale was still present.

The till surface is observed at higher elevations beneath the building footprint as compared to elevations outside the building footprint. Till surface deepens in a radial pattern away from the building to the north, east, and south. This may be an artifact of excavation and/or removal of the shallow till at locations around the perimeter of the building during construction and utility installation (in the 1950s). The bedrock surface dips gently to the south.

1.2.2.1 Groundwater Occurrence

Groundwater occurs in the overburden and bedrock. Groundwater in the fill and undifferentiated overburden is unconfined, and occurs at a depth of approximately 2–11 ft. bgs. Water-elevation data and stratigraphic information indicate that groundwater in the till is also unconfined. Groundwater occurs in bedrock under semi-confined conditions. The dense till overlying the bedrock acts as a leaky confining layer. Groundwater exhibits a downward gradient at the Site (based on water levels collected as part of the CMS investigation). This indicates that the till provides strong resistance to vertical flow, and that little water moves through the till into bedrock.

1.2.2.2 Water-Elevation Data

Water-elevation data for the fill, undifferentiated overburden, and till show a complex array of water levels. Groundwater flows to the south in both the overburden and bedrock. Operation of the GCTS has controlled groundwater movement near the former Solvent Dock and modified the direction of groundwater flow to the northeast. Groundwater-elevation and groundwater-quality data suggest the potential for flow

along the storm-sewer line (beneath the facility footprint and headed east toward the catch basins outside the main facility, as shown in Figure 2) in a generally eastward direction, although a permeable backfill-material was not identified during GCTS-evaluation activities. However, the potential remains for groundwater to infiltrate the storm-sewer line beneath the eastern portion of the building.

1.3 Description of Corrective Measures Study Findings

1.3.1 Summary of *Corrective Measures Study* Findings

A brief summary of the *Corrective Measures Study Report* findings appears below.

1.3.1.1 Soil

Soil at the Site is not contaminated with VOCs, polychlorinated biphenyls (PCBs), or metals at concentrations above NYSDEC ―Restricted Use― Industrial Soil Cleanup Objectives."

1.3.1.2 On-Site and Off-Site Groundwater

Groundwater in the northeast portion of the main manufacturing building and the area referred to as the northern-perimeter ditch is contaminated by VOCs present at concentrations above NYSDEC *Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values*. The depth to groundwater in these areas is shallow, ranging from 2–7 ft. bgs.

The source of groundwater contamination is probably a former 275-gallon overflow-retention tank, which was located immediately north of the loading dock along the northern wall of the manufacturing building. The tank was removed as part of an IRM in 1990. Reports indicate that the overflow-retention tank was in poor condition (leaking) upon removal. As part of the tank removal, approximately 5 cubic yards of contaminated soil were removed for off-Site disposal. Analytical data for soil removed near the tank indicate no remaining soil contamination. Residual on-Site dissolved-phase constituents in groundwater are believed to result from isolated releases that contaminated both soil and groundwater. The inverts of former underground storage tanks were likely near or below the water table.

The source of groundwater contamination in the area of the northern-perimeter ditch has not been defined, but may be related to the former hazardous waste storage area at the western end of the present day maintenance building. Historic soil, groundwater, and surface water samples collected as part of the initial source-investigations did not determine a specific source of observed groundwater contamination. An evaluation of potential contaminant sources is scheduled as part of investigations supplemental to the CMS.

Groundwater contamination is found primarily in fill and shallow till. The water table is encountered near the bottom of the fill, typically within one-foot of contact with the underlying till. Groundwater contamination was observed primarily in wells screened either solely within the fill or within the fill and underlying till. Minimal groundwater contamination was observed in the bedrock interval. Hydropunch data collected from several vertical intervals within the till indicate decreased contamination with depth in the till. Grain-size analysis and hydraulic-conductivity testing show that the fill and till both have a very low capacity to transmit water. In other words, the fill and till exhibit very low permeability, which has naturally limited the migration of contaminated groundwater within the northeastern portion of the Site. Off-Site migration of groundwater from the Site has not been observed.

1.3.1.3 On-Site and Off-Site Soil Vapor

Sub-slab soil gas under the building footprint contains VOCs at concentrations that warrant monitoring and/or mitigation, in accordance with the New York State Department of Health (NYSDOH) *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006). Although the presumed source of some of the compounds in sub-slab soil gas is groundwater, the determination of whether sub-slab soil gas migrates to indoor air is inconclusive based on co-existing background sources. Current facility operations use some of the chemicals detected in both sub-slab soil gas and indoor air.

The potential for off-Site migration of soil gas was assessed [see *Addendum to the Vapor Intrusion Study Report for the Solvent Dock Area (VI Addendum*)]. Sampling data generated as part of the *VI Addendum* indicates that soil gas at sampling locations in three outbuildings north of the manufacturing building does not require mitigation. After further review of the data, Site hydrogeology, subsurface utilities, and the NYSDOH matrix, the exposure pathway for off-Site migration of sub-slab soil gas was deemed incomplete. Site conditions suggest that the migration of soil gas from the Solvent Dock Area is unlikely, and future soil-gas mitigation efforts should focus

primarily on the manufacturing building. As requested by NYSDEC, continued evaluation of soil-gas migration from the Site (specifically, to the east) is underway as part of supplemental investigations to the CMS.

1.3.1.4 Underground Storage Tanks

A solid-waste management unit (SWMU) matrix identifying potential areas of investigation was created and submitted to NYSDEC. Within this SWMU matrix (included as Attachment 3-2 to the Order: ~~T~~able 1"), a *Phase I Environmental Site Assessment* (BBL 1995c) of the property identified 35 tanks at the former Lockheed Martin facility. Of these 35 tanks, 25 were listed as being closed and/or removed. Ten, however, were indicated as ~~in~~ use," and their status was not confirmed before the SWMU matrix was submitted to NYSDEC. The *Tank Status Report* (December 2008) was submitted to NYSDEC summarizing the findings on these 10 tanks and addressing what has been identified as AOC 5 in Attachment 2 [~~C~~orrective Measures Implementation Plan," (CMIP)] to the Order.

The *Tank Status Report* found that nine of the 10 tanks at the Site were identified as having an unknown status when the SWMU matrix was submitted to NYSDEC. Each of these tanks is either closed or inactive, except for Tank 18, which is actively used to store fuel for a backup generator for the ConMed facility. None of these nine tank locations has any history or indication of spills, leaks, or other conditions that may have affected soil and/or groundwater at the Site. As such, the *Tank Status Report* concluded that no further investigation into the status of these tanks was required.

The tenth tank (Tank 19) was associated with the Materials Acquisition Center (MAC). The MAC is a former GE building constructed in 1988 and separate from the French Road Facility (north of the manufacturing building, in a light-industrial park in Utica). This tank is therefore not considered part of the former Lockheed Martin facility as defined by the Order. NYSDEC commented on the December 1, 2008 version of the *Tank Status Report* (included in an e-mail dated January 23, 2008) that the cleaning/removal of the contents of the wastewater treatment plant (WWTP) tanks should be confirmed. Lockheed Martin is currently completing that confirmation.

1.4 Description of Corrective Measures

The Site is currently undergoing corrective measures, in accordance with the Order and as defined in the *CMS Report*. The corrective measures implemented or selected for implementation at the Site include:

- Groundwater
    - Continued hydraulic containment, with treatment and discharge from the current GCTS
    - Monitored natural attenuation (MNA)
    - Site management
- Soil
    - Site management
- Soil Vapor/Indoor Air
    - Continued operation and enhancement of the SSDS with active-extraction wells for vapor-intrusion (VI) mitigation
    - Site management

Each corrective measure is more fully described in the following sections.

1.4.1 Removal of Contaminated Materials from the Site

Contaminated groundwater (via the on-Site GCTS) is removed, and contaminated soil-gas (via the on-Site SSDS) is being actively mitigated. Removed materials are treated by their respective systems and then discharged to the environment in accordance with federal, state, and local requirements.

1.4.2 On-Site and Off-Site Treatment Systems

Treatment systems associated with the Site include:

- Site-cover system
- Groundwater collection and treatment system
- Monitored natural attenuation
- Sub-slab depressurization system

The Site cover-system is comprised of the existing cover at the Site. This includes the one active facility (currently owned and operated by ConMed Corporation) as well as several outbuildings, paved roads, parking lots, and landscaped cover (e.g., sod, bushes, and trees). The GCTS was installed as an interim corrective measure (ICM) in June 1996 in response to the detection of VOCs in stormwater attributed to the discharge of VOC-contaminated groundwater into the northern-perimeter ditch and infiltration of VOC-contaminated groundwater into the stormwater pipe beneath the manufacturing building. The GCTS collects groundwater from two under-drains and conveys the collected groundwater to a treatment building where VOCs are removed by a low-profile air stripper. Treated groundwater is discharged to the municipal stormwater system in compliance with the SPDES permit (No. NY0121894). The GCTS is more fully described in the ~~"G~~CTS Operation, Maintenance, and Monitoring (OM&M) Manual" (included as Appendix B).

The United States Environmental Protection Agency (USEPA) Office of Solid Waste and Environmental Restoration (OSWER) Directive 9200.4-17P (1999), defines MNA as the reliance on natural attenuation processes to achieve Site-specific remedial objectives within a reasonable period as compared to other methods. Under favorable conditions, these natural attenuation processes (biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological stabilization, transformation, or destruction of contaminants) act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil and groundwater. The time required for these processes to lower contaminant concentrations to levels that protect human health and the environment varies widely among different hydrogeologic systems and different contaminants. When relying on natural attenuation processes for Site remediation, USEPA prefers processes that degrade or destroy

contaminants. In addition, USEPA generally expects that MNA will only be appropriate for Sites with a low potential for contaminant migration (USEPA 1999).

The SSDS is intended to initially vent the sub-slab in contaminated areas identified in the Solvent Dock Area. Its primary operational objective is to create a negative pressure below the building slab relative to the pressure above the slab, thus mitigating the potential migration (intrusion) of vapors into the building. Upon establishing an effective negative gradient across the building's underlying concrete slab, soil vapors from the vadose zone beneath the slab will be actively removed from the subsurface through the use of a blower, associated depressurization sumps, and piping network, with subsequent treatment via vapor-phase granular activated-carbon (VPGAC) and final dispersion via discharge to the atmosphere. As presented in the *Revised Work Plan for the Interim Corrective* Measure (ARCADIS 2008), an air-discharge permit is not required (per the NYSDEC *Air Guide 1 Guidelines*). The SSDS is more fully described in the "SSDS OM&M Plan" (included as Appendix C).

1.4.3 Residual Contamination

VOC-contaminated groundwater and soil vapor are present at the Site at concentrations exceeding applicable regulatory standards and guidance values. A summary of current Site conditions (as of the CMS), including data tables, maps, and figures for the Site, is provided in the *CMS Report*.

1.4.4 Engineering and Institutional Controls

Because residual waste materials are expected to remain at this Site, ECs and ICs will be implemented to protect public health and the environment in the future. The Site has four primary ECs (which have also been identified as corrective measures for the Site):

- The existing cover at the Site limits access to potentially contaminated media
- A GCTS collects, treats, and prevents off-Site migration of contaminated groundwater (defined by NYSDEC TOGS 1.1.1)
- Groundwater MNA
- An SSDS to mitigate soil-gas vapor intrusion into the building

ICs will be used to implement, maintain, and monitor the ECs. The ICs, each of which is specified in this SMP, consist of the following:

- All ECs must be operated and maintained as specified in this SMP
- All ECs must be inspected and certified at a frequency and in a manner defined in this SMP
- Groundwater, soil-gas, and indoor-air monitoring must be performed as defined in this SMP
- Data and information pertinent to Site management must be reported at a frequency and in a manner defined in this SMP
- On-Site environmental monitoring devices, including but not limited to groundwater-monitoring wells, vapor-monitoring points, and stormwater-outlet points, must be protected and replaced or properly abandoned, as directed by NYSDEC, to ensure continued functioning in the manner specified in this SMP

The Site is restricted by local zoning-ordinances and this SMP. Applicable Site restrictions are:

- All future Site activities that will disturb existing cover are prohibited unless they are conducted in accordance with the soil-management provisions in this SMP
- Zoning ordinances for Utica and New Hartford prevent the use of the Site for other than industrial or commercial uses

NYSDEC has the authority to request implementation of additional ICs during and following completion of corrective measures for the Site.

These ECs/ICs should help achieve the Site-specific remedial goals defined in the Order as described below:

- Groundwater complies with applicable state groundwater-quality standards or guidance values, and groundwater contaminants do not pose a threat to human health or the environment

- Soil-vapor/indoor air-quality complies with applicable state or federal standards and guidance values, no regulatorily unacceptable risk is present, and human health is protected

2. Engineering and Institutional Control Plan

This section presents the ~~"E~~ngineering and Institutional Control Plan" (EC/IC Plan).

2.1 Introduction

This section summarizes ECs/ICs that will be implemented at the Site and describes the purpose of the ~~"E~~C/IC Plan."

2.1.1 General

Corrective measures are underway at the Site in accordance with the Order for the Solvent Dock Area (October 2008). The following corrective measures strategies and ECs/ICs have been implemented at the Site to date:

- Operation and maintenance of the GCTS;
- Operation and maintenance of the SSDS;
- Operation and maintenance of the MNA system; and
- Maintenance of Site cover and Site-monitoring activities in accordance with this SMP.

Details of the ~~"G~~CTS OM&M Manual," ~~"M~~NA Plan," and ~~"S~~SDS OM&M Plan" are discussed briefly below and included in the respective manuals (appended herein as Appendices B, C, and D, respectively).

Because constituents are present at the Site in groundwater and soil gas at concentrations that exceed regulatory standards and guidance values, ECs/ICs will be implemented to protect human health and the environment. This ~~"E~~C/IC Plan" describes procedures for implementing and managing all Site ECs/ICs. The ~~"E~~C/IC Plan" is one component of the SMP and is subject to requests for revision by NYSDEC.

2.1.2 Purpose

The purpose of the ~~"E~~EC/IC Plan" is to provide the following information:

- A description of all Site ECs/ICs
- The basic operation and intended role of each implemented EC/IC
- A description of the ICs' key components
- A description of features that should be evaluated during each annual inspection and compliance-certification period
- A description of plans and procedures to be followed in implementing ECs/ICs
- Any other provisions necessary to identify or establish methods for implementing ECs/ICs required by the Site corrective-actions

2.2 Engineering-Control Components

This section discusses the engineering-control systems at the Site to remedy the Solvent Dock Area, and the criteria for terminating those EC systems and completing corrective actions at the Site.

2.2.1 Engineering-Control Systems

The selected corrective actions described in the *CMS Report* were chosen because they protect human health and the environment, comply with applicable state and federal requirements or others relevant and appropriate to the corrective measures, and are cost-effective. The corrective measures use permanent solutions and appropriate technologies to collect and treat most of the groundwater containing constituents at concentrations exceeding NYSDEC groundwater standards, as well as mitigating soil vapor that exceeds NYSDOH criteria. EC systems at the Site include the GCTS, MNA, SSDS, and Site-cover system. Descriptions of the ~~"C~~Conceptual Remedial Approach," ~~"S~~System Design and Installation," and ~~"S~~System OM&M" for each of these is provided below. Excavation of contaminated soils or debris or their disposal off-Site is

not planned at this time. A "Soil Management Plan" (SoMP) is included as section 2.3.1, below, because of the possibility that additional monitoring wells for vapor or groundwater may be installed and thus small quantities of soil cuttings may require disposal. This plan outlines the general procedures required in the event that the cover system and underlying residual contamination are disturbed.

2.2.1.1 Cover System

Conceptual Remedial Approach— The existing cover system prevents exposure to contaminated environmental media (groundwater and soil gas) at the Site. The cover system comprises the sole active manufacturing facility (currently owned and operated by ConMed Corporation) as well as several outbuildings, paved roads, and parking lots. In addition, cover in several areas consists of landscaping (e.g., sod, bushes, and trees), which helps restrict access to contaminated groundwater. The Site layout is indicated in Figure 2.

System Design and Installation— The cover system is in place and maintained by the current property/building lessee/operator (ConMed Corporation).

System OM&M— The cover system is operated and maintained by the current property/building lessee/operator (ConMed Corporation).

2.2.1.2 Groundwater Collection and Treatment System

Conceptual Remedial Approach— The GCTS was installed as an ICM in June 1996 in response to the detection of VOCs in stormwater attributed to the discharge of VOC-contaminated groundwater into the northern-perimeter ditch and infiltration of VOC-contaminated groundwater into the stormwater pipe beneath the manufacturing building. This system collects groundwater from two under-drains and conveys the collected groundwater to a treatment building where VOCs are removed by a low-profile air stripper. Treated groundwater is discharged to the municipal stormwater system in compliance with the SPDES permit (No. NY0121894).

The GCTS, identified in the Order as AOC 4, is designed to lower groundwater elevations near the existing stormwater pipe and thus reduce the potential for groundwater infiltration into the pipe. This was necessary to prevent the potential discharge of VOC-contaminated groundwater to Nail Creek (the eventual storm-sewer discharge point, as shown in Figure 1). The GCTS consists of a horizontal subsurface-drain installed below the groundwater table in the Solvent Dock Area (currently the

loading dock area). The drain runs parallel to, and is hydraulically upgradient (northeast) of, the stormwater pipe. The drain flows to a groundwater-collection sump (located in a below-ground vault) equipped with two pumps actuated by high-level switches. The pumps transfer the water to a treatment system consisting of a low-profile air stripper before discharging the treated water to a stormwater pipe in the northeast portion of the facility under the requirements of an SPDES permit (Outfall No. 2). This stormwater pipe connects to the public stormwater sewer, which discharges to Nail Creek.

The GCTS also includes a second under-drain system installed along the northern property boundary beneath a former drainage ditch. Before the GCTS was installed, groundwater discharged to the ditch. The under-drain system collects groundwater in a second groundwater-collection sump pumped to the air stripper and subsequently discharged under the requirements of a SPDES permit. The drainage ditch was replaced with a subsurface high-density polyethylene (HDPE) pipe and series of catch basins. The HDPE pipe was designed and installed to convey surface water from the western portion of the facility to the eastern corner of the property. The pipe and catch basins also collect water from the area of the drainage ditch. Operation of the under-drain in combination with the stormwater pipe system eliminates discharge of groundwater to the surface-water system.

System Design and Installation— As stated above, the GCTS was installed in June 1996 as an ICM and has been operational since. Details on the system construction are provided in the *French Road Facility Ground-Water Collection and Treatment System* document and associated drawings (BBL 1995).

System OM&M— Procedures for operating and maintaining the GCTS are described in the ~~"~~GCTS OM&M Manual," included as Appendix B. Significant components of the manual include:

- Routine inspection and maintenance of the GCTS;
- Quarterly groundwater-elevation monitoring;
- Quarterly system-influent groundwater-chemistry analysis; and
- Monthly effluent sampling (for SPDES compliance).

2.2.1.3 Monitored Natural Attenuation

Conceptual Remedial Approach— MNA assumes that, under favorable conditions, natural attenuation processes (biodegradation, dispersion, dilution, sorption, volatilization and chemical or biological stabilization, transformation, or destruction of contaminants) act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil and groundwater.

System Design and Installation— As MNA is a natural process, no system design or installation components are required. However, the existing monitoring-well network is considered a system component. A description of the monitoring-well network for the MNA system (including a summary of the selection criteria for these wells) is described in the ~~"M~~MNA Plan," included as Appendix C.

System OM&M— Procedures for operating and maintaining the MNA system are described in the ~~"M~~MNA Plan." Its significant components include periodic groundwater monitoring (including analytical sampling and groundwater-elevation monitoring), periodic inspection of the monitoring-well network, and maintenance of the well network (as required).

2.2.1.4 Sub-Slab Depressurization System

Conceptual Remedial Approach— The SSDS' primary operational objective is to create a ~~"n~~negative pressure" below the building slab relative to the pressure above it, thus mitigating the potential migration (intrusion) of vapors into the building. Upon establishing an effective negative-gradient across the building's concrete slab, soil vapors from the vadose zone under the slab are actively removed from the subsurface through the use of a blower, associated depressurization sumps, and piping network, with subsequent treatment via VPGAC and final dispersion via discharge to the atmosphere.

System Design and Installation— As mentioned, the system was installed and began operation in July 2008 as an ICM and has been operational since. Details on the system construction are provided in the *Revised Work Plan for the Interim Corrective Measure* (ARCADIS 2008c), as well as in the ~~"S~~SSDS OM&M Plan," included as Appendix D.

