Interim Source Removal Summary Groundwater Extraction System Former American Beryllium Company Site <u>Tallevast, Florida</u>

Soil and Groundwater Sampling Program

On August 3, 2008, approximately 5,000 gallons of pumped groundwater were released from the secondary containment unit for the surge tank that is part of the interim groundwater treatment system at the Former American Beryllium Company Site in Tallevast, Florida. From August 8, 2008 to September 3, 2008, soil and water samples were collected in the vicinity of the spill area at the locations shown on Figures 1 and 2 in Attachment A. The sample locations were generally laid out as a grid pattern in and adjacent to the area impacted by the spill. There were a total of 30 sample locations as part of this sampling program.

At 16 locations, a total of four soil samples were collected from 0 to 0.5 feet below land surface (bls), 0.5 to 2 feet bls, 2 to 4 feet bls, and 4 to 6 feet bls to the water table. At 12 locations, only three soil samples were collected from 0 to 0.5 feet bls, 0.5 to 2 feet bls, and 2 to 4 feet bls because the water table was higher at those locations. Due to the presence of underground piping, only two soil samples from 0 to 0.5 feet bls and 0.5 to 2 feet bls were collected at two locations. A total of 104 soil samples were collected by a hand-auger method following the procedures in Florida Department of Environmental Protection (FDEP) Standard Operating Procedure (SOP) #FS3000.

Groundwater samples were collected in 5-foot intervals starting at the groundwater table (approximately 4 to 6 feet bls) and ending at the top of the hard streak (approximately 30 feet bls). This resulted in five groundwater samples per location. At two locations, groundwater samples were not collected due to the presence of underground piping. Groundwater samples were collected using a Geoprobe direct push sampler. A probe was pushed to the bottom of the desired interval and the probe was retracted slightly to deploy an integral well screen into the zone. A groundwater sample was collected from the screened area utilizing a peristaltic pump and dedicated tubing. A total of 140 groundwater samples were collected following the procedures in FDEP SOP #FS2200.

All samples were analyzed by TestAmerica in Tampa, Florida using United States Environmental Protection Agency (USEPA) Method 8260B for Volatile Organic Compounds (VOCs) and USEPA Method 8260C with heated purge, selective ion monitoring (SIM) and isotope dilution (ID) for 1,4-Dioxane. The analytical results for soil and groundwater samples are presented on Figures 1 and 2, respectively, in Attachment A. These results are discussed below.

Soil Results

The results of the soil samples were compared to the Residential Direct Exposure Limits, Commercial/Industrial Direct Exposure Limits and the Leachability Standards based on Groundwater Clean-up Target Levels (GCTLs). As shown on Figure 1 in Attachment A, the results for soil samples at all 30 locations were several orders of magnitude below the Residential and Commercial/Industrial Direct Exposure Limits. The results for the top two feet of soil at all 30 sample locations were below the Leachability Standards based on GCTLs. In seven of the sample locations in or near the spill area, the concentration of 1,4-dioxane was above the Leachability Standards based on GCTLs in the sample interval immediately above the water table. These results demonstrate that this soil is likely being impacted from concentrations of 1,4-Dioxane in the groundwater.

Groundwater Results

The results indicate that site related COCs are present in the shallow groundwater in the immediate vicinity of the release (Figure 2 in Attachment A). Specifically, site related COCs were detected above GCTLs in nine of the 28 samples collected from the 5 to 9 feet bls interval, and two of the 28 samples collected from the 10 to 14 feet bls interval. Isoconcentration contours for TCE and 1,4-Dioxane in the 5 to 9 feet bls interval and the 10 to 14 feet bls interval are shown on Figures 3 and 4, respectively, in Attachment A. Site related COCs were detected above GCTLs in one sample collected from the 15 to 19 feet bls interval, two samples from the 20 to 24 feet bls interval, and three samples from the 25 to 29 feet bls interval.

The results of the investigation indicate that the release from the secondary containment unit has impacted the shallow groundwater in the immediate vicinity of the spill. The maximum distance from the point of the release that impacts were detected was approximately 30 feet. Concentrations of all COCs were non detect in all samples collected further than 30 feet from the point of the release. These results show that the impacts are confined to the site and have not migrated off the property.

Interim Source Removal

An interim source removal (ISR) will be conducted to extract groundwater from the 5 to 9 feet bls interval over the approximately 1,000 square feet area with site related COCs detected above GCTLs. Groundwater will be pumped from 15 shallow extraction wells and collected in a double-walled steel storage tank for transportation off-site for proper disposal. Double containment will be provided for all water piping and the system will be manned continuously while in operation. The ISR facilities are shown on Contract Drawings 1 through 3 in Attachment B and described below.

The 15 shallow extraction wells will be located as shown on Contract Drawing 1. A detail for the extraction well is shown on Contract Drawing 3 and summarized below.

Extraction Wells

- 2-inch-diameter well with total depth of 11 feet
- 1-foot Schedule (Sch.) 40 polyvinyl chloride (PVC) sump at bottom
- 5-foot Sch. 40 PVC 10-slot screen extending from 5 feet bls to 10 feet bls
- 2-inch-diameter Sch. 40 PVC riser to above ground surface
- 6/20 sand pack
- Bentonite seal to prevent surface runoff seepage along well casing

Four sets of nested monitoring wells will also installed near the extraction wells at the locations shown on Contract Drawing 1 in Attachment B. The monitoring well construction is summarized below.

Monitoring Wells

- 2-inch-diameter well
- Shallow "S" wells with total depth of 10 feet
- Mid-range "M" wells with total depth of 18 feet
- "S" wells with Sch. 40 PVC 10-slot screen extending from 5 feet bls to 10 feet bls
- "M" wells with Sch. 40 PVC 10-slot screen extending from 16 feet bls to 18 feet bls
- 2-inch-diameter Sch. 40 PVC riser to near ground surface
- 20/30 sand pack
- Bentonite seal to prevent surface runoff seepage along well casing
- Protective flush-mount surface casing and locking cap

Each extraction well will be equipped with a pneumatically operated pump. The pumps have capacity of up to 2 gallons per minute (gpm) but the average flow from each well is expected to be 0.25 to 0.5 gpm. The air supply for the pneumatic pumps will be an existing air compressor located in the adjacent treatment building. Each well pump will have a sample tap along with isolation valves for the air supply and water discharge.

The extraction wells will discharge into a manifold consisting of ³/₄ and 1-inch-diameter Sch. 80 PVC pipe. Secondary containment for the water piping will be provided by piping or a containment tray as shown on the Contract Drawings in Attachment B. The piping from eight extraction wells will be combined in one manifold while the other seven extraction wells will combine in a second manifold. Flowmeters and sample taps are provided for each manifold, while a sample tap is provided for the combined flow from all the extraction wells.

The extraction wells will discharge into a 17,600 gallon double-walled steel storage tank. A vapor-phase carbon unit will be installed on the vent from the storage tank. As necessary, water will be removed from the storage tank using a vacuum truck and transported off-site for proper disposal. A containment area will be provided for the vacuum trucks during the loading operation.