System OM&M— Procedures for operating and maintaining the SSDS system are described in the "SSDS OM&M Manual," included as Appendix D. Significant components of the "MNA Plan" include:

- Routine inspection and maintenance of the system;
- Quarterly system monitoring (vapor sampling from each extraction sump and system effluent); and
- Semi-annual continuous-vacuum monitoring.

2.2.2 Criteria for Completion of Remediation/Termination of Corrective Measures

This subsection describes the completion criteria for remediation/termination of corrective measures.

2.2.2.1 Cover System

The cover system is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals (at a minimum annually) until Site remediation is considered complete by NYSDEC.

2.2.2.2 Groundwater Collection and Treatment System

The GCTS will not be discontinued without written approval by NYSDEC. The system will remain in place and operational until surface-water-discharge monitoring (per the SPDES permit) is no longer required by NYSDEC.

2.2.2.3 Monitored Natural Attenuation

The MNA system will be monitored until Site-related groundwater contaminants no longer pose a threat to human health or the environment.

2.2.2.4 Sub-Slab Depressurization System

The SSDS will not be discontinued without written approval by NYSDEC. The system will remain in place and operational until soil-vapor/indoor-air contamination is no longer present at levels constituting a regulatorily unacceptable risk and human health is protected (per the Order).

2.3 Institutional Controls Components

ICs are actions, such as legal controls, that minimize the potential for human exposure to contamination by ensuring appropriate land or resource use. Treatment or ECs will be used to address principal threats from wastes, and groundwater will be returned to its beneficial use whenever practicable. ICs can and do play an important role in remedies. ICs are used when contamination is first discovered, when remedies are ongoing, and when residual contamination remains on-Site at a level that does not allow for unrestricted use and unlimited exposure after cleanup.

Section XI (D) of the Order provides a mechanism for NYSDEC to request the recording of an instrument (such as an environmental easement) upon the agency's approval of the final report relating to the final corrective measures. NYSDEC will evaluate the need to record any future restrictions during the completion of corrective measures at the Site. The corrective measures recommended for the Site require a series of ICs (as presented below) and restrict use of on-Site groundwater to prevent its use as a potable-water supply. The following Site ICs will be implemented and adhered to under this SMP:

- Site owners and occupants must comply with all elements of this SMP
- All Site ECs must be operated, maintained, monitored, and certified at a frequency and in a manner defied in this SMP. ECs include:
    - Cover system
    - GCTS
    - MNA system
    - SSDS

Site restrictions include:

- All future Site activities that disturb the Site cover are prohibited unless they are conducted in accordance with the soil management provisions in this SMP
- Zoning ordinances for Utica and New Hartford prevent the use of the Site for other than industrial or commercial uses

- If use of the Pole Barn changes in the future to one where soil-vapor migration could threaten human health, the building will be reassessed before it can be occupied, per NYSDEC's April 24, 2009 conditional approval of the CMS

2.3.1 Soil Management Plan

Site activities associated with ConMed operations occur 24 hours a day, seven days a week. Periodic intrusive work by ConMed (such as utility repair) will be allowed at the Site. However, in the event that future intrusive work is required that will disturb the cover system (including utility repair), the intrusive work and modifications or repairs to the existing cover system will be performed in accordance with the SMP and SoMP. In the event that more extensive soil removal and/or management activities are scheduled at the Site, this SoMP will be revised and updated as appropriate.

Specifically, the Site occupant must notify Lockheed Martin and NYSDEC before any intrusive work is undertaken. Lockheed Martin will provide guidance (if appropriate) to the Site operator if the intrusive activities could potentially affect any or all Site ECs, or if the intrusive activities may result in potential exposure to contaminated media (groundwater and/or soil gas). If such a determination is made, the following soil and material management requirements must be adhered to (as defined in sections 2.3.1.1 through 2.3.1.13). If Lockheed Martin determines that the intrusive activities proposed by the Site occupant do not require management under this plan, the Site occupant will take full responsibility for completing the intrusive work in accordance with applicable regulations and guidance.

Intrusive construction work (if any) must also be conducted in accordance with the procedures defined in a Site *Health and Safety Plan* (HASP) and *Community Air Monitoring Plan* (CAMP). Lockheed Martin is responsible for the HASP and it was prepared in compliance with NYSDEC Division of Environmental Remediation (DER) *Technical Guidance for Site Investigation and Remediation* (DER-10) dated December 2002, 29 CFR 1910 and 29 CFR 1926, and all other applicable federal, state, and local regulations. Intrusive construction work (if any) must be certified by Lockheed Martin as compliant with the SMP and included in the periodic inspection and certification reports submitted under the "Site Management Reporting Plan" (see section 5). As stated, if Lockheed Martin determines that intrusive activities may potentially affect any or all Site ECs, or if the intrusive activities may result in potential exposure to contaminated media (groundwater and/or soil gas), the soil and material management requirements described in the following sections must be adhered to.

2.3.1.1 Soil Screening Methods

Visual, olfactory, and photoionization-detector (PID) screening and assessment will be performed by a qualified environmental professional during intrusive work (if any) into known or potentially contaminated material. Screening will be performed regardless of when the invasive work is done.

2.3.1.2 Stockpile Methods

Soil stockpiles are not anticipated for routine operations at the Site. If stockpiles are required, protecting the stockpile from erosion will follow the recommendations presented in the *New York Standards and Specifications for Erosion and Sediment Control— August 2005*. Stockpiles will be located where erosion and sediment hazards are low. The stockpile staging area(s) will be surrounded with a silt fence (or hay bales) at the toe of the slope. The side slope of the stockpile will be maintained at a ratio of 2:1 (H:V) or flatter. Stockpiles will be covered at all times and will be routinely inspected as described below. If the stockpile will not be used in the short term, a temporary grass cover will be provided. If the season prevents the establishment of a temporary grass cover, mulch or straw will be used to stabilize the stockpile until a grass cover can be provided. Stockpiles will be inspected at least weekly and after every storm. Inspections results will be recorded in a logbook maintained at the Site and available for inspection by NYSDEC.

2.3.1.3 Materials Excavation and Load Out

A qualified environmental professional will oversee all invasive work and the excavation and load-out of any excavated material. The Site owner or occupant and their contractors are solely responsible for safely executing all invasive and other work performed under this plan. The locations of Site utilities and easements will be investigated to determine whether they pose a risk or impediment to work planned under this SMP.

Loaded vehicles leaving the Site will be appropriately lined, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New York State Department of Transportation (NYSDOT) requirements (and all other applicable transportation requirements). If deemed necessary, a truck wash will be operated on-Site. A qualified environmental professional would then ensure that all outbound trucks are washed at the truck wash before leaving the Site until the intrusive work is complete.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-Site sediment tracking. All egress points for truck and equipment traffic leaving the Site will be kept clean of dirt and other materials derived from the Site during intrusive work. Adjacent streets will be cleaned, as necessary, to keep them free of Site-derived materials. Parties preparing documents submitted to the state, and parties performing this work, are responsible for safely performing all invasive work and for the structural integrity of excavations. On-Site mechanical processing of excavated residual waste-materials and contaminated soil is prohibited.

2.3.1.4 Materials Transport Off-Site

All materials will be transported by licensed haulers in accordance with appropriate local, state, and federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded. The contractor will determine the truck-transport route; however, the contractor will attempt to limit the transport of materials through residential areas and past sensitive Sites while maintaining overall transport safety. Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site. Egress points for trucks and equipment leaving the Site will be kept clean of dirt and other materials during intrusive activities at the Site. Trucks will be queued on-Site to minimize off-Site disturbance. Off-Site queuing will be prohibited. Material transported by trucks leaving the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used. If necessary, all trucks will be washed before leaving the Site. Truck-wash waters will be collected and appropriately disposed of off-Site.

2.3.1.5 Materials Disposal Off-Site

Disposal locations used during the previous calendar year will be identified and reported to NYSDEC in the annual *Site Management Report*. All residual contaminated materials excavated and removed from the Site will be treated as regulated material and will be disposed of in accordance with applicable regulations (including 6 NYCRR Part 360). If disposal of soil/fill from this Site is proposed for unregulated disposal, a formal request (along with an associated plan) will be made to NYSDEC's project manager. Unregulated off-Site management of materials from this Site is prohibited without formal NYSDEC approval. Material that does not meet unrestricted soil cleanup-objectives (SCOs) (see 6 NYCRR Part 375) is prohibited from going to a New York recycling facility (6 NYCRR Part 360-16 –Registration Facility").

The following documentation will be obtained and reported for each disposal location used in association with this project, to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws. Specifically, a letter must be sent to the receiving facility describing the material to be disposed of and requesting formal written acceptance of the material. This letter will state that material to be disposed of is contaminated material generated at an environmental remediation Site in the state of New York. The letter will provide the project identity and the name and phone number of a qualified environmental professional associated with the Site. The letter will include, as an attachment, a letter from all receiving facilities stating that they have received the correspondence (above) and have approved acceptance of the material at their facility. Non-hazardous contaminated soils (if any) taken off-Site will be managed as soils containing non-hazardous industrial waste, in accordance with applicable law.

The annual *Site Management Report* will include an accounting of the destination(s) of all material removed from the Site during work performed under this plan, including excavated soil, contaminated soil, historic fill, solid waste, hazardous waste, and non-regulated material. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the annual *Site Management Report*.

A "bill of lading" system or equivalent will document off-Site movement of non-hazardous wastes and contaminated soils. This information will be reported in the annual *Site Management Report*. Waste characterization will be performed for material disposed of off-Site, in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results, and quality assurance/quality control (QA/QC) will also be reported in the annual *Site Management Report*.

2.3.1.6 Materials Reuse On-Site

Staged materials will be sampled and analyzed before reuse. Based on the stockpile volume, grab soil-samples will be collected and analyzed for the constituents listed in 6 NYCRR Part 375-6.8(b). Soil-sampling analytical results will be compared to the "Restricted-Residential Use Soil Cleanup Objectives" as presented in 6 NYCRR Part 375-6.8(b). Soils meeting these objectives may be reused on Site. A qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material will not remain on-Site. NYSDEC will consider the use of specially designed, self-contained misting devices for dust

control, but NYSDEC must approve their use. Organic matter derived from clearing and grubbing of the Site may be reused on-Site as mulch.

2.3.1.7 Fluids Management

All liquids removed from the Site will be characterized, managed, and then disposed of through the on-Site GCTS. If the on-Site system is not appropriate to treat the liquids, they will be handled, transported off-Site, and disposed of in accordance with applicable local, state, and federal regulations. Liquids discharged into the sewer system, other than purge water from groundwater sampling or already permitted effluent-streams, will be addressed through approval by the Oneida County Department of Water Quality and Water Pollution Control. Dewatering fluids will not be recharged to the Site's land surface or subsurface; instead, they will be managed and processed through the GCTS, if possible. Purge water from groundwater sampling will likewise be discharged via the GCTS.

2.3.1.8 Backfill from Off-Site Sources

No areas at the Site are anticipated to require the use of backfill, except for repairs to the existing ECs and roads, or repairs by the Site occupant to utilities, when necessary. All materials proposed for import onto the Site will comply with provisions in this SMP before they enter the Site. Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the Site. All imported soils will meet the ~~"R~~Restricted-Residential Use Soil Cleanup Objectives" as presented in 6 NYCRR Part 375-6.8(b). The source of the imported soils (i.e., borrow source) is responsible for certifying that the soils are NYSDEC certified clean fill. Non-compliant soils will not be imported onto the Site without prior NYSDEC approval. Nothing in the approved SMP or its approval by NYSDEC should be construed as an approval for this purpose.

Soils that meet ~~"e~~exempt" fill requirements under 6 NYCRR Part 360, but which do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior NYSDEC approval. Nothing in this SMP should be construed as an approval for this purpose. Solid waste will not be imported onto the Site. Trucks entering the Site with imported soils will be securely covered with tight-fitting covers.

2.3.1.9 Stormwater Pollution Prevention

Silt fence and hay bales installed around stockpiles will be inspected once a week and after every storm. Results of inspections will be recorded in a logbook maintained at

the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately. All undercutting or erosion of the silt fence toe-anchor at the toe of the stockpile shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed with regard to replacing silt fencing damaged by weathering.

2.3.1.10 Contingency Plan

If previously unidentified contaminant sources are found during excavations on-Site, the product, sediment, and surrounding soils will be sampled. Chemical analytical work will be for full-scan parameters [target-analyte list (TAL) metals; target-compound list (TCL) volatiles and semi-volatiles, TCL pesticides, and PCBs]. Analyses will not be otherwise limited without NYSDEC approval. Unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to the NYSDEC project manager. These findings will also be included in daily and periodic reports via electronic media.

2.3.1.11 Community Air Monitoring Plan (CAMP)

Any significant investigation or remediation at the Site will require a CAMP, which will be prepared at that time. The CAMP will be prepared in accordance with the requirements that are provided in Appendix 1A of NYSDEC DER-10, *Generic Community Air Monitoring Plan*.

2.3.1.12 Odor, Dust, and Nuisance Control Plan

Odor Control Plan— No intrusive work conducted by the Site occupant (as part of OM&M activities, Site investigations, or other work) is expected to produce nuisance odors. In the remote case that nuisance odors are identified, work will be halted and odor source identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and any other complaints about the project. Implementation of all odor controls, including work stoppage, will be the responsibility of the qualified environmental professional (retained by Lockheed Martin) responsible for certifying the annual *Site Management Report*.

All necessary means will be employed to prevent on- and off-Site nuisances. At minimum, these steps will include: (a) limiting the area of open excavations, (b) shrouding open excavations with tarps and other covers, and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (a) direct load-out of soils to trucks for

off-Site disposal, (b) use of chemical odorants in spray or misting systems, and (c) use of staff to monitor odors in surrounding neighborhoods. Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-Site conditions or proximity to sensitive receptors, odor control will be achieved by sheltering excavation and handling areas under tented containment-structures equipped with appropriate air venting/filtering systems.

Dust Control Plan— No intrusive work conducted by the Site occupant (as part of OM&M activities, Site investigations, or other work) is expected to generate dust. If O&M-related intrusive work at the Site does generate dust, the following steps will be implemented to control it:

- Dust will be suppressed through the use of a dedicated on-Site water truck for road wetting. The truck will be equipped with a cannon capable of spraying water directly onto off-road areas, including excavations and stockpiles

- Larger Sites will be cleared and grubbed (if appropriate) in stages to limit the area of exposed, unvegetated soils vulnerable to dust production

2.4 Inspections and Notifications

2.4.1 Inspections

All systems installed on-Site will be inspected at the frequency specified in the SMP ~~-M~~Monitoring Plan" schedule (section 5.3.1, below). Inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to protect human health and the environment;
- If these controls comply with SMP requirements;
- Whether remedial performance criteria are achieved;
- Appropriate sampling and analysis of appropriate media during monitoring events;
- If Site records are complete and up to date; and

- Necessary changes to the remedial or monitoring systems.

Inspections will be conducted in accordance with the procedures set forth in the ~~M~~onitoring Plans" of this SMP (section 3). The reporting requirements are outlined in the ~~S~~ite Management Reporting Plan" (section 5). In the event of an emergency, such as a natural disaster or an unforeseen failure of any of the ECs, the Site will be inspected by a qualified environmental professional to verify the effectiveness of the applicable ECs/ICs, as required by NYSDEC.

2.4.2 Notifications

2.4.2.1 NYSDEC-acceptable Electronic Database

The following information is presented in Appendix E in an electronic-database format:

- A Site summary;
- The name of the current Site occupant and the party implementing the SMP for the Site;
- The location of the Site; and
- The current status of the Site remedial activity.

This information should be: (1) modified as conditions change, (2) revised in Appendix E of this document, and (3) submitted to NYSDEC in the annual *Site Monitoring Report*.

2.4.2.2 Non-Routine Notifications

Lockheed Martin will submit non-routine notifications to NYSDEC as required under section 10 (~~N~~otifications") of Attachment 3-1 to the Order.

3. Monitoring Plan

This section of the SMP provides the ~~M~~Monitoring Plan" and describes the measures for evaluating the performance and effectiveness of the implemented ECs in reducing or mitigating contamination at the Site.

3.1 Introduction

OM&M activities at the Site evaluate the performance of the corrective measures implemented. OM&M activities are performed in accordance with the current OM&M manuals and associated plans (Appendices B, C, and D of this SMP). The OM&M program described in this SMP relies, for the most part, on the methods, procedures, and schedules defined within those documents. The ~~M~~Monitoring Plan" described here is subject to change based on Site conditions and may be modified, as necessary. Changes to the ~~M~~Monitoring Plan" must be approved by NYSDEC before taking effect.

3.1.1 General

The ~~M~~Monitoring Plan" describes the measures for evaluating the performance and effectiveness of the implemented ECs in reducing or mitigating contamination at the Site. ECs at the Site include:

- Cover system
- GCTS
- MNA system
- SSDS

The ~~M~~Monitoring Plan" presented in this SMP may be modified based on Site conditions, and subject to NYSDEC approval.

3.1.2 Purpose

The ~~"M~~Monitoring Plan" presented here describes the methods to be used for:

- Sampling and analysis of appropriate media (e.g., groundwater, treated groundwater, soil gas, indoor air);
- Periodically evaluating Site information to confirm that the remedy continues to be effective by design;
- Preparing the necessary reports for the various monitoring activities;
- Assessing compliance with NYSDEC groundwater standards;
- Assessing compliance with SPDES effluent limitations;
- Assessing compliance with NYSDOH soil-gas and indoor-air guidance values; and
- Assessing achievement of the remedial performance criteria.

To adequately address these issues, the monitoring plans included as appendices to this SMP provide information on:

- Sampling locations, protocol, and frequency;
- All designed monitoring systems;
- Analytical sampling-program requirements;
- Reporting requirements;
- QA/QC requirements; and
- Annual inspection and certification.

Specifics on the monitoring and inspection programs for each EC are provided in the respective OM&M manuals and plans (included here as Appendices B, C, and D).

3.2 Engineering Control System Monitoring

The monitoring plan for each EC is described below. Specifically, this section provides the monitoring schedule, general equipment monitoring, system-monitoring devices and alarms, and discharge-permit limit requirements for each EC.

3.2.1 Monitoring Schedule

The monitoring and inspection programs for the GCTS, MNA system, and SSDS are provided in the respective OM&M manuals (included here as Appendices B, C, and D, respectively). The cover system will be inspected at least annually.

3.2.2 General Equipment Monitoring

The monitoring and inspection programs for the GCTS, MNA system, and SSDS equipment are provided in the respective OM&M manuals (included here as Appendices B, C, and D, respectively). The cover system will be inspected at least annually.

3.2.3 System-Monitoring Devices and Alarms

The system monitoring devices and alarms (including response actions) for the GCTS, MNA system, and SSDS are provided in the respective OM&M manuals (included herein as Appendices B, C, and D, respectively). The cover system will be inspected at least annually. ConMed, the Site occupant, is expected to additionally notify Lockheed Martin if a change or breach of the existing cover system occurs.

3.2.4 Discharge Permit Limit Requirements

The discharge-permit limits for the GCTS, MNA system, and SSDS are provided in the respective OM&M manuals (included here as Appendices B, C, and D, respectively). Discharge-permit limits do not apply to the cover system.

3.2.5 Sampling-Event Protocol

Sampling-event protocols for the GCTS, MNA system, and SSDS are provided in the respective OM&M manuals (included here as Appendices B, C, and D, respectively). Sampling-event protocols do not apply to the cover system.

3.3 Groundwater Monitoring Program

Groundwater will be monitored regularly to assess the performance of the remedies. The groundwater-monitoring program is described in full in the ~~"G~~CTS OM&M Manual" (Appendix B) and ~~"M~~NA Plan" (Appendix C).

3.3.1 Monitoring System Design

A network of existing monitoring wells and piezometers is designed to monitor Site groundwater conditions. The network of monitoring wells is designed to enable evaluation of the effectiveness of the corrective actions, in terms of both hydraulic control and groundwater-quality changes. Wells within the network have been located accordingly. The monitoring-well network is subject to change in the future based on Site conditions and data developed. Any changes will require NYSDEC approval.

Groundwater-quality samples will be collected from a network of wells as defined in section 3.3 of the ~~"M~~NA Plan" (Appendix C). Figure 4 of this SMP shows the locations of these wells. Table 1 of this SMP provides construction details for the monitoring wells to be sampled. Each well will be sampled for VOCs (USEPA Method 8260), pH, conductivity, temperature, and water levels.