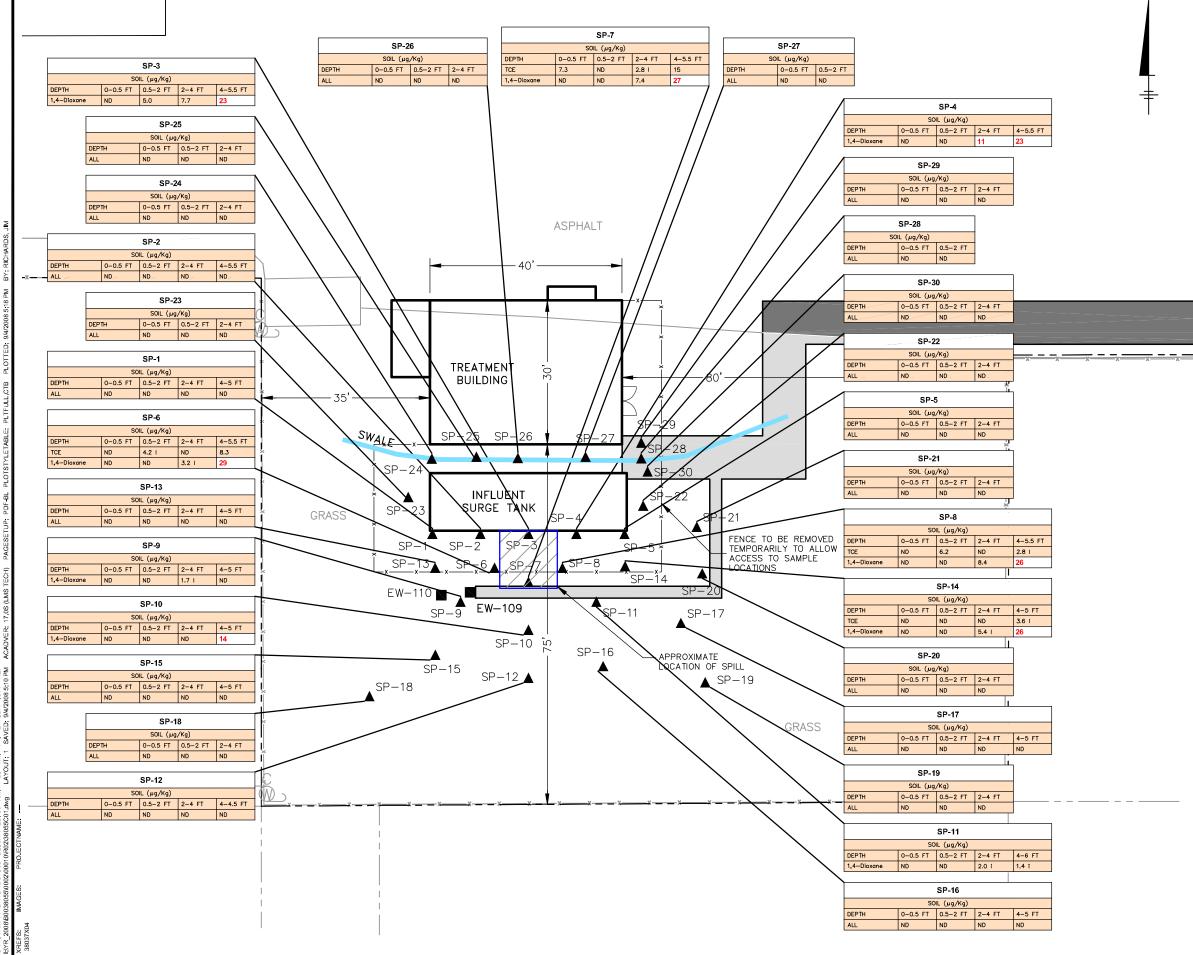
While the extraction system will be manned continuously during operation, alarms will be provided at two locations in the containment tray to detect a water leak. Additionally, alarms will be provided to detect water in the containment section of the double-walled tank and for high level in the storage tank.

Operating personnel will be responsible to monitor and record key process parameters such as extraction wells in operation, air pressure, water flow rates, groundwater levels and storage tank level. They will also closely visually observe all facilities and containment/high level alarms. Samples will be periodically collected from each extraction well, groups of extraction wells in each piping manifold, the combined flow from all the wells, in the storage tank and from monitoring wells. The samples will be analyzed for VOCs and 1,4-Dioxane. Pump flow rates will be adjusted based on the analytical results and water level measurements in order to maximize horizontal groundwater flow in the 5 to 9 feet bls interval. Continuous pumping from all wells is planned although individual well(s) may be cycled off for periods of time based on analytical results, flow rates and water levels. While the extraction system is operating, air monitoring will be conducted.