Groundwater elevations will be measured in a network of wells as defined in section 3.2 of the ~~"G~~CTS OM&M Manual" (Appendix B). In general, all accessible monitoring wells will be measured quarterly. Figure 4 of this SMP shows the Site groundwater-monitoring network.

3.3.2 Groundwater Well Construction

Monitoring wells were installed at the Site as part of remedial investigations performed since 1991. Installation of additional monitoring wells is not planned at this time. Monitoring-well and piezometer construction details are provided in Table 1.

3.3.3 Monitoring Schedule

Groundwater-quality samples and elevation measurements will be collected from the specified monitoring-well network on the schedule defined in the ~~"G~~CTS OM&M Manual" and ~~"M~~NA Plan" (included as Appendices B and C, respectively).

3.3.4 Sampling-Event Protocol

All well sampling will be recorded on a groundwater-well sampling log (as presented in Appendix F). Other observations (e.g., well integrity) will be noted on the well-sampling log, which will serve as the inspection form for the groundwater-monitoring well network. Water-level measurements will be collected from the groundwater-elevation monitoring-well network (as defined in the ~~"M~~NA Plan" and ~~"G~~CTS OM&M Plan") using an electronic water-level meter and following the procedure described in Attachment 2 of the *Quality Assurance Project Plan* (QAPP) (ARCADIS 2009b). In general, monitoring wells will be purged and sampled following the procedures and methodologies described in the groundwater sampling SOP (included as Attachment 2 of the QAPP).

Groundwater samples will be submitted to the laboratory for the analyses defined in the ~~"G~~CTS OM&M Manual" and ~~"M~~NA Plan" (Appendices B and C of this SMP). The QAPP provides additional detail related to the groundwater-sample laboratory analyses. All groundwater samples (including QA/QC samples) are currently being submitted to TestAmerica Laboratories (TestAmerica) of Amherst, New York. The TestAmerica facility is a NYSDOH-approved laboratory (NY Lab ID No. 10026). Groundwater samples may be submitted to other NYSDOH-approved laboratories in the future. NYSDEC analytical-services protocol (ASP) Category B data deliverables will be provided for the groundwater-monitoring samples.

3.3.5 Groundwater Monitoring-Well Maintenance

If biofouling or silt accumulation has occurred in the monitoring wells, they will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (per the ~~"M~~onitoring Plan") if an event renders them unusable.

3.3.6 Well Replacement, Repairs, and Decommissioning

Wells in the monitoring-well network will be repaired or replaced based on assessments of their structural integrity and overall performance. Well decommissioning, for the purpose of replacement, will be reported to NYSDEC in advance and also in the annual report. Well decommissioning without replacement must receive prior approval by NYSDEC. Well abandonment will be performed in accordance with NYSDEC's ~~"D~~raft Monitoring Well Decommissioning Policy" (included as Appendix G of this SMP). Monitoring wells decommissioned because they have

been rendered unusable will be reinstalled in the nearest available location, unless otherwise directed by NYSDEC.

3.3.7 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the requirements of the Site QAPP.

3.3.8 Monitoring Reporting Requirements

Forms and any other information generated during regular monitoring and inspections will be kept on file. All forms and other relevant reporting formats used during monitoring inspections will be: (1) subject to NYSDEC approval and (2) submitted at the time of the annual *Site Management Report* (as specified in the ~~"R~~eporting Plan" of the SMP—section 5.4), as well as included in other reports mandated by the ~~"G~~CTS OM&M Manual" and ~~"M~~NA Plan."

3.3.9 Certifications

Site inspections and sampling will take place as outlined above. Inspection certification for all ICs and ECs will be submitted to NYSDEC on a calendar-year basis and must be submitted by March 31 of the following year. A qualified environmental professional, as determined by NYSDEC, will perform the inspections and certifications. Further information on certification requirements is outlined in the SMP's ~~"R~~eporting Plan" (see section 5 of this SMP).

3.4 Soil-Vapor/Indoor-Air Monitoring Program

Soil vapor and indoor air will be monitored regularly to assess the performance of the corrective actions.

3.4.1 Monitoring System Design

A network of existing vapor-monitoring points (VMPs) is designed to monitor soil-vapor conditions at the Site. The VMP network is designed to enable evaluation of the effectiveness of the corrective actions, in terms of both creating a negative pressure gradient and identifying soil-vapor-quality changes. The VMPs have been located

accordingly. The VMP network is subject to change in the future. Any changes will require written NYSDEC approval.

Soil-vapor and indoor-air quality samples will be collected from the VMPs annually. Figure 3 of this SMP shows the locations of the VMPs. Each VMP location will be sampled for VOCs in both soil vapor and indoor air. Pressure will be measured at the VMPs as defined in section 3.2 of the ~~"S~~SDS OM&M Manual" (Appendix D of this SMP).

3.4.2 Vapor-Monitoring-Point Construction

Site VMPs were installed as part of remedial investigations completed since 2005, and in accordance with NYSDOH's *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006). A schematic of a typical VMP is included as Figure 2 of the ~~"S~~SDS OM&M Plan" (Appendix D of this SMP).

3.4.3 Monitoring Schedule

Soil-vapor and indoor-air quality samples will be collected annually from the specified VMP network.

3.4.4 Sampling-Event Protocol

All VMP sampling will be recorded on a sampling log (as presented in Appendix G). Other observations (e.g., VMP integrity) will be noted on the sampling log, which will serve as the inspection form for the VMP network. In general, VMPs and indoor air will be sampled following the procedures and methodologies described in section 3.2 of the ~~"S~~SDS OM&M Plan" and in the QAPP. Soil-vapor and indoor-air samples will be submitted to the laboratory for analysis of VOCs by USEPA Method TO-15. The QAPP provides additional detail related to the soil-vapor- and indoor-air-sample laboratory analyses.

All soil-vapor and indoor-air samples (including QA/QC samples) are currently submitted to Centek Laboratories, LLC (Centek) of East Syracuse, New York. The Centek facility is a NYSDOH-approved laboratory (NY Lab ID No. 11830). The soil-vapor and indoor-air samples may be submitted to other NYSDOH-approved laboratories in the future. NYSDEC ASP Category B-data deliverables will be provided for groundwater-monitoring samples.

3.4.5 VMP Replacement, Repairs, and Decommissioning

VMPs will be repaired or replaced based on assessments of structural integrity and overall performance. VMP decommissioning, for the purpose of replacement, will be reported to NYSDEC in advance and in the annual report. VMP decommissioning without replacement must receive prior approval by NYSDEC. VMP abandonment will be completed by removing the VMP and sealing and restoring the ground surface as close as feasible to initial conditions. VMPs decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise directed by NYSDEC.

3.4.6 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the requirements of the Site QAPP.

3.4.7 Monitoring Reporting Requirements

Forms and any other information generated during regular monitoring and inspections will be kept on file. All forms and other relevant reporting formats used during the monitoring inspections will be: (1) subject to approval NYSDEC and (2) submitted at the time of the annual *Site Management Report* (as specified in the SMP's ~~"R~~Reporting Plan"), as well as in the reports mandated by the ~~"S~~SDS OM&M Manual."

3.4.8 Certifications

Site inspections and sampling will take place as outlined above. Inspection certification for all ICs and ECs will be submitted to NYSDEC on a calendar-year basis and must be submitted my March 31 of the following year. A qualified environmental professional, as determined by NYSDEC, will perform the inspections and certifications. Further information on the certification requirements is outlined in the SMP's ~~"R~~Reporting Plan" (see section 5 of this SMP).

3.5 Site-Wide Inspection

EC system-monitoring inspections will be performed on a defined regular schedule as specified in section 4 of this SMP. ~~"I~~nspection Checklist" forms will be completed during

these inspections (Appendix I of this SMP). These forms will compile sufficient information to assess:

- The condition and continued effectiveness of ECs;
- General Site conditions at the time of inspection;
- Site management activities being conducted;
- Compliance with permits and schedules included in the ~~G~~GCTS OM&M Manual," ~~M~~MNA Plan," and ~~S~~SSDS OM&M Manual"; and
- Completeness of Site records.

4. Operation and Maintenance Plan

This section of the SMP provides the ~~O~~Operation and Maintenance Plan for the Cover System, GCTS, MNA, and SSDS."

4.1 Introduction

This section provides a cursory overview of the ~~G~~GCTS OM&M Manual," ~~M~~MNA Plan," and ~~S~~SSDS OM&M Manual," which are provided as appendices to this SMP and will be kept at the Site along with the SMP. These manuals and plans include the basic measures necessary to operate and maintain the mechanical components of the selected corrective measures for the Site.

Operation and Maintenance Plan— The O&M plan includes the steps necessary to allow individuals unfamiliar with the Site to operate and maintain the mechanical components of the remedial systems. It includes an operation and maintenance contingency plan, and will be updated periodically to reflect changes in Site conditions. Any changes to this section due to changes in Site conditions or operation of these major components will be included as addenda to the SMP. Information on non-mechanical ECs is presented in section 2 (~~E~~EC/IC Plan") of this SMP. The ~~O~~Operation and Maintenance Plan" is not to be used as a stand-alone document, but is a component of the SMP. The ~~O~~Operation and Maintenance Plan" is subject to revision based on Site conditions and will require NYSDEC approval.

4.2 Engineering Control System Operation and Maintenance

This section describes the EC system-operation and maintenance.

4.2.1 Cover System

Although the cover system consists of multiple elements (Site buildings, paved roads and parking lots, gravel roads and driveways, and grassy areas), for monitoring, inspection, and maintenance purposes, the cover system is treated as a single unit.

4.2.1.1 Scope

The O&M contractor shall follow the monitoring, inspection, and maintenance procedures described below, unless otherwise directed by NYSDEC. In cases where an O&M procedure could be modified to improve efficiency, the O&M contractor may propose a modification in writing to NYSDEC. Any modifications to the procedures must be approved by NYSDEC before implementation. The O&M contractor will:

- Inspect, to the extent practicable, Site buildings, roads, parking lots, driveways and grassy areas annually
- Record all observations at the time of inspection on the inspection checklist (Appendix I of this SMP)
- Discuss with the Site occupant (currently ConMed) any changes or damage to the system and determine any planned repairs or further activities

4.2.1.2 System Startup and Testing

System startup and testing are not applicable to the cover system.

4.2.1.3 System Operation: Routine Operation Procedures

Routine-operation procedures are not applicable to the cover system.

4.2.1.4 System Operation: Routine Equipment Maintenance

The O&M contractor will inspect the cover system annually. Observations will be recorded at the time of the inspection. If no problems or deficiencies are observed, the

system will be noted as satisfactory. If adverse conditions are observed, or if other conditions exist which deviate from the norm and could (in inspector's opinion) be detrimental to the cover system, the system will be noted as not satisfactory and the locations and problems noted on the form. If the O&M contractor cannot complete the required visual inspection due to access issues, parked or staged vehicles, or other obstructions, the O&M contractor shall note these conditions as deficiencies.

Examples of areas and features to be inspected include:

- Surface cracks in the pavement, buildings, or other structures;
- Damage to the cover system due to vegetative growth (non-grassy areas);
- Physical damage to the cover system as a result of mechanical or natural conditions; and
- Changes or additions to components of the cover system.

4.2.1.5 System Operation: Non-Routine Equipment Maintenance

All of the annual inspections described above should also be performed if the Site occupant (currently ConMed) notifies Lockheed Martin of changes to the cover system. All forms and reports required for the annual inspection shall also be completed.

4.2.2 Groundwater Collection and Treatment System (GCTS)

The GCTS is fully described in section 2 of the ~~"G~~GCTS OM&M Manual" (Appendix B of this SMP).

4.2.2.1 Scope

The O&M contractor shall follow the monitoring, inspection, and maintenance procedures identified in the ~~"G~~GCTS OM&M Plan," unless otherwise directed by NYSDEC. In cases where an O&M procedure could be modified to be more efficient, the O&M contractor may propose a modification in writing to NYSDEC. Any modifications to the procedures must be approved by NYSDEC before implementation.

4.2.2.2 System Startup and Testing

A discussion of system startup and testing is provided in section 5 of the ~~"~~GCTS OM&M Manual" (Appendix B of this SMP).

4.2.2.3 System Operation: Routine Operation Procedures

A discussion of routine system-operation is provided in section 4 of the ~~"~~GCTS OM&M Manual" (Appendix B of this SMP).

4.2.2.4 System Operation: Routine Equipment Maintenance

A discussion of routine system-equipment maintenance is provided in section 5 of the ~~"~~GCTS OM&M Manual" (Appendix B of this SMP).

4.2.2.5 System Operation: Non-Routine Equipment Maintenance

A discussion of non-routine system-equipment maintenance is provided in section 5.5 of the ~~"~~GCTS OM&M Manual" (Appendix B of this SMP).

4.2.3 Monitored Natural Attenuation (MNA)

The MNA system is fully described in section 3 of the ~~"~~MNA Plan" (Appendix C of this SMP).

4.2.3.1 Scope

The O&M contractor shall follow the monitoring, inspection, and maintenance procedures identified in the ~~"~~MNA Plan," unless otherwise directed by NYSDEC. In cases where an O&M procedure could be modified to be more efficient, the O&M contractor may propose a modification in writing to NYSDEC. Any modifications to the procedures must be approved by NYSDEC prior to implementation.

4.2.3.2 System Startup and Testing

System startup is not applicable to the MNA system. A discussion of system testing is provided in section 3 of the ~~"~~MNA Plan" (Appendix C of this SMP).

4.2.3.3 System Operation: Routine Operation Procedures

Routine-operation procedures are not applicable to the MNA system.

4.2.3.4 System Operation: Routine Equipment Maintenance

Routine equipment maintenance is not applicable to the MNA system.

4.2.3.5 System Operation: Non-Routine Equipment Maintenance

Non-routine equipment maintenance is not applicable to the MNA system.

4.2.4 Sub-Slab Depressurization System (SSDS)

The SSDS is fully described in section 1.2 of the "SSDS OM&M Plan" (Appendix D of this SMP).

4.2.4.1 Scope

The O&M contractor shall follow the monitoring, inspection, and maintenance procedures identified in the "SSDS OM&M Manual," unless otherwise directed by NYSDEC. In cases where an O&M procedure could be modified to be more efficient, the O&M contractor may propose a modification in writing to NYSDEC. Any modifications to the procedures must be approved by NYSDEC prior to implementation.

4.2.4.2 System Startup and Testing

A discussion of system startup and testing is provided in section 3.1 of the "SSDS OM&M Plan" (Appendix D of this SMP).

4.2.4.3 System Operation: Routine Operation Procedures

A discussion of routine system-operation procedures is provided in section 3 of the "SSDS OM&M Plan" (Appendix D of this SMP).

4.2.4.4 System Operation: Routine Equipment Maintenance

A discussion of routine system-equipment maintenance is provided in section 4 of the ~~S~~SDS OM&M Plan" (Appendix D of this SMP).

4.2.4.5 System Operation: Non-Routine Equipment Maintenance

A discussion of non-routine system-equipment maintenance is provided in section 4 of the ~~S~~SDS OM&M Plan" (Appendix D of this SMP).

4.2.5 Maintenance Reporting Requirements

Maintenance reports and any other information generated during regular operations at the Site will be kept on file. All reports, forms, and other relevant information generated will be available to NYSDEC upon request and submitted annually as part of the *Annual Site Management Report*, as specified in section 5 of this SMP. System-specific maintenance reports will also be submitted at a frequency defined in the ~~G~~CTS OM&M Manual," ~~M~~NA Plan," or ~~S~~SDS OM&M Plan."

4.2.5.1 Routine Maintenance Reports

Appropriate checklists or forms will be completed during each routine maintenance event. Specific checklists/forms to be completed are defined in the ~~G~~CTS OM&M Manual," ~~M~~NA Plan," or ~~S~~SDS OM&M Plan." At minimum, the checklist/forms will include, but not be limited to, the following information:

- Date;
- Name, company, and position of individual(s) conducting maintenance activities;
- Maintenance activities conducted;
- Where appropriate, color photographs or sketches showing the approximate location(s) of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc. (attached to the checklist/form).

4.2.5.2 Non-Routine Maintenance Reports

Appropriate checklists or forms will be completed during each non-routine maintenance event. The specific checklists/forms to be completed are defined in the ~~"~~GCTS OM&M Manual," ~~"~~MNA Plan," or ~~"~~SSDS OM&M Plan."

4.2.6 Contingency Plan

A Site-specific HASP has been developed and is available on Site in the event of an emergency. Emergencies may include:

- Injury to personnel;
- Fire or explosion;
- Environmental release;
- Toxic substance exposure;
- Hazardous material spill; and
- Serious weather conditions.

Other situations might occur at the Site and require that corrective actions be implemented in an expedited manner. These situations include:

- Remedial- or mitigation-system shutdown;
- Power failure for an extended period; and
- Significant damage to or failure of remedial- or mitigation-system components.

Corrective action procedures are detailed in the ~~"~~GCTS OM&M Manual," ~~"~~MNA Plan," or ~~"~~SSDS OM&M Plan."

4.2.6.1 Emergency Contacts

In the event of an environmentally related situation or unplanned occurrence requiring assistance, the appropriate party from the emergency contact list should be notified.

Appropriate emergency response personnel should be contacted. The qualified environmental professional at ARCADIS' Albany, New York office should also be contacted promptly. Emergency contact information is included as Appendix J and also included in the Site-specific HASP.

4.2.6.2 Map and Directions to Nearest Health Facility

In case of an emergency, the O&M contractor should be aware of proper evacuation and/or medical-treatment procedures outlined in the Site-specific HASP. In the event of a medical emergency, the route to Faxton-St. Luke's Hospital is detailed below:

Faxton-St Luke's Hospital
1676 Sunset Avenue
New Hartford, NY
315.624.5200

4.2.6.3 Response Procedures

4.2.6.3.1 Emergency Contacts/Notification System

As appropriate, the fire department and other emergency responders will be notified immediately by telephone. The emergency telephone number list is provided in Appendix J of this SMP, as well as in the Site-specific HASP. The list is also posted prominently at the Site and made readily available to all personnel at all times.

The on-Site O&M contractor shall take the following steps in an emergency:

- Identify/verify the problem and its cause. If possible, the O&M contractor shall make a preliminary assessment of the severity of the problem. Immediate steps shall be taken to contain the problem, if necessary and safe to do so.

- Notify the proper authorities depending on the severity of the problem. At a minimum, the O&M contractor shall notify the qualified environmental

professional (ARCADIS), who will in turn notify Lockheed Martin. NYSDEC shall also be notified of any emergencies. The O&M contractor shall initiate a decision-making process for a course of action. Appropriate local/state/federal agencies shall also be contacted, as necessary.

- Make recommendations to NYSDEC, as appropriate, for corrective actions and an implementation schedule. If necessary, a more detailed assessment of the problem and evaluation of alternatives for corrective action shall be undertaken by the O&M contractor, subject to NYSDEC approval.

- Obtain NYSDEC authorization for the O&M contractor to implement any corrective actions, and

- The O&M contractor will implement a proper, safe, and effective corrective action as directed by NYSDEC.

5. Site Management Reporting Plan

5.1 Introduction

An annual *Site Management Report* will be submitted to NYSDEC by March 31 of the year following the calendar-year reporting period. The annual *Site Management Report* will be prepared in general accordance with NYSDEC Draft DER-10, *Technical Guidance for Site Investigation and Remediation* requirements. The "Site Management Reporting Plan" described below and its requirements are subject to revision by NYSDEC. The annual *Site Management Report* will:

- Identify all Site ECs and ICs;
- Evaluate the "EC/IC Plan" and the "Monitoring Plan(s)" for adequacy in meeting remedial goals;
- Assess the continued effectiveness of all Site ICs and ECs ;
- Certify the ECs/ICs;
- Report results of required periodic Site inspections; and
- Incorporate all deliverables generated during the reporting period, as specified in section 2 ("EC/IC Plan"), section 3 ("Monitoring Plan"), and section 4 ("Operation and Maintenance Plan").

The "Site Management Reporting Plan" is subject to NYSDEC revision.

5.2 Certification of Engineering and Institutional Controls

Information on ECs/ICs is presented in section 2 of this SMP. ECs/ICs will be inspected at a frequency described in section 5.3.1, and within the system-specific manuals and plan. After the last inspection of the reporting period, a Professional Engineer, licensed to practice in the state of New York, will sign and certify the document. The document will certify that:

- On-Site ECs/ICs are unchanged from the previous certification;

- On-Site ECs/ICs remain in place and are effective;
- Systems are performing as designed;
- Nothing has occurred that would impair the ability of the controls to protect public health and the environment;
- Nothing has occurred that would constitute a violation or failure to comply with any operation and maintenance plan for such controls; and
- NYSDEC and NYSDOH have Site access to evaluate continued maintenance of such controls.

The signed certification will be included in the annual *Site Management Report*.

5.3 Site Inspections

5.3.1 Inspection Frequency

All inspections will be conducted at a frequency specified within the specific plans or manuals. In general, the inspection frequency will be:

- The Site cover will be visually inspected annually;
- The GCTS will be inspected monthly, with quarterly performance monitoring. Monthly SPDES-compliance monitoring will also continue;
- The MNA system (i.e., groundwater-monitoring wells) will be inspected as part of the quarterly, semi-annual, and annual monitoring programs; and
- The SSDS will be inspected monthly, with performance monitoring completed quarterly (for instantaneous-vacuum measurements and vapor-stream sampling), semi-annually (for continuous-vacuum measurements), and annually (for soil-vapor and indoor-air sampling).

5.3.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring will be recorded on the appropriate forms for their respective systems. These forms are subject to NYSDEC revision. All applicable inspection forms and other records (all sampling data, system-maintenance reports, etc.) generated for the Site during the calendar year will be included in the annual *Site Management Report*.

5.3.3 Evaluation of Records and Reporting

The results of inspection and Site-monitoring data will be evaluated as part of the EC/IC certification to confirm that:

- ECs/ICs are in place, performing properly, and remain effective;
- The ~~M~~Monitoring Plan" is being implemented;
- Operation and maintenance are being conducted properly, based on the above items; and
- The Site remedy continues to protect human health and the environment and is performing as designed.

5.4 Site Management Report

The *Site Management Report* will be submitted annually by March 31 of the year following the calendar year reporting period and will include:

- EC/IC certification
- All applicable Site inspection forms and other records generated during the reporting period
- A summary of the discharge-monitoring data and/or information generated during the reporting period, with comments and conclusions
- Cumulative data-summary tables and/or graphical representations of contaminants of concern by environmental medium, including a list of all

compounds analyzed for, along with the applicable standards and with all exceedences highlighted

- Results of all analyses, copies of all laboratory data sheets (in electronic format), and the required laboratory-data deliverables for all points sampled during the previous calendar year

- A performance summary for all Site systems during the previous calendar year, including information such as:

    - The number of days the system(s) ran during the reporting period

    - Average system-statistics (such as flow) per day

    - A description of significant breakdowns and/or repairs, along with an explanation for any significant downtime

    - A summary of the performance and/or effectiveness monitoring

    - Comments, conclusions, and recommendations based on data evaluation

    - A description of the resolution of performance problems

- A Site evaluation addressing:

    - Compliance of the remedy with the requirements of the Site-specific Order

    - Performance and effectiveness of the remedy

    - Operation and effectiveness of all remedial systems including identification of any necessary significant repairs or modifications

    - Any new conclusions or observations regarding Site contamination based on inspections or data generated by the ~~"M~~Monitoring Plan" for the media being monitored

- Recommendations regarding any necessary changes to the remedy and/or ~~M~~Monitoring Plan"

- A figure(s) showing sampling and well locations and any significant analytical values at sampling locations, and

- Comments, conclusions, and recommendations, based on an evaluation of the information included in the report, regarding Site ECs/ICs

The *Site Management Report* will be submitted in hard-copy format to NYSDEC's central offices, located at 625 Broadway, Albany, New York 12233.

6. References

ARCADIS G&M. 1999 through 2005. *Quarterly Monitoring Reports for Solvent Dock Area Groundwater Treatment System.*

ARCADIS. 2007. *Vapor-Intrusion Study for the Solvent Dock Area*, August.

ARCADIS. 2008. *Work Plan to Evaluate Performance of the Groundwater Collection and Treatment System*. October.

ARCADIS. 2006a. *2006 Annual Monitoring Report for Solvent Dock Area Groundwater Treatment System.* April.

ARCADIS. 2006b. *Revised Work Plan for Storm Sewer Bedding Investigation*. August.

ARCADIS. 2006c. *Work Plan for Corrective Measures Study*, August.

ARCADIS. 2008a. *Addendum to the Vapor-Intrusion Study Report for the Solvent Dock Area*, February.

ARCADIS. 2008b. *Revised Work Plan for Soil and Groundwater Investigation*, April.

ARCADIS. 2008c. *Revised Work Plan for the Interim Corrective Measure*, April.

ARCADIS. 2008d. *Solvent Dock Area and West Lot Site Health and Safety Plan*. November.

ARCADIS. 2009a. *Corrective Measures Study Report*, March.

ARCADIS. 2009b. *Quality Assurance Project Plan*, August.

Blasland, Bouck & Lee, Inc. (BBL). 1995a. *French Road Facility Ground-Water Collection and Treatment System*. October.

BBL. 1995b. *Ground-Water Collection And Treatment System, Supplemental Information*, November.

BBL. 1995c. *Phase I Environmental Site Assessment, French Road Facility*, October.

BBL. 1995d. *Storm-Sewer Basis of Design Report.*

BBL. 1995e. *Storm-Sewer Investigation Report*. May.

BBL. 1998a. *Former Lockheed Martin Corporation French Road Facility, Monitoring Well 7 Analytical Results*, April.

BBL. 1998b. *Revised Solvent Dock and Northern-Perimeter Ditch Area, Ground-Water Sampling and Analysis Work Plan*. February.

EarthTech. 2006. *Vapor-Intrusion Study*, May.

New York State Department of Environmental Conservation (NYSDEC). 1998. *Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values.* June.

NYSDEC. 2005. *New York Standards and Specifications for Erosion and Sediment Control.* August.

NYSDEC. 2008. *Order on Consent Index Number CO 6-20080321-5*. October 3.

New York State Department of Health (NYSDOH). 2006. *Final— Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

O'Brien & Gere Engineers, Inc. 1993. *Ground Water Investigations, French Road Facility*. June.

USEPA 1999. Office of Solid Waste and Emergency Response (OSWER) Directive 9200.4-17P. 1999.

ARCADIS

Tables

ARCADIS

Table 1. Monitoring Well and Piezometer Construction Details, Site Management Plan, Solvent Dock Area, Former Lockheed Martin French Road Facility, Utica, New York.

Monitoring Well	Diameter/Material	Screen Length	Ground Surface Elevation	Top of PVC Riser Elevation	Well Depth (ft bgs)	Screen Depth (ft bgs)		Screen/Borehole Elevation		Hydrogeologic Unit Monitored	Date Installed	Consultant Name
						From (Top)	To (Bottom)	Top	Bottom			
MW - 1	4" PVC	10	507.53	506.80	17.2	7.0	17.0	500.5	490.5	Fill/Till	1991	O'Brien & Gere
MW - 2	4" PVC	15	504.98	504.69	16.5	1.5	16.5	503.5	488.5	Fill/Till	1991	O'Brien & Gere
MW - 3	2" PVC	10	506.90	509.30	13.0	3.0	13.0	503.9	493.9	Fill/Till	1991	O'Brien & Gere
MW - 4	2" PVC	10	506.98	506.73	14.0	4.0	14.0	503.0	493.0	Fill/Till	1991	O'Brien & Gere
MW - 5	2" PVC	10	504.56	504.46	14.0	4.0	14.0	500.6	490.6	Fill/Till	1991	O'Brien & Gere
MW - 6	2" PVC	10	505.95	508.58	15.0	5.0	15.0	501.0	491.0	Fill/Till	--	O'Brien & Gere
MW - 7	2" PVC	15	507.44	506.94	21.0	6.0	21.0	501.4	486.4	Fill/Till	1993	O'Brien & Gere
MW - 8	2" PVC	10	505.76	505.76	14.5	4.5	14.5	501.3	491.3	Fill/Till	1993	O'Brien & Gere
MW - 9	2" PVC	10	505.26	505.15	13.5	3.5	13.5	501.8	491.8	Fill/Till	1993	O'Brien & Gere
MW - 10	2" PVC	10	504.83	504.48	14.0	4.0	14.0	500.8	490.8	Fill/Till	1993	O'Brien & Gere
MW - 11	2" PVC	20	507.26	507.03	25.0	5.0	25.0	502.3	482.3	Fill/Till	1993	O'Brien & Gere
MW - 12	2" PVC	10	508.59	508.34	23.4	13.0	23.0	495.6	485.6	Fill/Till	--	--
MW - 13S	2" PVC	5	506.27	506.03	7.0	2.0	7.0	504.3	499.3	Fill	2008	ARCADIS
MW - 13T	2" PVC	10	506.11	505.68	20.0	10.0	20.0	496.1	486.1	Till	2008	ARCADIS
MW - 13BR	2" PVC	10	506.48	506.28	45.0	35.0	45.0	471.5	461.5	Bedrock	2008	ARCADIS
MW - 14S	2" PVC	10	508.22	507.85	16.0	6.0	16.0	502.2	492.2	Undifferentiated Overburden	2008	ARCADIS
MW - 14BR	2" PVC	10	508.20	507.95	67.2	57.2	67.2	451.0	441.0	Bedrock	2008	ARCADIS
MW - 15S	2" PVC	10	507.66	507.46	20.0	10.0	20.0	497.7	487.7	Undifferentiated Overburden	2008	ARCADIS
MW - 15BR	2" PVC	10	507.54	507.29	67.6	57.6	67.6	449.9	439.9	Bedrock	2008	ARCADIS
PZ - 2	1.5" PVC	5	503.80	503.82	10.3	5.0	10.0	498.8	493.8	Fill/Till	--	--
PZ - 4	1.5" PVC	5	505.50	505.51	14.3	9.0	14.0	496.5	491.5	Fill/Till	--	--
PZ - 5	1.5" PVC	5	508.44	508.29	10.7	5.7	10.7	502.7	497.7	Till	--	--
PZ - 6	1.5" PVC	5	508.52	508.37	10.4	5.4	10.4	503.1	498.1	Till	--	--
PZ - 7	1.5" PVC	5	508.51	508.36	10.2	5.0	10.0	503.5	498.5	Till	--	--
PZ - 8	1.5" PVC	10	508.43	508.23	16.0	6.0	16.0	502.4	492.4	Till	2008	ARCADIS
PZ - 9	1.5" PVC	5	508.55	508.08	10.0	5.0	10.0	503.6	498.6	Till	2008	ARCADIS
PZ - 10	1.5" PVC	5	508.44	508.14	12.0	7.0	12.0	501.4	496.4	Fill	2008	ARCADIS
PZ - 11	1.5" PVC	2	505.93	505.82	8.5	6.5	8.5	499.4	497.4	Fill	2008	ARCADIS
PZ - 12	1.5" PVC	5	505.94	505.84	10.5	5.5	10.5	500.4	495.4	Fill	2008	ARCADIS
PZ - 13	1.5" PVC	2	504.08	503.85	8.5	6.5	8.5	497.6	495.6	Fill	2008	ARCADIS
PZ - 14	1.5" PVC	5	504.13	504.05	9.0	4.0	9.0	500.1	495.1	Fill	2008	ARCADIS
PZ - 15	1.5" PVC	2	504.72	504.43	8.5	6.5	8.5	498.2	496.2	Fill	2008	ARCADIS
PZ - 16	1.5" PVC	5	504.70	504.53	9.5	4.5	9.5	500.2	495.2	Fill	2008	ARCADIS

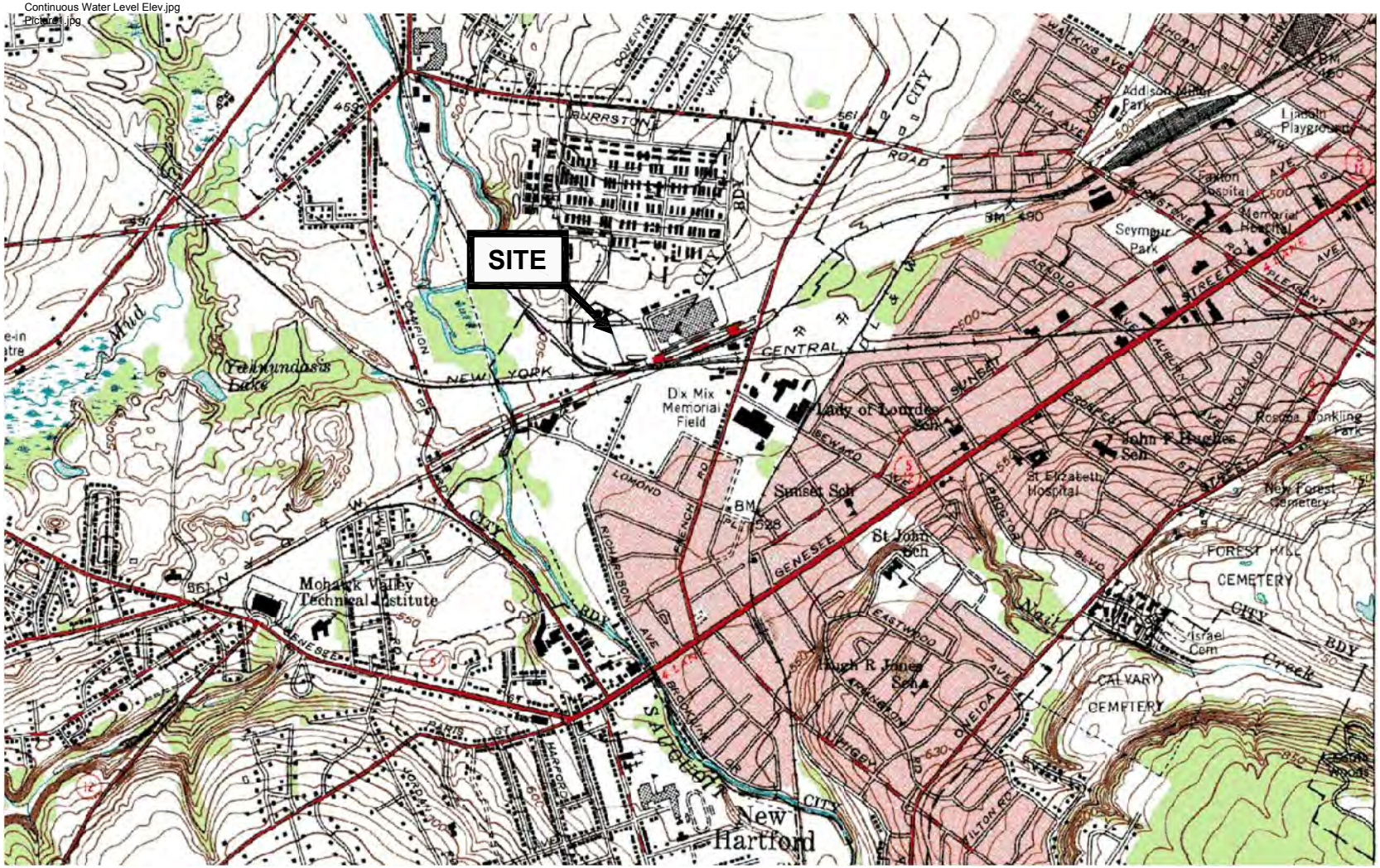
All elevations are reported as feet mean sea level (ft msl)
Construction details for MW-1, MW-6, PZ-2, and PZ-4 through PZ-7 estimated based on field measurements
-- = Unknown detail
Top of PVC pipe elevations for PZ-11 through PZ-16 are applicable to groundwater levels collected in December 2008.
Survey data is referenced horizontally to the NAD83 and projected on the New York State Plane Coordinate System (Central Zone)
The reference vertical benchmark is the finished floor elevation of the southeasterly corner of the Boiler House Building (Elevation 506.50 feet)

ARCADIS

Figures

CITY:(MAHWAH) DIV/GROUP:(ENRI- 1) DB:(JG LD:(Opt) PIC:(Opt) PM:(CM) TM:(BM) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Mahwah\ACT\NJ0010000\0001\00003\2009-08\FIG 1 SITE-LOCATION.dwg LAYOUT: 1 SAVED: 8/18/2009 3:54 PM ACADVER: 17.1S (LMS TECH) PAGESETUP: ----PLOTSTYLETABLE: ----PLOTTED: 8/18/2009 3:55 PM BY: GONZALEZ, JAMES

XREFS: IMAGES: PROJECTNAME: ----
Continuous Water Level Elev.jpg
Picture1.jpg



0 12000 24000
SCALE IN FEET

SITE MANAGEMENT PLAN
FORMER LOCKHEED MARTIN, FRENCH ROAD PROPERTY
UTICA, NEW YORK

SITE LOCATION MAP

ARCADIS

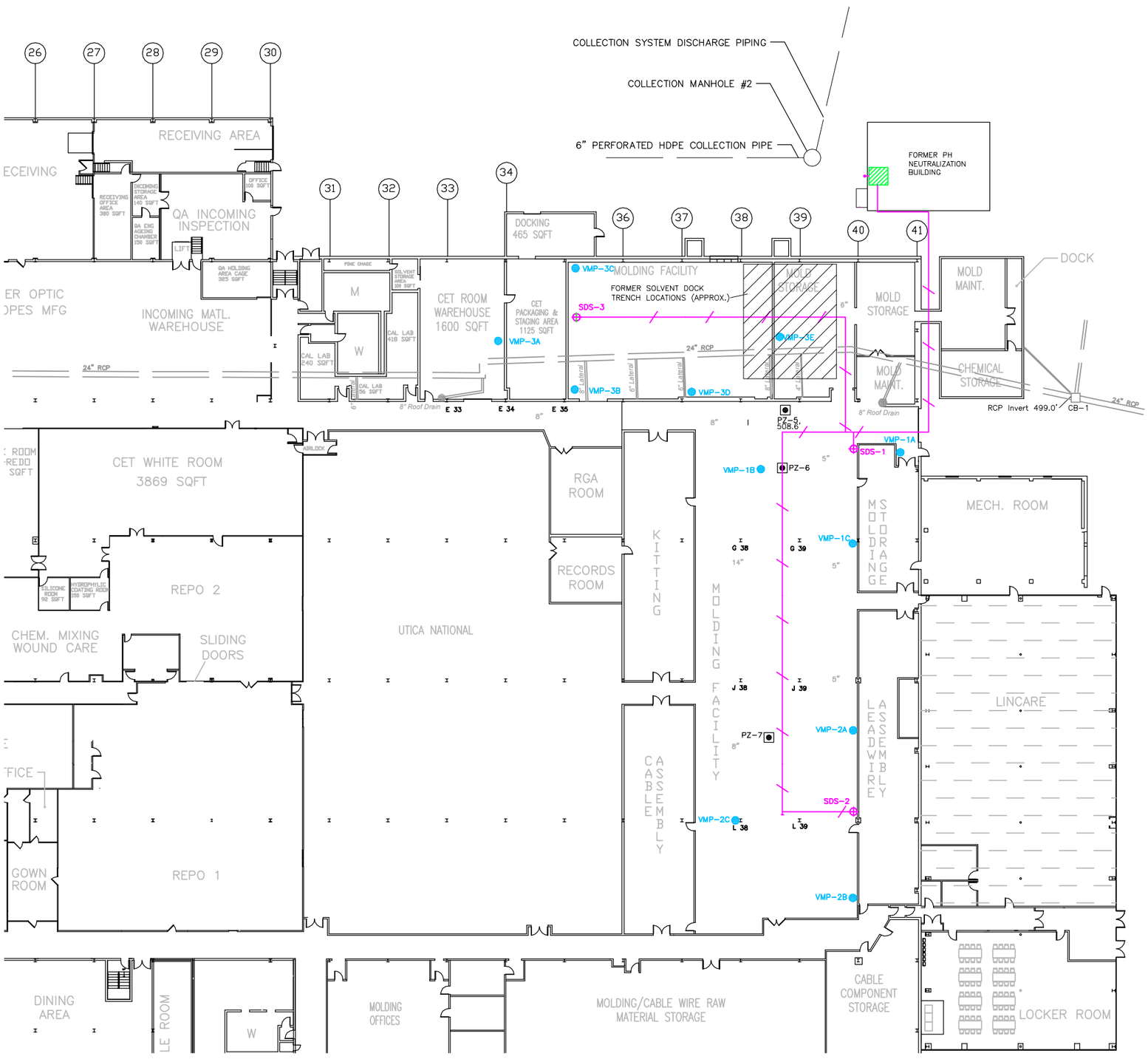
FIGURE
1

SITE MANAGEMENT PLAN
FORMER LOCKHEED MARTIN
FRENCH ROAD FACILITY
UTICA, NEW YORK

FACILITY MAP

ARCADIS

FIGURE
2



LEGEND

- PZ-7 — LOCATION OF EXISTING PIEZOMETER
- SDS-1 — LOCATION OF SUBSLAB DEPRESSURIZATION SUMP (SDS)
- VMP-1A — LOCATION OF TEMPORARY VACUUM MONITORING POINT (VMP)
- LOCATION OF SUBSLAB DEPRESSURIZATION SYSTEM EQUIPMENT
- LOCATION OF SUBSLAB DEPRESSURIZATION ABOVE GRADE PIPING
- 5" — SLAB THICKNESS BASED ON RECORD DRAWINGS PROVIDED BY CONMED CORPORATION
- (35) — BUILDING COLUMN LINE IDENTIFICATION
- 24" RCP — ACTIVE FACILITY STORM SEWER

PLANT NORTH

NOTES:

1.BASE DRAWING SOURCE: CONMED, TITLE: FRENCH ROAD BLOCK PLAN PROPOSED SPACE UTILIZATION, DRAWING NO:FR001, DATE: 01/28/94. CONMED SOURCE DRAWING: LOCKHEED MARTIN DRAWING NUMBER RFABLK.DWG JEG 310CT94.