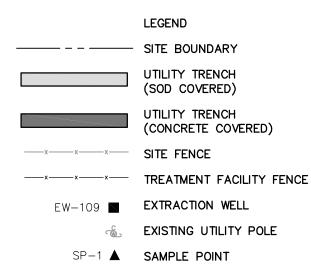
A construction schedule for the ISR is provided in Attachment C. The target date to begin start-up testing is September 19, 2008 and will continue through September 21, 2008, as necessary. The start-up of continuous operation of the groundwater extraction system will occur on September 22, 2008. Lockheed Martin plans to conduct this ISR for up to 30 days as allowed by Rule 62-780.500 of the Florida Administrative Code. Progress reports will be provided to FDEP weekly during the extraction activities. A request will be submitted to the FDEP at least 7 days in advance if Lockheed Martin expects the pumping program to extend beyond 30 days. A final project summary will be provided within 2 weeks of completion of the pumping program.

Attachment A

Results of Soil and Groundwater Sampling Program



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SOIL CONCENTRATIONS REPORTED IN MICROGRAMS PER KILOGRAM (µg/Kg)

REGULATORY LIMITS

Residental Commerical /

Leachabilit

(ug/Kg)

30

30

400

60

400

10

Industrial Direct Standard

Exposure Limit Exposure Limit Based on GCT

(ug/Kg)

9,300

18.000

2,100,000

510.000

180.000

38.000

TCE = TRICHLOROETHENE PCE = TETRACHLOROETHENE 1,1-DCA = 1,1-DICHLOROETHANE 1,1-DCE = 1,1-DICHLOROETHENEcis-1,2-DCE = cis-1,2-DICHLOROETHENE

Direct

(ug/Kg)

6,400

8.800

390,000

95.000

33.000

23.000

Parameter

TCE

PCE

1,1-DCA

1.1-DCE

cis-1,2-DCE

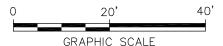
1,4-Dioxane

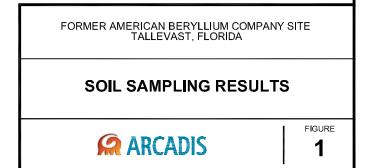
GCTL = GROUNDWATER CLEAN-UP TARGET LEVEL

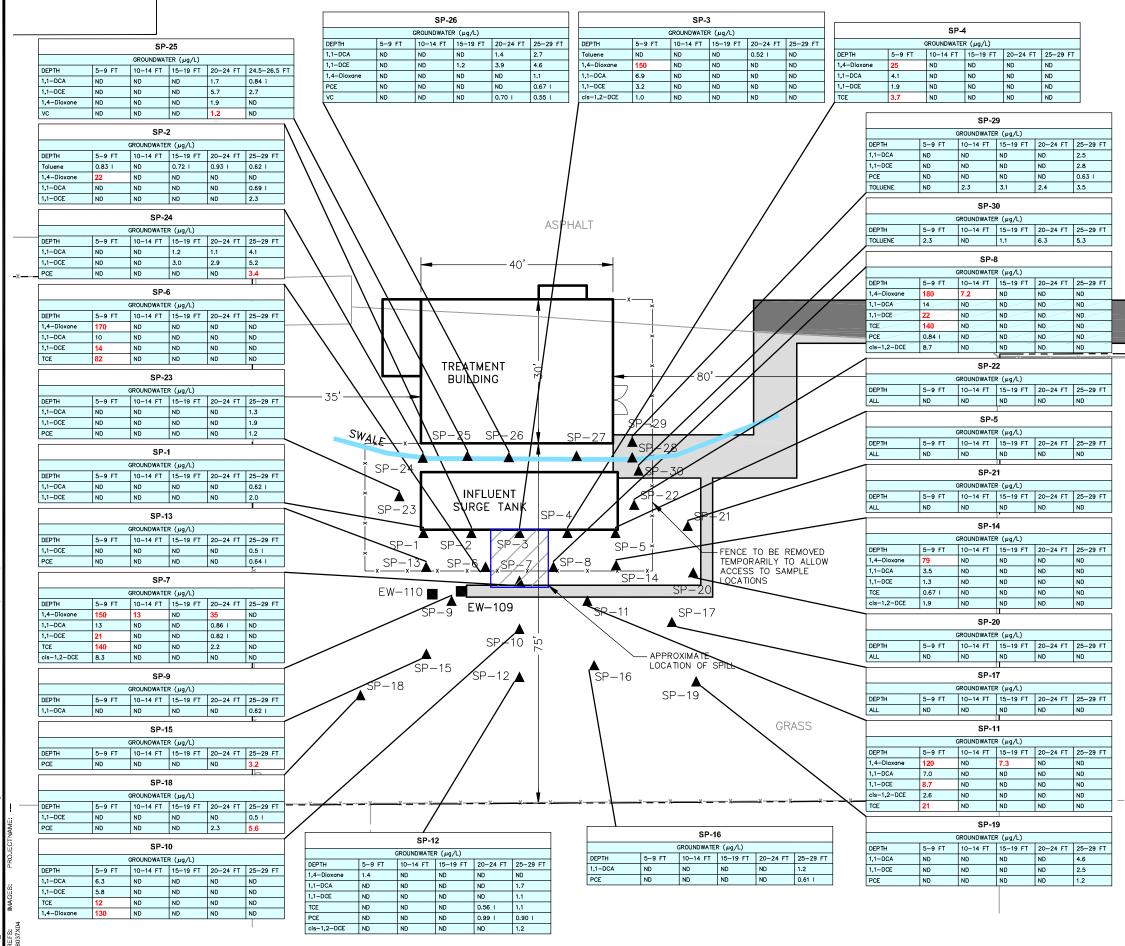
I = THE REPORTED VALUE IS BETWEEN THE LABORATORY METHOD DETECTION LIMIT (MDL) AND THE LABORATORY PRACTICAL QUANTITATION LIMIT (PQL)

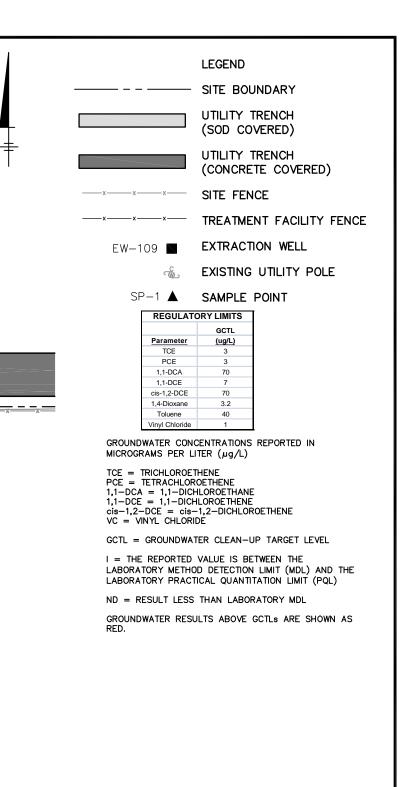
ND = RESULT LESS THAN LABORATORY MDL

SOIL RESULTS ABOVE LEACHABILITY STANDARD BASED ON GCTLs ARE SHOWN AS RED.