0 40 80
SCALE IN FEET

LOCKHEED MARTIN CORPORATION
Utica, New York
SITE MANAGEMENT PLAN

VAPOR MONITORING POINT LOCATION MAP

ARCADIS

FIGURE 3

CITY:(ALB) DIV/GROUP:(ENV/SER1) DB:(T.CARIGNAN) LD:(T.CARIGNAN) PIC:(L.MCBURNEY) PM:(C.MOTTA) TM:(J.BONSTEEL)
G:\APROJECT\LOCKHEED\Utica\Vapor Intrusion - Solvent Dock\Revised WP for the ICM\Figures
PROJECT: N.J000631.0001.00001
XREFS:

CHAINLINK FENCE

2 STORY MASONRY BOILER HOUSE

FIRE TANK

TANK BUILDING

EDGE OF ASPHALT

1 STORY MASONRY MAINTENANCE BUILDING

1 STORY METAL STORAGE BUILDING

CB-3

MH-7A

MH-1

GROUND WATER TREATMENT BUILDING

1 STORY BRICK GUARD HOUSE

ASPHALT (POOR CONDITION)

1 STORY WOOD FRAME

1 STORY RAISED METAL BUILDING

PZ-02

PZ-04

MW 9

MW-4

MW-5

MW 13S

MW 13T

MW 13BR

MW 10

MW 2

MW 3

MW 1

MH-2

WASTEWATER TREATMENT BUILDING

EDGE OF GRAVEL

HAZARDOUR WASTE STORAGE BUILDING

MW 8

CONCRETE CURB

PZ-8

PZ-5

PZ-6

PZ-12

PZ-11

CB-1

MW 11

PZ-16

PZ-15

PZ-14

PZ-13

CB-2

2 STORY MASONRY CON MED FACILITY

PZ-9

PZ-7

PZ-10

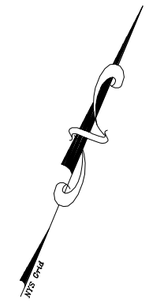
MW 7

MW 14S

MW-14BR

MW-15BR

MW 15S



0 40 80 120

SCALE IN FEET

LEGEND:

- MW 10 — MONITORING WELL LOCATION
- PZ-9 — PIEZOMETER LOCATION
- QUARTERLY MONITORING
- SEMI ANNUAL MONITORING
- ANNUAL MONITORING

NOTES:

1. LABORATORY ANALYSIS TO BE TCL EPA 624/SW846 8260.
2. GROUNDWATER ELEVATIONS TO BE COLLECTED QUARTERLY FROM ALL SITE WELLS.

SITE MANAGEMENT PLAN
FORMER LOCKHEED MARTIN
FRENCH ROAD FACILITY
UTICA, NEW YORK

MONITORING WELL NETWORK

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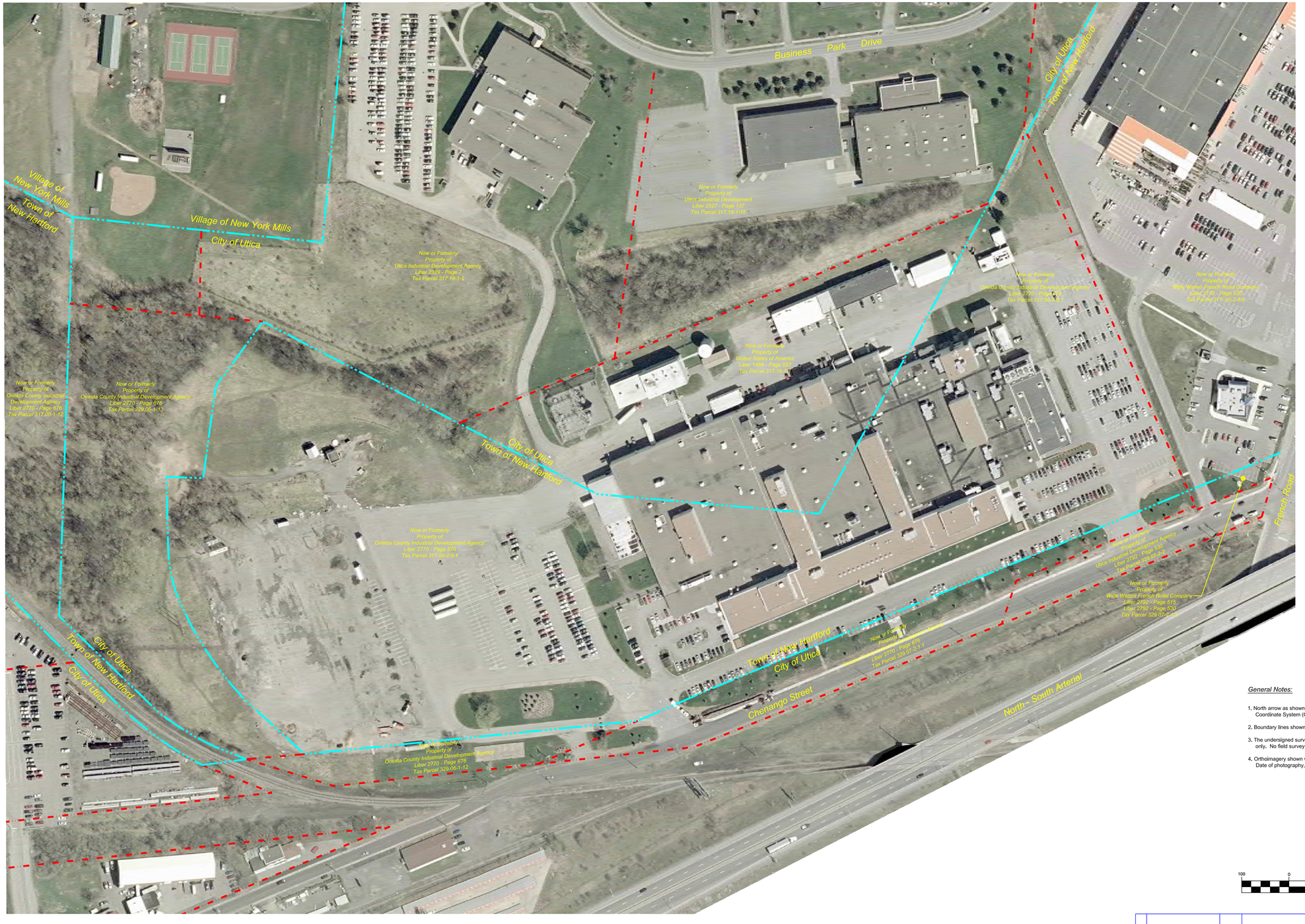
FIGURE
4

ARCADIS

Appendix A

Property Survey Map

NYS GRID



Legend:

- City / Town Line
- Adjoiner Tax Parcel Line
- ***Liber 2770 - Page 676*** Deed Book and Page

General Notes:

1. North arrow as shown is referenced to the North American Datum of 1983 (NAD83) and projected on the New York State Plane Coordinate System (Central Zone).
2. Boundary lines shown hereon were taken from tax maps on file with the Oneida County Real Property Office.
3. The undersigned surveyor does not certify to the accuracy of the boundary lines shown. Boundary lines shown are for reference only. No field survey was conducted to verify property line locations.
4. Orthoimagery shown was taken from the New York State Department of Transportation GIS internet web site. Date of photography, 2003.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

REV	DESCRIPTION	DATE
1	Update Tax Parcel 329.06-1-13 Information	4/22/09

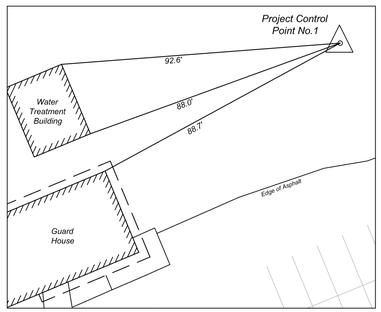
PROJECT NUMBER: UK156-10-07

DRAWN: M.J.B.
CHECKED: R.H.K.
SCALE: 1" = 100'
DATE: 11/30/07

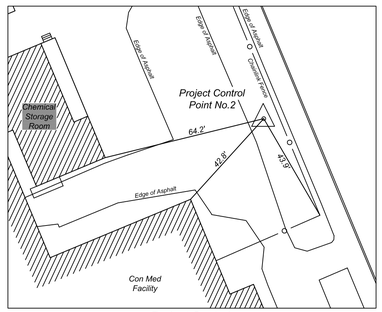
Tax Map Overlay
Former Lockheed Martin Facility

City of Utica and Town of New Hartford
County of Onieda
State of New York

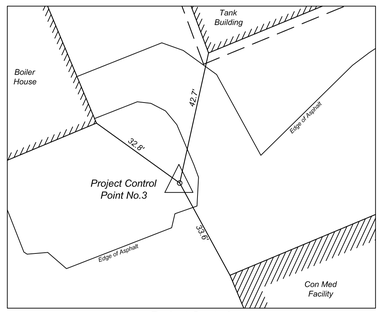
Thew Associates PE-LS, PLLC
Land Surveyors - GPS Consultants
www.ThewAssociates.com
Principals
James S. Thew, PLS
Spencer F. Thew, PE-LS
301 St. Anthony Street Utica, New York 13501
T: 315/733-7278
F: 315/797-1957



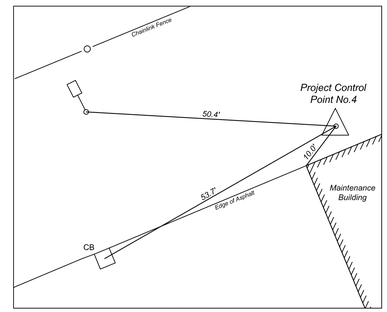
Project Control
Point No. 1 Swing Tie
Not to Scale



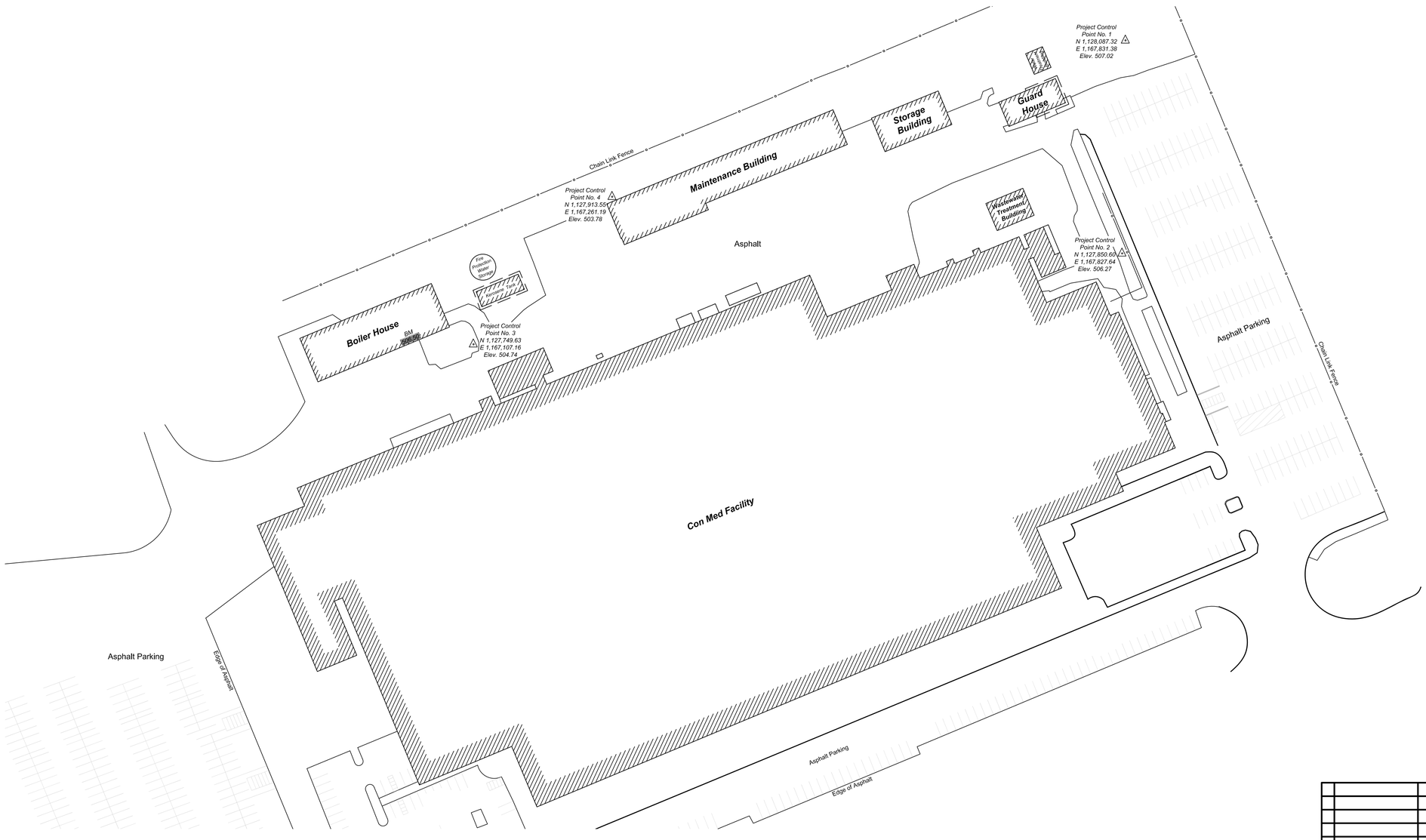
Project Control
Point No. 2 Swing Tie
Not to Scale



Project Control
Point No.3 Swing Tie
Not to Scale



Project Control
Point No. 4 Swing Tie
Not to Scale



Legend:

——o——	Chain Link Fence
506.50	Finished Floor Elevation and Location
△	Project Control Point

General Notes:

1. This survey is referenced horizontally to the North American Datum of 1983 (NAD83) and projected on the New York State Plane Coordinate System (Central Zone).
2. North arrow as shown indicates Grid North referenced to NAD83 and projected on the New York State Plane Coordinate System (Central Zone).
3. The reference horizontal control station is a GPS Continuously Operating Reference Stations (CORS) designated as "Rome CORS ARP" (NYRM). NYRM is a Special horizontal Control Station established by National Geodetic Survey in July 1997.
4. The reference benchmark is the finished floor of the southeasterly corner of the Boiler House building as designated on Reference Drawing No. 1, sheet G1. Elevation 506.50 feet. The vertical datum of Reference Drawing No. 1 is unknown.
5. The information shown hereon is based on an instrument survey completed on November 29, 2007.

Benchmarks:

Control Point No. 1
Set 5/8 inch rebar with a 1-1/4 inch diameter orange plastic cap marked "Thew Baseline" set flush, approximately 88 feet easterly of the southeasterly corner of the Water Treatment Building and approximately 89 feet easterly of the northeasterly corner of the Guard House. Elevation 507.02 feet.

Control Point No. 2
Set 5/8 inch rebar with a 1-1/4 inch diameter orange plastic cap labeled "Thew Baseline" set flush, approximately 64 feet easterly of the southeasterly corner of the Chemical Storage Room and approximately 44 feet northerly of the southeasterly fence corner. Elevation 506.27 feet.

Control Point No. 3
Set 5/8 inch rebar with a 1-1/4 inch diameter orange plastic cap labeled "Thew Baseline" set flush, approximately 33 feet southerly of the southeasterly corner of the Boiler Room and approximately 43' southerly of the southwesterly corner of the Tank Building. Elevation 504.74 feet.

Control Point No. 4
Set 5/8 inch rebar with a 1-1/4 inch diameter orange plastic cap labeled "Thew Baseline" set flush, approximately 10 feet northeasterly of the northwesterly corner of the Maintenance Building and approximately 54' northeasterly from a catch basin. Elevation 503.78 feet.

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

Sheet 1 of 8

REV	DESCRIPTION	DATE

PROJECT NUMBER: UK156-10-07

DRAWN: N.D.G.
CHECKED: R.H.K.
SCALE: 1" = 60'
DATE: 11/30/07

Project Control
Former Lockheed Martin Facility

City of Utica and Town of New Hartford
County of Onieda
State of New York

Thew Associates PE-LS, PLLC
Land Surveyors - GPS Consultants
www.ThewAssociates.com
Principals
James B. Thew, PLS
Spencer F. Thew, PE-LS
301 St. Anthony Street Utica, New York 13501
T: 315/723-7278
F: 315/797-1907

N:\PROJECTS\2007\UK156\DWG\UK156-Project Control.dwg 11/30/2007 3:11:52 PM EST

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Appendix B

Groundwater Collection and Treatment System Operation, Maintenance, and Monitoring Manual

(UNDER SEPARATE COVER)

ARCADIS

Appendix C

Monitored Natural Attenuation Plan

(UNDER SEPARATE COVER)

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Appendix D

Sub-Slab Depressurization System Operation, Maintenance, and Monitoring Plan

(UNDER SEPARATE COVER)

ARCADIS

Appendix E

Site Information

1. Site Summary

In the early 1950s, General Electric Company (GE) acquired approximately 55 acres of undeveloped land on French Road in Utica, New York and constructed a 500,000-square-foot manufacturing facility. The facility is located on the border of the Utica and the town of New Hartford. GE operations included manufacturing, assembly, and testing of electrical components for the defense and aerospace industries. GE operations continued until April 1993, when the facility was acquired by Martin Marietta Corporation (MMC). In March 1995, MMC merged with Lockheed Corporation to form Lockheed Martin Corporation. In March 1996, Lockheed Martin sold the property to Pinnacle Park, Inc., which subsequently transferred the property to and leased it back from Oneida County Industrial Development Agency (OCIDA). ConMed Corporation (ConMed), a medical supplies manufacturer and distributor, now occupies the facility under a lease with OCIDA. Lockheed Martin retains responsibility for environmental cleanup activities related to past releases at the Solvent Dock Area even though it no longer owns the property.

Groundwater in the northeast portion of the main manufacturing building, in an area known as the Solvent Dock and an area along the northern-perimeter ditch, has been adversely affected by volatile organic compounds (VOCs). The former Solvent Dock and immediate vicinity (referred to as the Solvent Dock Area) included a 275-gallon fiberglass overflow-retention tank. This tank was used to store spent waste solvents, which were periodically sampled, pumped from the tank, and disposed of by waste haulers. The tank was removed in June 1990, and was observed to be dented and leaking fluid. The northern-perimeter ditch (along the northern property boundary) was an open drainage swale that received stormwater from the area north of the manufacturing building and conveyed the water, along with stormwater from the western portion of the property, to a manhole before eventual discharge to the municipal storm-sewer.

Since 1991, GE, MMC, and Lockheed Martin have completed groundwater investigations in these areas. In November 1994, Blasland, Bouck, & Lee, Inc. (BBL) completed an investigation of the facility storm-sewer in the Solvent Dock Area. The investigation determined that VOCs detected in the storm sewer were attributable to the discharge of VOC-contaminated groundwater into the northern perimeter ditch and infiltration of VOC-contaminated groundwater from the Solvent Dock Area into the storm sewer beneath the building.

In May 1995, BBL completed a *Storm Sewer Investigation Report*, which recommended that the contaminated portion of the storm-sewer flow be collected, treated, and discharged to meet proposed State Pollutant Discharge Elimination System (SPDES) VOC-effluent limitations. BBL evaluated remedial design alternatives to address the source of VOCs entering the storm sewer that would remediate the contaminated groundwater (in accordance with NYSDEC recommendations). The results of this evaluation were presented in the *Storm Sewer Basis of Design Report* (BBL 1995d).

Based on this report, BBL completed the final design of the French Road facility GCTS in October 1995. Construction of the system was completed in June 1996. The system collects groundwater from the Solvent Dock Area and the northern-perimeter ditch area, conveys the collected groundwater to a treatment building where VOCs are removed by a low-profile air stripper, and then discharges the treated effluent to the municipal stormwater system. A hydraulic and chemical groundwater-monitoring program was developed to evaluate the effectiveness of the GCTS for the Solvent Dock Area. This program, as presented in the *Ground-Water Sampling and Analysis Work Plan* (BBL 1998b), has been modified through monthly and

quarterly correspondence with NYSDEC to accommodate the changing conditions over the life of the project.

In response to observed groundwater contamination at the Site (as described above), Lockheed Martin voluntarily installed and operated the GCTS and initiated an investigation of soil-vapor and indoor-air quality. Lockheed Martin and NYSDEC began developing an Order on Consent for the Site in 2007, which became effective on October 3, 2008. The Order identifies five AOC and requires further investigation and identification of corrective actions for each area. These investigations were completed in 2008, and the results are presented in the *CMS Report*. Supplemental investigations to the CMS are ongoing.

1.1 Geologic and Hydrogeologic Conditions

Site geology, as fully described in the *CMS Report*, consists of the following units:

- Fill (approximately 5–10 feet (ft.) thick) and naturally occurring undifferentiated overburden consisting of silt, sand, and gravel (maximum thickness of 20 ft.)
- Till consisting of dense gray-brown silty clay with fine sand and gravel (approximately 20–40 ft. thick), and
- The top of bedrock (Utica Shale), encountered at depths ranging from approximately 30 ft. below ground-surface (bgs) to 52 ft. bgs. The deepest Site boring was advanced to a total depth of 68.5 ft. bgs, where the Utica Shale was still present

The till surface is observed at higher elevations beneath the building footprint as compared to elevations outside the building footprint. Till surface deepens in a radial pattern away from the building to the north, east, and south. This may be an artifact of excavation and/or removal of the shallow till at locations around the perimeter of the building during construction and utility installation (in the 1950s). The bedrock surface dips gently to the south.

1.2 Groundwater Occurrence

Groundwater occurs in the overburden and bedrock. Groundwater in the fill and undifferentiated overburden is unconfined, and occurs at a depth of approximately 2–11 ft. bgs. Water-elevation data and stratigraphic information indicate that groundwater in the till is also unconfined. Groundwater occurs in bedrock under semi-confined conditions. The dense till overlying the bedrock acts as a leaky confining layer. Groundwater exhibits a downward gradient at the Site (based on water levels collected as part of the CMS investigation). This indicates that the till provides strong resistance to vertical flow, and that little water moves through the till into bedrock.

1.3 Water-Elevation Data

Water-elevation data for the fill, undifferentiated overburden, and till show a complex array of water levels. Groundwater flows to the south in both the overburden and bedrock. Operation of the GCTS has controlled groundwater movement near the former Solvent Dock and modified the direction of groundwater flow to the northeast. Groundwater-elevation and groundwater-quality data suggest the potential for flow along the storm-sewer line (beneath the facility footprint and headed east toward the catch basins outside the main

facility, as shown in Figure 2) in a generally eastward direction, although a permeable backfill-material was not identified during GCTS-evaluation activities. However, the potential remains for groundwater to infiltrate the storm-sewer line beneath the eastern portion of the building.

2. Current Site occupant, and the party implementing the SMP for the Site

The current Site occupant is:

ConMed Corporation
525 French Road
Utica, New York 13502-5994
(phone) 315-797-8375
(fax) 315-797-0321

The location of the Site is at:
525 French Road
Utica, New York 13502-5994

3. Current status of the Site remedial activity

The New York State Department of Environmental Conservation (NYSDEC) has issued an "Order on Consent" (the Order) (CO 6-20080321-5) (October 3, 2008) for the Site. The Site is being remediated in accordance with the Order. NYSDEC has yet to issue the "Statement of Basis" for the Site. Corrective measures at the Site have yet to be been completed.

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Appendix F

Groundwater Sampling Log

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Water Sampling Log

Project _____ Project No. _____ Page _____

Site Location _____ Date _____

Site/Well No. _____ Replicate No. _____

Weather _____ Sampling Time: Begin _____ End _____

Evacuation Data

Measuring Point _____

Sounded Well Depth (ft bmp) _____

Depth to Water (ft bmp) _____

MP Elevation (ft) _____

Land Surface Elevation (ft) _____

Water-Level Elevation (ft) _____

Casing Diameter _____

Gallons Pumped/Bailed Prior to Sampling _____

Sample Pump Intake Setting (ft bmp) _____

Packer Pressure (psi) _____

Pumping Rate (gpm) _____

Evacuation Method _____

Sampling Method _____

Purge Time Begin _____ End _____

Field Parameters

Color _____

Odor _____

Appearance _____

	I	1V	2V	3V
pH (s.u.)				
Conductivity (mS/cm)				
(µmhos/cm)				
Temperature (°C)				
DO (mg/L)				
Turbidity (NTU)				
ORP				
Volume				

Remarks: _____

Constituents Sampled: _____ Sampling Personnel: _____

Well Casing Volumes

Gal./Ft.				
	$1^{1/4}$" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	$1^{1/2}$" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	mS/cm	Milisiemens per centimeter	VOC	Volatile Organic Compounds
°C	Degrees Celsius	s.u.	Standard units	umhos/cm	Micromhos per centimeter
ft	feet	NTU	Nephelometric Turbidity Units		
gpm	Gallons per minute	N/A	Not Applicable		
mg/L	Miligrams per liter	COC	Chain of Custody		

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Appendix G

Draft Monitoring-Well
Decommissioning Policy

DRAFT Monitoring Well Decommissioning Policy

New York State Department of Environmental Conservation

Date Issued:	Latest Date Revised:

I. Summary:

Monitoring wells provide an essential access to the subsurface so that scientific and engineering investigations can be made. Any monitoring well is an environmental liability to some degree because it has the potential to act as a conduit for pollution to reach the groundwater. To lessen this liability, when the effective life of a monitoring well has been reached, it must be properly decommissioned. This document provides guidance for satisfactorily decommissioning monitoring wells in New York State. Topics include how to choose the most appropriate well decommissioning method and how to implement that method in the field.

II. Policy:

It is the policy of the New York State Department of Environmental Conservation (Department) that environmental monitoring wells be properly decommissioned when they are no longer needed or when their integrity is suspect or compromised. The choice of decommissioning method shall be appropriate for the situation and will be determined based upon well construction and environmental parameters. The selected method shall be designed to protect our groundwater and shall be implemented according to current best engineering practices and shall follow all applicable federal, state and local regulations.

III. Purpose and background:

Other synonyms for well decommissioning include “plugging,” “capping” and “abandoning.” For consistency only the term “decommissioning” is used in remainder of this document.

Unprotected, neglected and improperly abandoned monitoring wells are a serious environmental liability. They can function as a pollution conduit for surface contaminants to reach the subsurface and pollute our groundwater. They also can cause unwanted mixing of groundwaters which degrade the overall water quality within the aquifer. Improperly constructed, poorly maintained or damaged monitoring wells can yield anomalous poor data which in turn can compromise the findings of an environmental investigation or remediation project. Unneeded monitoring wells must be physically removed or plugged in order to prevent harm to our groundwater.

Since 1980 the Department has installed, directed or overseen the installation of thousands of monitoring wells across the state in various state and federal programs including programs for Superfund, solid waste, Resource Conservation and Recovery Act (RCRA), spill response, petroleum bulk storage and chemical bulk storage. This guidance addresses the environmental liability associated with this aging network of wells.

Within its boring zone, a successfully decommissioned well prevents the following:

1. migration of existing or future contaminants into an aquifer or between aquifers;

2. migration of existing or future contaminants within the vadose zone;

3. the potential for vertical or horizontal migration of fluids in the well or adjacent to the well; and

4. any change in aquifer yield and hydrostatic head unless due to natural conditions.

Monitoring well construction in New York State varies considerably due to the age of the well, the local geology and the presence or absence of contamination. No single decommissioning method is recommended for all situations in New York State.

IV. Responsibility:

The Division of Environmental Remediation (DER) is responsible updating this policy. Compliance with the guidance does not relieve any party of the obligation to successfully and satisfactorily decommission a monitoring well. Enforcement and oversight responsibility will be carried out by each Department Regional Engineer.

V. Procedure:

The following information pertains to the procedures for monitoring well decommissioning. Sections of the guidance are arranged by topic in the following order:

1. Preparation
2. Selecting the appropriate well decommissioning method and a discussion of pertinent techniques
3. Locating and setting up on the well
4. Removing the protective casing
5. Selecting, mixing, and placing grout
6. Backfilling and site restoration
7. Documentation
8. Field oversight

1.0 PREPARATION

The first step in the well decommissioning process is to review all pertinent site information. This includes boring and well logs, field inspection sheets, and laboratory analytical results performed on the site's soil and groundwater samples. This site information will form the basis for decisions throughout the decommissioning process.

Field inspection of the wells prior to decommissioning is also recommended to verify the characteristics and conditions of the wells. Special conditions such as access problems, well extensions through capped and covered landfills, and cap conditions due to seasonal weather patterns should be assessed. At well locations where the riser has been extended, the burial of a previous concrete pad may

require the excavation of soil to the top of the concrete pad to remove the well. Decommissioning work requiring the use of heavy vehicular equipment on RCRA landfill caps should be scheduled during dry weather if possible so as to minimize damage to the cover. If work must be performed during the spring, winter or inclement weather, special measures such as placement of plywood to reduce ruts should be employed to maintain the integrity of the completed landfill cover system. A sample "Monitoring Well Field Inspection Log," which indicates the minimum information to be collected during field verification activities, is included as Figure 2.

2.0 SELECTING THE WELL DECOMMISSIONING METHOD

The primary rationale for well decommissioning is to prevent contaminant migration along the disturbed construction zone created by the original well boring. This requires selection of a decommissioning procedure that takes into account factors such as:

1. hydrogeological conditions at the well site;
2. presence or absence of contamination in the groundwater; and
3. original well construction details.

The proper well decommissioning methods and selection process are presented on the flow chart presented as Figure 1. For each decommissioning method, the specific procedures are determined by (1) geology; (2) contaminants; and (3) well design. For example, decommissioning a well that penetrates a confining layer may require a different approach than decommissioning an unconfined water table well. This section presents a summary of the well decommissioning methods and the selection process. The four primary well decommissioning methods are:

1. casing pulling;
2. overdrilling;
3. grouting the casing in-place; and
4. perforating the casing followed by grouting in-place.

A general discussion of each decommissioning method is presented in Sections 2.1 through 2.5. A form to be used in the field to record the decommissioning construction is included as Figure 3. When either casing pulling or overdrilling are required, due to the uncertainty of successfully pulling a well or overboring a well, we strongly recommend that the driller tremie grout the well first. Then without allowing the grout to dry, the driller proceeds with pulling the casing or overdrilling the well. Refer to Figure 1 for the complete method selection process.

2.1 CASING PULLING

In general, referring to Figure 1, casing pulling is the preferred method for decommissioning wells where: no contamination is present; contamination is present but the well does not penetrate a confining layer; and when both contamination and a confining layer are present but the contamination cannot cross the confining layer. Additionally, the well construction materials and well depth must be such that pulling can be effected without breaking the riser. The majority of “gas station wells,” ie. shallow, petroleum spill monitoring wells, can be grouted as they are pulled. These are the simplest wells to remove but the removal and sealing still needs to be complete!

Most monitoring wells are finished with a protective casing (guard pipe) and a cement rain pad. The riser will usually be bonded to the guard pipe and rain pad. When the protective casing and cement

pad are "yanked out," a polyvinyl chloride (PVC) riser will typically break off at the bottom of the guard pipe several feet below grade. Once this happens, it may become impossible to center a drill rig upon the well. The riser may become splintered and structurally unstable for pulling. The well may fill with dirt. Before pulling a casing or overdrilling a well, a method must be devised for removing these pieces without jeopardizing the remaining decommissioning effort.

Casing pulling involves removing the well casing by lifting. The procedure for removing the casing must allow grout to be added during pulling. The grout will fill the space once occupied by the material being withdrawn. Grout mixing and placement must be performed according to the procedures in Section 5.0.

An acceptable procedure to remove casing involves puncturing the bottom of the well or using a casing cutter to cut away the screen, filling the casing with grout tremied from the bottom of the well, using jacks to free casing from the hole, and lifting the casing out by using a drill rig, backhoe, crane, or other suitable equipment. Additional grout must be added to the casing as it is withdrawn. In wells or well points in which the bottom cannot be punctured, the casing or screened interval will be perforated or cut away prior to being filled with grout. This procedure should be followed for wells installed in collapsible formations or for highly contaminated wells. In situations where well materials such as PVC screens and risers are expected to sever, and removal of all well materials is required (i.e., at wells where it is suspected that inadequate construction procedures have resulted in poor annular seals or the formation was allowed to collapse on the casing along a portion of it’s length, overdrilling will be required. Overdrilling is discussed in Section 2.4.

At sites in which well casings have been grouted into a rock socket, the casing pulling procedure may not be feasible. Grouting casings in-place is the preferred method of abandonment where the removal of the casing may be problematic, and the annulus of the well has been documented to be properly sealed.

2.2 GROUTING IN-PLACE

Grouting in-place is the simplest decommissioning procedure, but if improperly applied, offers the least long-term protection of all the methods. As discussed in Section 2.5, however, this method is preferred for the bedrock portion of bedrock wells, and is used for decommissioning cased wells in certain situations. For cased wells, the procedure involves filling the casing with grout to a level of five feet below the land surface, cutting the well casing at the five-foot depth, and removing the top portion of the casing and associated well materials from the ground. The casing must be grouted according to the procedures in Section 5.0. In addition, the upper five feet of the borehole is filled to land surface and restored according to the procedures described in Section 6.0.

For wells installed in bedrock, the procedure involves filling the casing (or open hole) with grout to the top of rock according to the procedures in Section 5.0. The grout mix, however, will vary according to the hydrogeological conditions as discussed in Section 2.5.

It should be noted that for wells located on landfills regulated under 6NYCRR Part 360, the screened interval of the well must be sealed separately and hydrostatically tested to ensure its adequacy before sealing the remaining borehole. The Standard Operating Procedure (SOP) for the hydrostatic test has been included under Appendix A.

2.3 CASING PERFORATION/GROUTING IN-PLACE

At this time, casing perforation is the preferred method for wells with four-inch or larger inside diameter which are designated to be grouted in-place in accordance with the selection flow chart, and the well's annulus is suspected of being improperly backfilled. Perforating the casing and screen allows plugging material to come in contact with the annular space and formation. The procedure involves perforating the well casing and screen then grouting the well. A wide variety of commercial equipment is available for perforating casings and screens in wells with four-inch or larger inside diameters. Due to the diversity of application, experienced contractors must recommend a specific technique based on site-specific conditions. A minimum of four rows of perforations several inches long and a minimum of five perforations per linear foot of casing or screen is recommended (American Society for Testing and Materials, Standard D 5299-99, 1999).

After perforating is complete, the borehole must be grouted according to the procedures in Section 5.0 and the upper five feet of borehole must be restored according to the procedures in Section 6.0.

2.4 OVERDRILLING

Because of it's complicated nature, difficulty and uncertain outcome, overdrilling is the least preferred abandonment option. Overdrilling is used where casing pulling is determined to be unfeasible, or where installation of a temporary casing is necessary to prevent cross-contamination, such as when a confining layer is present and contamination in the deeper aquifer could migrate to the upper aquifer as the well was pulled (see Section 2.5). The overdrilling method should:

1. follow the original well bore;
2. create a borehole of the same or greater diameter than the original boring;
3. remove all of the well construction materials.

Acceptable methods for overdrilling include the following. Please note that these methods are not suitable for all types of casing, and the advice of an experienced driller should be sought:

1. Using conventional augering (i.e., a hollow stem auger fitted with a pilot bit). The pilot bit will grind the well construction materials, which will be brought to the well surface by the auger.

2. Using a conventional cable tool rig to advance casing having a larger diameter than the original boring. The cable tool kit is advanced within the casing to grind the well construction materials and soils, which are periodically removed with large diameter bailer. This method is not applicable to bedrock wells.

3. Using an over-reaming tool with a pilot bit nearly the same size as the inside diameter of the casing and a reaming bit slightly larger than the original borehole diameter.

4. Using a hollow-stem auger with outward facing carbide cutting teeth having a diameter two to four inches larger than the casing. Outward-facing cutting teeth will prevent severing the casing and drifting off center.

Prior to overdrilling, the bottom of the well should be perforated or cut away, and the casing

filled with grout as with the casing removal method.

In all cases above, overdrilling should advance beyond the original bore depth by a distance of 0.5 feet to ensure complete removal of the construction materials. Oversight attention should be focused on the drill cuttings, looking for fragments of well materials. Absence of these indicators is a sign that the augers have wandered off the well. When the overdrilling is complete, the casing and screen can be retrieved from the center of the auger (American Society for Testing and Materials, Standard D 5299-99, 1999), if one of the hollow stem auger methods described above is employed. Subsequent to overdrilling at flush mount well locations where it may be impractical to remove well materials from inside the augers, a 1-2 foot deep area should be excavated by hand around the flush-mount well to facilitate a conventional well removal while tremie-grouting inside the well. Alternatively, the soil within the annular space may be removed by raising the augers to allow the soil to fall out and re-advance the augers to the original target depth. Grout should then be tremied within the annular space between the augers and well casings. The grout level in the borehole should be maintained as the drilling equipment and well materials are sequentially removed. After overdrilling is completed, the borehole must be grouted according to the procedures in Section 5.0 and the upper five feet of borehole must be restored according to the procedures in Section 6.0.

2.5 SELECTION PROCESS AND IMPLEMENTATION

The decommissioning procedure selection flow chart, Figure 1, presents the logic behind selecting a particular decommissioning method. A discussion of the selection criteria and decommissioning methodology is presented below.

2.5.1 Contaminated Monitoring Wells/Piezometers

For wells and piezometers suspected or known to be contaminated with non-aqueous phase liquid (NAPL) and/or dense non-aqueous phase liquid (DNAPL) both also referred to as “product,” the decision to decommission the well should be reviewed. If decommissioning is determined to be the proper course of action, measurement of the product volume will be determined and the product will be removed. Subsequent to product recovery, all contaminated materials will be disposed of in accordance with appropriate regulations for solid waste and hazardous waste.

2.5.2 Bedrock Wells

Referring to Figure 1, if the well is constructed within a bedrock formation, the screened or the open hole portion of the well is grouted to the top of the bedrock. Prior to grouting, the depth of the well will be measured to determine if any silt or debris has plugged the well. If plugging has occurred, all reasonable attempts to clear it should be made before grouting. The borehole will then be tremie grouted from the bottom of the well to the top of bedrock to ensure a continuous grout column. Note that if the bedrock well is cased, the screen should be perforated to the top of the rock if the inside diameter of the casing is 4-inches or larger. Furthermore, if the screened interval transects multiple water bearing zones the special grout mix discussed in Section 5.1.2 should be used to ensure penetration of the sand pack.

After the rock hole is grouted, the overburden portion of the well is decommissioned in accordance with the rest of Section 2.0. If the bedrock extends to the ground surface, grouting can extend to the ground surface or to slightly below so that the site can be restored as appropriate in accordance with Section 6.0.

2.5.3 Uncontaminated Overburden Wells

For overburden wells and the overburden portion of bedrock wells, the first decision point in determining the decommissioning method considers whether the overburden portion of the well exhibits evidence of contamination, as determined through historical groundwater and/or soil sampling results. If the overburden portion of the well is uncontaminated, the next criteria considers whether the well penetrates a confining layer. In the case that the overburden portion of the well does not penetrate a confining layer, the casing should be tremie-grouted and pulled. As a general rule, PVC wells greater than 25-feet deep should not be pulled unless site-specific conditions or other factors indicate that the well can be pulled without breaking. If the well cannot be pulled, such as in the case that a bedrock portion of the well has already been grouted in-place, or if the well materials and depth prohibit pulling or will likely result in breakage, the well should be grouted in-place as accordance with Section 2.2 (if the casing is less than 4-inch in diameter) or Section 2.3 (if the casing diameter is 4-inches or larger).

If the overburden portion of the well penetrates a confining layer, the casing should be removed by pulling (if possible) in accordance with Section 2.1. If the casing cannot be removed by pulling, the well should be grouted in-place if appropriate or removed by overdrilling. The overdrilling method used will depend on the site-specific conditions and requirements. If pulling is attempted and fails (i.e., a portion of the riser breaks) the remaining portion of the well should be removed by using the conventional augering procedure identified in Section 24. Note that if the riser is broken during pulling, it is highly unlikely that the driller will be able to target it to overdrill it. In all cases, after the well construction materials have been removed to the extent possible, the borehole will be grouted in accordance with Section 5.0 and the upper five feet will be restored in accordance with Section 6.0.

2.5.4 Contaminated Overburden Wells

If an overburden well or the overburden portion of a bedrock well is contaminated as evidenced by historical sampling results, the first decision point in selecting a decommissioning procedure is whether the well penetrates a confining layer. If the well does not penetrate a confining layer, the selection process follows the same pathway as for uncontaminated wells that penetrate a confining layer (i.e., the casing is pulled, if possible; otherwise the well is grouted in-place or overdrilled - see Sections 2.1– 2.3).

For overburden wells that are contaminated and which penetrate a confining layer, the next selection criteria is whether the well riser is a single stem or is telescoped inside one or more outer casings.

2.5.4.1 Single Stem Riser

If the riser is a single stem, the potential for contamination across confining layers must be addressed. In this event, well construction details are critical to the decision process. If construction details are well documented, and formation collapse has not been permitted as annular backfill, it may be best to grout in-place. In cases of poor documentation or shoddy construction practices, it will be necessary to install an outer casing having a diameter larger than the original borehole into the top of the confining layer. This casing should be permanently set in-place with it's annulus properly sealed and grouted. If the confining layer is less than 5 feet thick, the casing should be installed to the top of the confining layer. Otherwise, it is installed to a depth of 2 feet below the top of the confining layer. After the outer casing has been set, the well can be removed and grouted through pulling (if possible) or grouted in-place. After well is grouted, the upper 5 feet of the well surface should then be restored in

accordance with Section 6.0.

2.5.4.2 Telescoped Riser

If the riser is telescoped in one or more outer casings, the decommissioning approach is dependent on the integrity of the well seal. For the purpose of the monitoring well decommissioning procedures, the well seal is defined as the bentonite seal above the sand pack. Although it is not possible to visually inspect or otherwise test the well seal to assess its condition, an indication of the well seal integrity may be obtained through review of the boring logs and/or a comparison of groundwater elevations if the well is part of a cluster. Any problems noted on the boring logs pertaining to the well seal, such as bridging of bentonite pellets or running sands, or disparities between field notes (if available) and the well log would indicate the potential for a poor well seal. Alternatively, if the well is part of a cluster, a comparison of groundwater elevations between the shallow and deep wells should also be performed. By observing trends at other clusters, it may be possible to identify inconsistencies in groundwater elevations at the well slated for decommissioning, thereby indicating a poor well seal.

If there is no evidence that the well seal integrity is compromised, the riser should be grouted in-place in accordance with Section 2.2 or 2.3, depending on the diameter of the well casing, and the upper 5 feet of the well surface should be restored in accordance with Section 6.0. If indications are that the well seal is not competent, it will be necessary to design and implement a special procedure to remove the well construction materials, as the presence and configuration of the outer casing(s) will be specific in the individual wells and will be a key factor in the decommissioning approach. The special procedure should be designed to mitigate the potential for cross-contamination during removal of the well construction materials, and should be designed prior to initiating field work.

3.0 LOCATING AND SETTING-UP ON THE WELL

Typically the following tasks will be performed to locate the well to be decommissioned.

1. Notify the property owner and/or other interested parties including the governing regulatory agency prior to site mobilization whenever possible.

2. Review all information about the well contained in the site file. This information may include one or more of the following: the site map, well boring log, well construction diagram, field inspection log, well photograph, and proposed well decommissioning procedure.

3. Verify the well location and identification by locating the identifying marker.

4. Verify the depth of the well in the well construction log by sounding with a weighted tape.

After the well has been located, the decommissioning procedure should be selected in accordance with Section 2.0 based on the available boring and sampling data. If a drill rig is used, it must be set up prior to initiating drilling to ensure proper alignment with the well (i.e., the drill string must be aligned with the monitoring well).

4.0 REMOVING THE PROTECTIVE CASING

4.1 GENERAL

Removing the protective casing of a well must not interfere with or compromise the integrity of decommissioning activities performed at the well.

The procedure for removing the protective casing of a well depends upon the decommissioning method used. When the decommissioning procedure requires casing perforation or grouting in-place, the outer protective casing should be removed after grout is added to the well. When a well is decommissioned by the casing pulling method, the protective casing should be removed before the well casing is removed to prevent untimely breakage of the well casing. The protective casing handling and disposal must be consistent with the methods used for the well materials, unless an alternate disposal method can be employed (i.e., steam cleaning followed by disposal as non-hazardous waste).

4.2 WELL HEAD PREPARATION PRIOR TO DECOMMISSIONING

When overdrilling, the protective casing must be removed first, unless the drilling tools have an outside diameter larger than the protective casing. The variety of protective casings available preclude developing a specific removal procedure. In all instances, however, the specific procedure used must minimize the risk of:

1. breaking the well casing off below ground; and
2. allowing foreign material to enter the well casing.

An acceptable protective casing removal method involves breaking up the concrete seal surrounding the casing and jacking or hoisting the protective casing out of the ground. A check should be made during pulling to ensure that the inner well casing is not being hoisted with the protective casing. If this occurs, the well casing should be cut off after the base of the protective casing is lifted above the land surface.

4.3 AFTER SEALING THE WELL

If the decommissioning method used allows well casing to remain in the ground, the protective casing should be removed after the well has been properly filled with grout. This will ensure that the well is properly sealed regardless of problems with protective casing removal. Upon completion of grouting in-place, the well casing should be removed approximately five feet below the land surface so as to be below the frost line and out of the way of any subsequent shallow digging. The upper 5 feet of casing and the protective casing can be removed in one operation if a casing cutter is used. If the height of the protective casing makes working conditions at the well awkward, the casing can be cut off at a lower level.

5.0 SELECTING, MIXING, AND PLACING GROUT

5.1 SELECTING GROUT MIXTURE

There are two types of grout mixes that may be used to seal wells: a standard mix and a special mix. Both mixes use Type 1 Portland cement and four percent bentonite by weight. However, the special mix uses a smaller volume of water and is used in situations where excessive loss of the standard

grout mix is possible (e.g., highly-fractured bedrock or coarse gravels).

5.1.1 Standard Grout Mixture

For most boreholes, the following standard mixture will be used:

1. one 94-pound bag Type I Portland cement;
2. 3.9 pounds powdered bentonite; and
3. 7.8 gallons potable water.

This mixture results in a grout with a bentonite content of four percent by weight and will be used in all cases except in boreholes where excessive use of grout is anticipated. In these cases a special mixture will be used (see Section 5.1.2).

See Section 5.2 for grout mixing procedures.

5.1.2 Special Mixture

In cases where excessive use of grout is anticipated, such as high permeability formations and highly fractured or cavernous bedrock formations, the following special mixture will be used:

1. one 94-pound bag type I Portland cement;
2. 3.9 pounds powdered bentonite;
3. 1 pound calcium chloride; and
4. 6.0-7.8 gallons potable water (depending on desired thickness).

The special mixture results in a grout with a bentonite content of four percent by weight. It is thicker than the standard mixture because it contains less water. This grout is expected to set faster than the Standard Grout Mixture. The least amount of water that can be added for the mixture to be readily pumpable is 6 gallons per 94-pound bag of cement.

See Section 5.2 for grout mixing procedures.

5.2 GROUT MIXING PROCEDURE

To begin the grout-mixing procedure, calculate the volume of grout required to fill the borehole. If possible, the mixing basin should be large enough to hold all of the grout necessary for the borehole.

Mix grout until a smooth, homogeneous mixture is achieved. Grout can be mixed manually or with a mechanized mixer. Colloidal mixers should not be used as they tend to excessively decrease the thickness of the grout for the above recipes.

5.3 GROUT PLACEMENT

Grout will be placed in the borehole from the bottom to the top using a tremie pipe of not less than 1-inch diameter. Grout will then be pumped into the borehole until the grout appears at the land surface (when grouting open holes in bedrock, the grout level only needs to reach above the bedrock

surface). Any groundwater displaced during grout placement will be pumped via suction lift to a 55-gallon drum for proper disposal.

At this time the rate of settling should be observed. When the grout level stabilizes, casing or augers will be removed from the hole. As each section is removed, grout will be added to keep the level between 0 and 5 feet below grade. If the grout level drops below the land surface to an excessive degree, an alternate grouting method must be used. One possibility is to grout in stages; i.e., the first batch of grout is allowed to partially cure before a second batch of grout is added.

Upon completion of grouting, ensure that the final grout level is approximately five feet below land surface. A ferrous metal marker will be embedded in the top of the grout to indicate the location of the former monitoring well. A metal detector may not be able to detect a deeply buried marker so if this locator is important for future utility runs or foundations, a map should be submitted to the property owner and the town engineer showing the decommissioned well locations. Global Positioning System (GPS) coordinates should be indicated on this map. Lastly, a fabric "utility" marking should be placed one foot above the grout so an excavator can see it clearly.

6.0 BACKFILLING AND SITE RESTORATION

The uppermost 5 feet of the borehole at the land surface will be filled with a material appropriate to the intended use of the land. The materials will be physically similar to the natural soils. No materials will be used that limit the use of the property in any way. The surface of the borehole will be restored to the condition of the area surrounding the borehole. For example, concrete or asphalt will be patched with concrete or asphalt of the same type and thickness, grassed areas will be seeded, and topsoil will be used in other areas. All solid waste materials generated during the decommissioning process must be disposed of properly.

7.0 DOCUMENTATION

It is common practice for the Department to contract with an engineering firm (the Engineer) to accomplish monitoring well decommissioning. As may be required by the NYSDEC project manager, the Engineer's on-site construction inspector will document monitoring well decommissioning activities. Completed field inspection logs, Figures 1 and 2, may be required by the Department project manager. Other backup documentation will include, at a minimum, daily reports of construction activities, photographs, and sketches as necessary. Daily report forms to be completed by the construction inspector are presented in Appendix B.

The Engineer will maintain complete and detailed records associated with all construction and related activities during the duration of the project. These records will be maintained at the Engineer's office(s) and will include, but not be limited to, the following:

1. daily work completed and important conversations;

2. contractor's daily use of personnel, material and equipment;

3. records documenting the contractor's deviation from work as specified in the contract documents, and any instructions issued regarding deviations;

4. unusual circumstances (i.e., weather conditions, labor disputes, environmental problems, health and safety hazards encountered, etc.);

5. general files including correspondence and other documentation related to the project;

6. job meeting minutes with documentation on resolution of issues raised;

7. records of contractor's submittals including shop drawings, modifications/change orders, soil tests, material tests and action taken (i.e., owner approval/disapproval, further information needed);

8. construction photos;

9. telephone conversations;

10. as-built diagrams of the boreholes as they have been left after decommissioning; and

11. maps locating the decommissioned boreholes in relation to permanent land marks.

Documentation on the condition of the removed wells with respect to the impacts of hazardous waste, minerals and other pertinent environmental factors, or which is otherwise discernable through direct observation, will be presented along with any recommendations for future well installation techniques and materials.

8.0 FIELD OVERSIGHT

The successful implementation of a decommissioning work plan depends upon proper direction and oversight. Methods to be employed must be clearly worked through and all parties must understand what they have to do before going into the field. Flexibility is allowed where necessary but the work effort must be thorough and effective; the basic goal of monitoring well decommissioning is the protection of our groundwater.

VI. Related References:

Adaska, Wayne. Personal Communication, A.S.T.M. Grouting Subcommittee. 1993.

Aller, Linda, and others. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells. National Ground Water Association, Dublin, Ohio. 1989.

American Society for Testing and Materials, A.S.T.M. D 5299-99, Standard Guide for the Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities. A.S.T.M.. Philadelphia. 1999.

American Water Works Association. Abandonment of Test Holes, Partially Completed Wells, and Completed Wells. 1984.

Angevine, Mary. Personal Communication, Marcor of New York, Inc. 1993.

Blas, Stanley. Personal Communication, SJB Services, Inc. 1993.

Edil, Tuncer B. and others. Sealing Characteristics of Selected Grouts for Water Wells. GROUNDWATER, Vol. 30, No.3. 1992.

Ellingsworth, Michael. Personal Communication, Parratt-Wolff, Inc. 1993.

Gaber, M.S., and Fisher, B., Michigan Water Well Grouting Manual. Michigan Department of Public Health, Lansing, MI. 1988.

Groundwater Monitoring Well Decommissioning Procedures, October 1986. Prepared by Malcolm Pirnie, Inc., for the New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation.

Hansen, M. Personal Communication, Chem-Grout, Inc., 1993.

Johnson Division of UOP, Inc., Ground Water and Wells. Johnson Division of UOP, Inc., Saint Paul, Minnesota. 1975.

Malcolm Pirnie, Inc., Decommissioning Procedures. Prepared for New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation. April 1993.

Malcolm Pirnie, Inc., Recommended Field Practices/Guidelines. Unpublished, 1990.

Morgan, Robert. Personal Communication, A.S.T.M. Soil Committee D-18. 1993.

New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation, Final Division Technical and Administrative Guidance Memorandum - Disposal of Drill Cuttings 1989.

New York State Department of Environmental Conservation, Division of Solid Waste, 6 NYCRR Part 360 Solid Waste Management Facilities, 1988

New York State Department of Environmental Conservation, Division of Solid and Hazardous Waste, Guidelines for Exploratory Boring, Monitoring Well Installation, and Documentation of These Activities, undated.

New York State Department of Environmental Conservation, Region I - Water Unit, Specifications for Abandoning Wells and Boreholes in Unconsolidated Materials, undated.

Thew, Jeffrey. Personal Communication, North Star Drilling Co. 1993.

U.S. Department of the Interior. Ground Water Manual, United States Government Printing Office, Washington D.C. 1977.

United States Environmental Protection Agency, Manual of Water Well Construction Practices, EPA 570/9-75-001.

United States Environmental Protection Agency, The Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells, EPA 600/4-89/034.

Walker, Brian. Personal Communication, Global Drilling Suppliers, Inc. 1992.

FIGURES:

APPENDICES:

FIGURE 1

DECOMMISSIONING PROCEDURE SELECTION

Decommissioning Procedure Selection

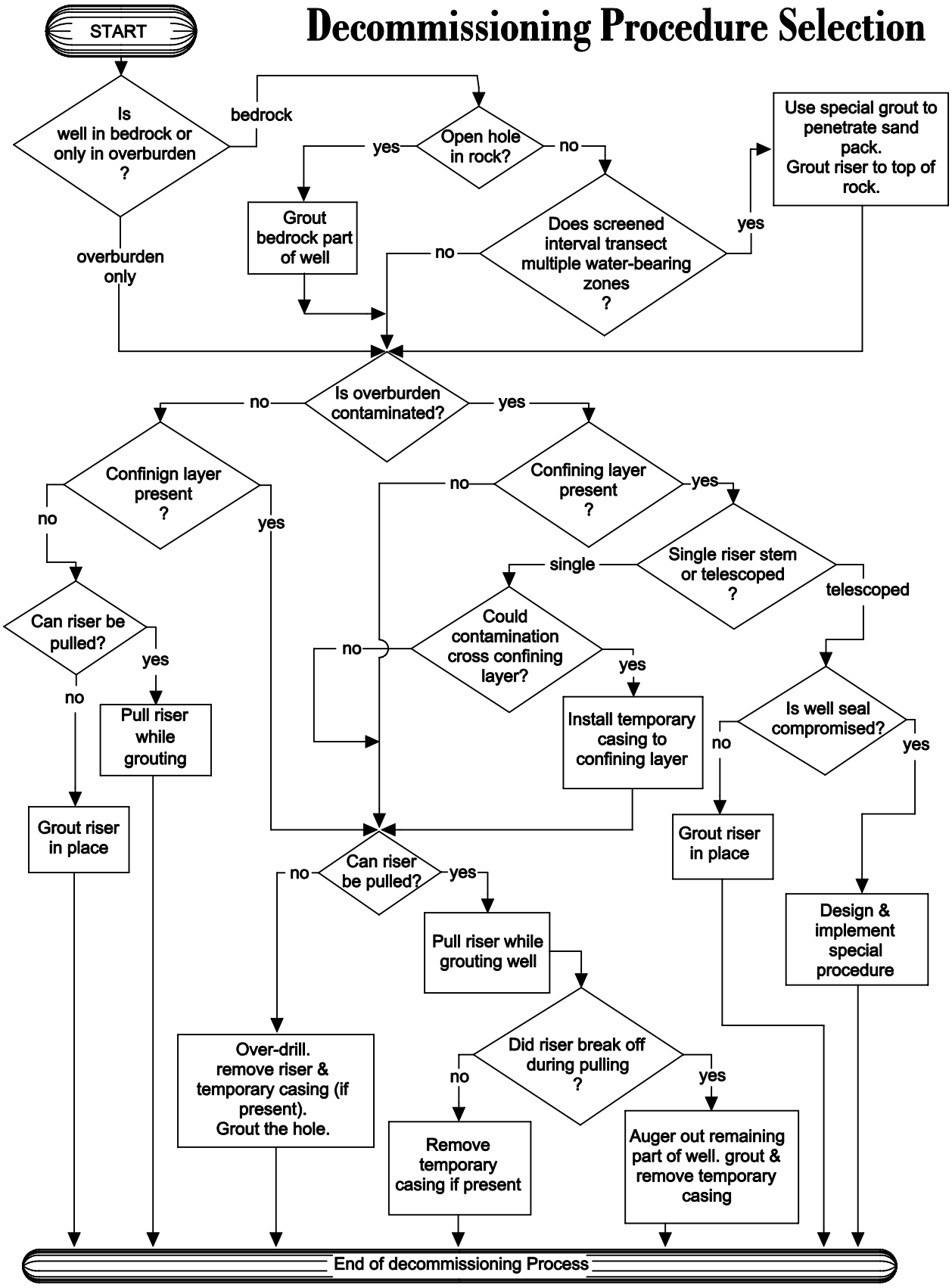


FIGURE 1

FIGURE 2

MONITORING WELL FIELD INSPECTION LOG

SITE NAME: _____ SITE ID.: _____

INSPECTOR: _____

MONITORING WELL FIELD INSPECTION LOG

DATE/TIME: _____

WELL ID.: _____

	YES	NO
WELL VISIBLE? (If not, provide directions below)		
WELL I.D. VISIBLE?		
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back).....		

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: .....

	YES	NO
SURFACE SEAL PRESENT?		
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)		
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)		

HEADSPACE READING (ppm) AND INSTRUMENT USED..... _____

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable) _____

PROTECTIVE CASING MATERIAL TYPE: ..... _____

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): .....

	YES	NO
LOCK PRESENT?		
LOCK FUNCTIONAL?		
DID YOU REPLACE THE LOCK?		
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		
WELL MEASURING POINT VISIBLE?		

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): ..... _____

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): ..... _____

MEASURE WELL DIAMETER (Inches): ..... _____

WELL CASING MATERIAL: ..... _____

PHYSICAL CONDITION OF VISIBLE WELL CASING: ..... _____

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE ..... _____

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES..... _____

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

REMARKS:

FIGURE 3

WELL DECOMMISSIONING RECORD

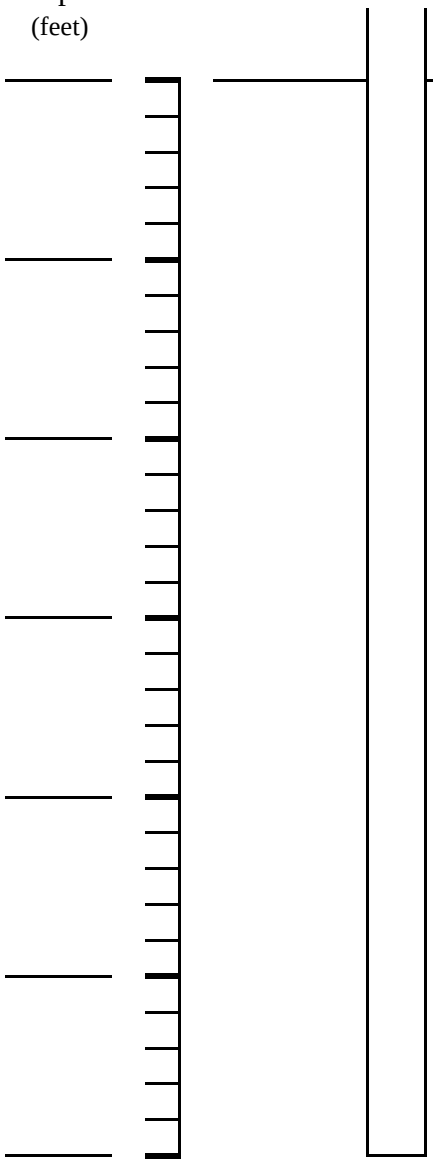
WELL DECOMMISSIONING RECORD

Site Name:	Well I.D.:
Site Location:	Driller:
Drilling Co.:	Inspector:
	Date:

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	
Casing retrieved (feet)	
Casing type/dia. (in)	
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	
# of batches prepared	
For each batch record:	
Quantity of water used (gal.)	
Quantity of cement used (lbs.)	
Cement type	
Quantity of bentonite used (lbs.)	
Quantity of calcium chloride used (lbs.)	
Volume of grout prepared (gal.)	
Volume of grout used (gal.)	

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

APPENDIX A

HYDRAULIC PRESSURE TESTING OF SCREENED INTERVAL

Appendix A

HYDRAULIC PRESSURE TESTING OF SCREENED INTERVAL

1.0 INTRODUCTION

This guideline presents a method for evaluating the integrity of a grout seal in the screened interval of a well being decommissioned by grouting in place.

2.0 METHODOLOGY

1. Grout the screened interval of the well using a tremie pipe, up to a level of one to two feet above the screened section.

2. Allow the grout to set for a period of not less than 24 hours and not greater than 72 hours before pressure testing of the grouted interval is begun.

3. Place a pneumatic packer at a maximum of four and one half feet above the top of the screened section of the well casing.

4. Apply an inflation pressure to the packer, not exceeding the pressure rating of the well casing material. If the interval between the top of the grout and the bottom of the packer is not saturated, use potable water to fill the interval.

5. Apply a gauge pressure of 5 psig at the well head to the interval for a period of 5 minutes to allow for temperature stabilization. After 5 minutes maintain the pressure at 5 psig for 30 minutes.

6. The grout seal shall be considered acceptable if the total loss of water to the seal does not exceed 0.5 gallons over a 30-minute period.

7. If the grout seal is determined to be unacceptable, an additional 5 feet of grout will ve added to the well casing with a tremie pipe. The interval will be retested as described above.

APPENDIX B - REPORTS:

INSPECTOR'S DAILY REPORT
PROBLEM IDENTIFICATION REPORT
CORRECTIVE MEASURES REPORT

Inspector's Daily Report

CONTRACTOR:
ADDRESS:

TELEPHONE:
LOCATION _____ FROM _____ TO _____
WEATHER _____ TEMP _____ A.M. _____ P.M. _____ DATE _____

CONTRACTOR'S WORK FORCE AND EQUIPMENT											
DESCRIPTION	*H*	*#*	*DESCRIPTION*	*H*	*#*	*DESCRIPTION*	*H*	*#*	*DESCRIPTION*	*H*	*#*
Field Engineer						Equipment			Front Loader Ton		
Superintendent			Ironworker			Generators			Bulldozer		
						Welding Equip.					
Laborer Foreman			Carpenter								
Laborer									Backhoe		
Operating Engineer			Concrete Finisher								
Carpenter						Paving Equip. & Roller					
						Air compressor					

SEE REVERSE SIDE FOR SKETCH YES ☐ NO ☐ _____

WORK PERFORMED: _____

PAY ITEMS

CONTRACT		STA		DESCRIPTION	QUANTITY	REMARKS
Number	ITEM	FROM	TO			

TEST PERFORMED: _____
PICTURES TAKEN: _____

VISITORS: _____

QA PERSONNEL
SIGNATURE _____

REPORT NUMBER _____
SHEET _____ Of _____

MEETINGS HELD AND RESULTS

REMARKS

REFERENCES TO OTHER FORMS

SKETCHES

SAMPLE LOG

SAMPLE NUMBER

APPROXIMATE LOCATION OF STOCKPILE

NUMBER OF STOCKPILE

DATE OF COLLECTION

CLIMATIC CONDITIONS

FIELD OBSERVATION

SHEETS OF

PROBLEM IDENTIFICATION REPORT

Date _____

Project _____ Job Number _____

Day | Su | M | T | W | Th | F | Sa |

Contractor _____

Subject _____

Sky/Precip.	Clear	Partly Cloudy	Cloudy	Rainy	Snow
TEMP.	<32F	32-40F	40-70F	70-80F	80-90F
WIND	No	Light	Strong		
HUMIDITY	Dry	Mod.	Humid		

PROBLEM DESCRIPTION Reference Daily Report Number 1: _____

PROBLEM LOCATION - REFERENCE TEST RESULTS AND LOCATION (Note: Use sketches on back of form as appropriate):

PROBABLE CAUSES: _____

SUGGESTED CORRECTIVE MEASURES: _____

APPROVALS:

QA ENGINEER: _____

PROJECT MANAGER: _____

Distribution:
1. Project Manager
2. Field Office
3. File
4. Owner

QA Personnel
Signature: _____

CORRECTIVE MEASURES REPORT

Date _____

Project _____ Job Number _____

Day | Su | M | T | W | Th | F | Sa |

Contractor _____

Subject _____

Sky/Precip.	Clear	Partly Cloudy	Cloudy	Rainy	Snow
TEMP.	<32F	32-40F	40-70F	70-80F	80-90F
WIND	No	Light	Strong		
HUMIDITY	Dry	Mod.	Humid		

CORRECTIVE MEASURES TAKEN (Reference Problem Identification Report No.): _____

RETESTING LOCATION: _____

SUGGESTED METHOD OF MINIMIZING RE-OCCURRENCE: _____

SUGGESTED CORRECTIVE MEASURES: _____

APPROVALS:

QA ENGINEER: _____

PROJECT MANAGER: _____

Distribution:

1. Project Manager
2. Field Office
3. File
4. Owner

QA Personnel
Signature: _____

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Appendix H

Soil-Vapor Sampling Log

Soil Gas Sample Collection Log

Sample ID:

Client:		**Date/Day:**	
Project:		**Weather:**	
Location:		**Temperature:**	
Project #:		**Wind Speed/Direction:**	
Samplers:		**Subcontractor:**	
Logged By:		**Equipment:**	
Background PID Ambient Air Reading:		**Moisture Content of Sampling Zone (circle one):**	Dry / Moist
Sampling Depth:		**Approximate Volume of Sampling Train:**	
Time of Collection:	Start: Stop:	**Approximate Purge Volume:**	

Nearby Groundwater Monitoring Wells/Water Levels:

Well ID	Depth to Groundwater (feet)

SUMMA Canister Information

Size (circle one): **1 L** **6 L**

Canister ID: _____

Flow Controller ID: _____

Tracer Gas Information (if applicable)

Tracer Gas and Source of Tracer Gas: _____

Canister Pressure (inches Hg):		
Reported By Laboratory	**Gauge Reading Prior to Sample Collection**	**Gauge Reading Following Sample Collection**

Measured in Purge Effluent	Measured in 'Concentrated' Area Prior to Sample Collection	Measured in 'Concentrated' Area Following Sample Collection	Measured in Sampling Train after Sampling

General Observations/Notes:

Approximating Sampling Train Volume (for purging):
When using 1¼-inch "Dummy Point" and a 6-inch sampling interval, the sampling space will have a volume of approximately 150 mL.
Each foot of ¼-inch tubing will have a volume of approximately 10 mL.

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Appendix I

Site Inspection Form

ENCLOSURE 1
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
INSTITUTIONAL AND ENGINEERING CONTROLS CERTIFICATION FORM

SITE DETAILS

SITE NO. X-XX-XXX

SITE NAME

SITE ADDRESS: ZIP CODE: XXXXX

CITY/TOWN:

COUNTY:

CURRENT USE:

CURRENT CERTIFICATION FREQUENCY: EVERY ___ YEAR(S)

VERIFICATION OF SITE DETAILS

		YES	NO
1.	Are the SITE DETAILS above, correct?	☐	☐
	If NO, are changes handwritten above or included on a separate sheet?	☐	
2.	Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment since the initial/last certification?	☐	☐
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	☐	
3.	Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property since the initial/last certification?	☐	☐
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	☐	
4.	Has a change-of-use occurred since the initial/last certification?	☐	☐
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	☐	
5.	Has any new information come to your attention to indicate that assumptions made in the qualitative exposure assessment for offsite contamination are no longer valid (applies to non-significant threat sites subject to ECL 27-1415.7(c))?	☐	☐
	If YES, is the new information or evidence that new information has been previously submitted included with this certification?	☐	
6.	Are the assumptions in the qualitative exposure assessment still valid (must be certified every five years for non-significant threat sites subject to ECL 27-1415.7(c))?	☐	☐
	If NO, are changes in the assessment included with this certification?	☐	

SITE NO. X-XX-XXX

Description of Institutional/Engineering Control	Control Certification	
	YES	NO
ENVIRONMENTAL EASEMENT	☐	☐
Type in Restriction here	☐	☐

CONTROL CERTIFICATION STATEMENT

For each institutional or engineering control listed above, I certify by checking "Yes" that all of the following statements are true:

(a) the institutional control and/or engineering control employed at this site is unchanged from the date the control was put in-place, or last approved by the Department;

(b) nothing has occurred that would impair the ability of such control to protect public health and the environment;

(c) nothing has occurred that would constitute a violation or failure to comply with any Site Management Plan for this control; and

(d) access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control.

(e) if a financial assurance mechanism is required under the remedial work plan for the site, the mechanism remains valid and sufficient for their intended purpose under the work plan.

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I _____(print name), _____

(print business address), am certifying as _____ (Owner or Owner's Designated Site Representative (if the site consists of multiple properties, I have been authorized and designated by all site owners to sign this certification) for the Site named in the Site Details section of this form.

_____ _____
Signature of Site Owner or Representative Rendering Certification Date

QUALIFIED ENVIRONMENTAL PROFESSIONAL (QEP) SIGNATURE

I certify that all information and statements in this Certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I _____(print name), _____

(print business address), am certifying as a Qualified Environmental Professional for the_____

_____ (Owner or Owner's Representative) for the Site named in the Site Details section of this form.

_____ _____ _____
Signature of Qualified Environmental Professional, for the Owner or the Owner's Representative, Rendering Certification Stamp (if Required) Date

Enclosure 2

Certification of Institutional Controls/ Engineering Controls (ICs/ECs) Step-by-Step Instructions, Certification Requirements and Definitions

The Site owner, or site owner's representative, and when necessary, a Professional Engineer (P.E.), or the Qualified Environmental Professional (QEP), must review and complete the IC/EC Certification Form, sign it, and return it, along with the Periodic Site Management Report, within 45 days of the date of this notice.

Institutional Controls (defined below) are organized into 4 categories: Governmental Controls (e.g., groundwater-use restrictions), Proprietary Controls (e.g., Environmental Easements), Enforcement and Permit Tools (e.g., Consent Orders), and Informational Devices (e.g., State Registries of Inactive Hazardous Waste Sites). The Certification Form shows the Control information the Department has for this Site. Please use the following instructions to complete the IC/EC Certification.

I. Verification of Site Details (First and Second Boxes):

1. Verify the accuracy of information in the **Site Details** section by answering the 6 questions. If necessary, you and/or your P.E. or QEP may handwrite changes and submit supporting documentation.

II. Verification of Institutional / Engineering Controls (Third and Fourth Boxes)

1. Review the listed Institutional / Engineering Controls and select "YES" or "NO" for **Control Certification** for each IC/EC, based on Sections (a)-(d) of the **Control Certification Statement**.

2. If you cannot certify "Yes" for each Control, please continue to complete the remainder of this **Control Certification** form. Attach supporting documentation that explains why the **Control Certification** cannot be rendered, as well as a statement of proposed corrective measures, and an associated schedule for completing the corrective measures. Note that this **Control Certification** form must be submitted even if an IC or EC cannot be certified; however, the certification process will not be considered complete until corrective action is conducted.

   If the Department concurs with the explanation, the corrective measures, and the proposed schedule, a letter authorizing the implementation of those corrective measures will be issued. If the Department has any questions or concerns regarding the completion of the certification, the Project Manager will contact you.

III. Certification by Signature (Fifth and Sixth Boxes):

1. WHY IC/EC Certification is required:
   The Section of the New York Environmental Conservation Law that includes the requirement of a periodic certification of IC(s) and EC(s) is as follows:

   For Environmental Restoration Projects: N.Y. Envtl Conserv.Law Section 56-0503 (Environmental restoration projects; state assistance)

   For State Superfund Projects: Envtl Conserv.Law Section 27-1318. (Institutional and engineering controls)

   For Brownfields Cleanup Program Projects: Envtl Conserv.Law Section 27-1415. (Remedial program requirements)

   Voluntary Cleanup Program: Applicable program guidance.

2. To determine WHO signs the **Control Certification,** please use the following table:

Signature Requirements for IC/EC Certification Form		
Type of Control	**Example of IC/EC**	**Required Signatures**
IC	Environmental Easement Deed Restriction.	Site Owner or their designated representative, e.g., a Property Manager.
EC with no treatment system, or engineered caps.	Fence, Clean Soil Cover.	Site Owner or their designated representative, and QEP. (P.E. license not required)
EC that includes treatment systems, or engineered caps.	Pump & Treat System providing hydraulic control of a plume, Part 360 Cap.	Site Owner or his designated representative, and QEP with P.E. License.

3. WHERE to mail the signed Certification Form within 45 days of the date of the notice:

New York State Department of Environmental Conservation
Division of Environmental Remediation
address
City, New York zipcode
Attn: xxxx xxxxx, Project Manager

Please note that extra postage may be required.

IV. Definitions:

"Engineering Control" (EC), means any physical barrier or method employed to actively or passively contain, stabilize, or monitor any hazardous waste or petroleum waste to ensure the long-term effectiveness of an inactive site remedial program or brownfield site remedial program or environmental restoration project, or to eliminate potential exposure pathways to any such hazardous waste or petroleum waste. Engineering Controls include, but are not limited to: pavement, caps, covers, subsurface barriers and slurry walls; building ventilation systems; fences, other barriers and access controls; and provision of alternative water supplies via connection to an existing public water supply, addition of treatment technologies to an existing public water supply, and installation of filtration devices on an existing private water supply.

"Institutional Control" (IC), means any non-physical means of enforcing a restriction on the use of real property, that limits human or environmental exposure to any hazardous waste or petroleum waste, 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 an inactive site remedial program or brownfield site remedial program or environmental restoration project, or with the effectiveness and/or integrity of Site Management activities at or pertaining to any site.

"Professional Engineer" means a person, including a firm headed by such a person, who holds a current New York State Professional Engineering license or registration, and has the equivalent of three (3) years of full-time relevant experience in site investigation and remediation of the type detailed in this Control Certification.

"Property Owner" means, for purposes of an IC/EC certification, the actual owner of a property. If the site has multiple properties with different owners, the Department requires that the owners be represented by a single representative to sign the certification.

"Oversight Document" means any document the Department issues pursuant to each Remedial Program (see below) to define the role of a person participating in the investigation and/or remediation of a site or area(s) of concern. Examples for the various programs are as follows:

BCP (after approval of the BCP application by DEC) - Brownfield Site Cleanup Agreement.
ERP (after approval of the ERP application by DEC) - State Assistance Contract.
Federal Superfund Sites - Federal Consent Decrees, Administrative Orders on Consent or Unilateral Orders issued pursuant to CERCLA.
Oil Spill Program - Order on Consent, or Stipulation pursuant to Article 12 of the Navigation Law (and the New York Environmental Conservation Law).
State Superfund Program - Administrative Consent Order.
VCP (after approval of the VCP application by DEC) - Voluntary Cleanup Agreement.
RCRA Corrective Action Sites- Federal Consent Decrees, Administrative Orders on Consent or permit conditions issued pursuant to RCRA.

"Qualified Environmental Professional" (QEP), means a person, including a firm headed by such a person, who possesses sufficient specific education, training, and experience necessary to

exercise professional judgment, to develop opinions and conclusions regarding the presence of releases or threatened releases to the surface or subsurface of a property or off-site areas, sufficient to meet the objectives and performance factors for the areas of practice identified by this guidance (DER10 Technical Guide).

1. Such a person must:
   i. Hold a current Professional Engineering or a Professional Geologist license or registration, and have the equivalent of three (3) years of full-time relevant experience in site investigation and remediation of the type detailed in this guidance; or
   ii. Be a site remediation professional licensed or certified by the federal government, a state; or a recognized, accrediting agency, to perform investigation or remediation tasks identified by this guidance, and have the equivalent of three (3) years of full-time relevant experience. Examples of such license or certification include, but are not limited to, the following titles:
      - Licensed Site Professional, by the State of Massachusetts
      - Licensed Environmental Professional, by the State of Connecticut
      - Qualified Environmental Professional, by the Institute of Professional Environmental Practice
      - Certified Hazardous Materials Manager, by the Institute of Hazardous Materials Management

2. The definition of QEP provided above does not preempt State Professional licensing or registration requirements such as those for a Professional Geologist, Engineer, or Site Remediation Professional. Before commencing work, a person should determine the applicability of State professional licensing or registration laws to the activities to be undertaken pursuant to section 1.5 (DER10 Technical Guide).

3. A person who does not meet the above definition of a QEP under the foregoing definition may assist in the conduct of all appropriate investigation or remediation activities in accordance with this document if such person is under the supervision or responsible charge of a person meeting the definition provided above.

"Remedial Party" means any person or persons, as defined in 6NYCRR 375, who executes, or is otherwise subject to, an oversight document (State Superfund, BCP, ERP or VCP Program). For purposes of this guidance, remedial party also includes:

1. Any person or persons who is performing the investigation and/or remediation, or has control over the person (for example, contractor or consultant) who is performing the investigation and/or remediation, including, without limitation, an owner, operator or volunteer; and

2. The DER for State-funded investigation and/or remediation activities.

"Site Management" (SM) means the activities included in the last phase of the remediation of a site, in accordance with a Site Management Plan, which continue until the remedial action objectives for the project are met and the site can be closed-out. Site Management includes the

management of the institutional and engineering controls required for a site, as well as the implementation of any necessary long-term monitoring and/or operation and maintenance of the remedy. (Formerly referred to as Operation and Maintenance (O&M)).

"Site Management Plan" (SMP) means a document which details the steps necessary to assure that the institutional and engineering controls required for a site are in-place, and any physical components of the remedy are operated, maintained and monitored to assure their continued effectiveness, developed pursuant to Section 6 (DER10 Technical Guide).

"Site Owner" means the actual owner of a site. If the site has multiple owners of multiple properties with ICs and/or ECs, the Department requires that the owners designate a single representative for IC/EC Certification activities.

"Site Owner's Designated Representative" means a person, including a firm headed by such a person, who has been designated in writing by the Site Owner(s) to complete and sign the Institutional and Engineering Controls Certification Form.

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Appendix J

Emergency Contact List

FORMER LOCKHEED MARTIN CORPORATION FACILITY
SITE MANAGEMENT PLAN
PROJECT CONTACT LIST

Site Contact

Lockheed Martin Corporation
Mr. Tom Blackman
Lockheed Martin Corporate Shared Services
6801 Rockledge Drive MP:CLE-610
Bethesda, MD 20817
Phone: (301) 214-9958
tom.d.blackman@lmco.com

NYSDEC

Mr. Larry Rosenmann
NYSDEC Division of Solid & Hazardous Materials
625 Broadway, Albany, NY 12233-7258
Phone: (518) 402-8594
Fax: (518) 402-9024
larosenm@gw.dec.state.ny.us

NYSDOH

Mr. Greg Rys
NYS Department of Health
5665 NYS Route 5
Herkimer, NY 13350
Phone: (315) 866-6879
gar02@health.state.ny.us

ConMed Corporation (Site Occupant)

Mr. Paul Ragusa
Plant Engineering Manager
525 French Road
Utica, NY 13502-5994
Phone: (315) 624-3018
Paul_Ragusa@mail.conmed.com

O&M Contractor

ARCADIS of New York, Inc.
465 New Karner Road, First Floor
Albany, NY 12205
Phone: (518) 452-7826