0 20' 40' GRAPHIC SCALE



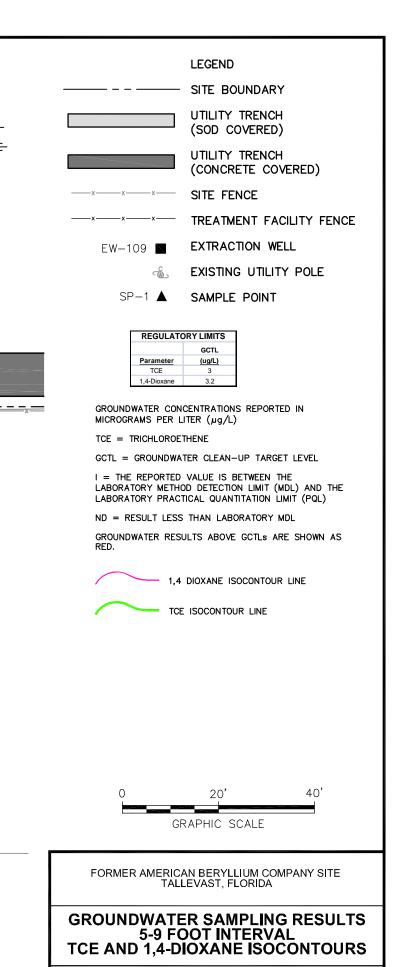
SP-25 SP-26 SP-3 SP-4 SP-29 SP-8 SP-2 GROUNDWATER (µg/L) (L) GROUNDWATER (پیر/L (L) GROUNDWATER (پیر/L (L) GROUNDWATER (Jug groundwater (µg/L) groundwater (µg/L) (L) gROUNDWATER (پیر/L DEPTH 5–9 FT DEPTH 5-9 FT DEPTH 5–9 FT DEPTH 5-9 FT DEPTH 5-9 FT DEPTH 5-9 FT 1,4-Dioxane 150 DEPTH 5-9 FT 1,4-Dioxane ND 1.4-Dioxane ND 1.4-Dioxane 1,4-Dioxane ND 1,4-Dioxane 180 1,4-Dioxane ND ND ND 3.7 TCE 140 22 TOP TCE TCE ND TCE ND SP-24 ASPHALT SP-30 GROUNDWATER (پر/L) ASPHALT GROUNDWATER (µg/L) DEPTH 5-9 FT 5-9 FT DEPTH 1,4-Dioxane ND 1,4-Dioxane ND TCE ND - 40' TCE ND SP-6 SP-22 (L) GROUNDWATER (پر/L GROUNDWATER (µg/L) DEPTH 5-9 FT DEPTH 5-9 FT 1,4-Dioxane 170 1,4-Dioxane ND TCE TCE ND SP-23 TREATMENT SP-5 GROUNDWATER (µg/L) 30, GROUNDWATER (µg/L) BUILDING DEPTH 5-9 FT 1,4-Dioxane ND DEPTH 5-9 FT 1,4-Dioxane ND TCE TCE ND SP-1 ZWATE, SP SP-21 SP +26 SP. (L) gROUNDWATER (پور) GROUNDWATER (µg/L) -28 DEPTH 5-9 FT DEPTH 5-9 FT 1,4-Dioxane ND ¢₽. 1,4-Dioxane ND TCE ND 30 TCE ND INFLUENT SP-13 SP-14 SURGE TANK GROUNDWATER (پیر/L) SP-2 GR/ (L) GROUNDWATER (پار/L DEPTH 5-9 FT DEPTH 5–9 FT 1,4-Dioxane ND 1,4-Dioxane 79 ND TOF 0.67 | TCE FENCE TO BE REMOVED SP-1 TEMPORARILY TO ALLOW /SΡ, SP-9 SP-14 ACCESS TO SP-20 (L) gROUNDWATER (پیر/ LOCATIONS GROUNDWATER (µg/L) DEPTH 5-9 FT EW-110 SP = 20DEPTH 5-9 FT 1,4-Dioxane ND 7, EW-109 -11 1,4-Dioxane ND TCE ND SP-9SE TCE ND SP-10 SP-10 SP-7 10 (L) GROUNDWATER (پر/L APPROXIMATE GROUNDWATER (µg/L) DEPTH 5-9 FT LOCATION OF SPILL SP-15 DEPTH 5-9 FT 1,4-Dioxane 130 SP-12 ▲ SP-16 1,4-Dioxane 150 SP-18 TCE 140 SP-19 SP-15 SP-17 GROUNDWATER (µg/L) (L) GROUNDWATER (پار/L GRASS DEPTH 5-9 FT DEPTH 5-9 FT 1,4-Dioxane ND 1,4-Dioxane ND TCE ND ND TCE SP-12 SP-18 SP-11 SP-16 SP-19 GROUNDWATER (µg/L) GROUNDWATER (µg/L) DEPTH 5-9 FT DEPTH 5-9 FT (L) GROUNDWATER (L) GROUNDWATER GROUNDWATER (µg/L) 1,4-Dioxane ND 1,4-Dioxane 1.4 5-9 FT DEPTH 5-9 FT DEPTH DEPTH 5–9 FT TCE TCE ND ND 1,4-Dioxane ND 1.4-Dioxane 1,4-Dioxane ND 20 ND TCE TCE TCE ND

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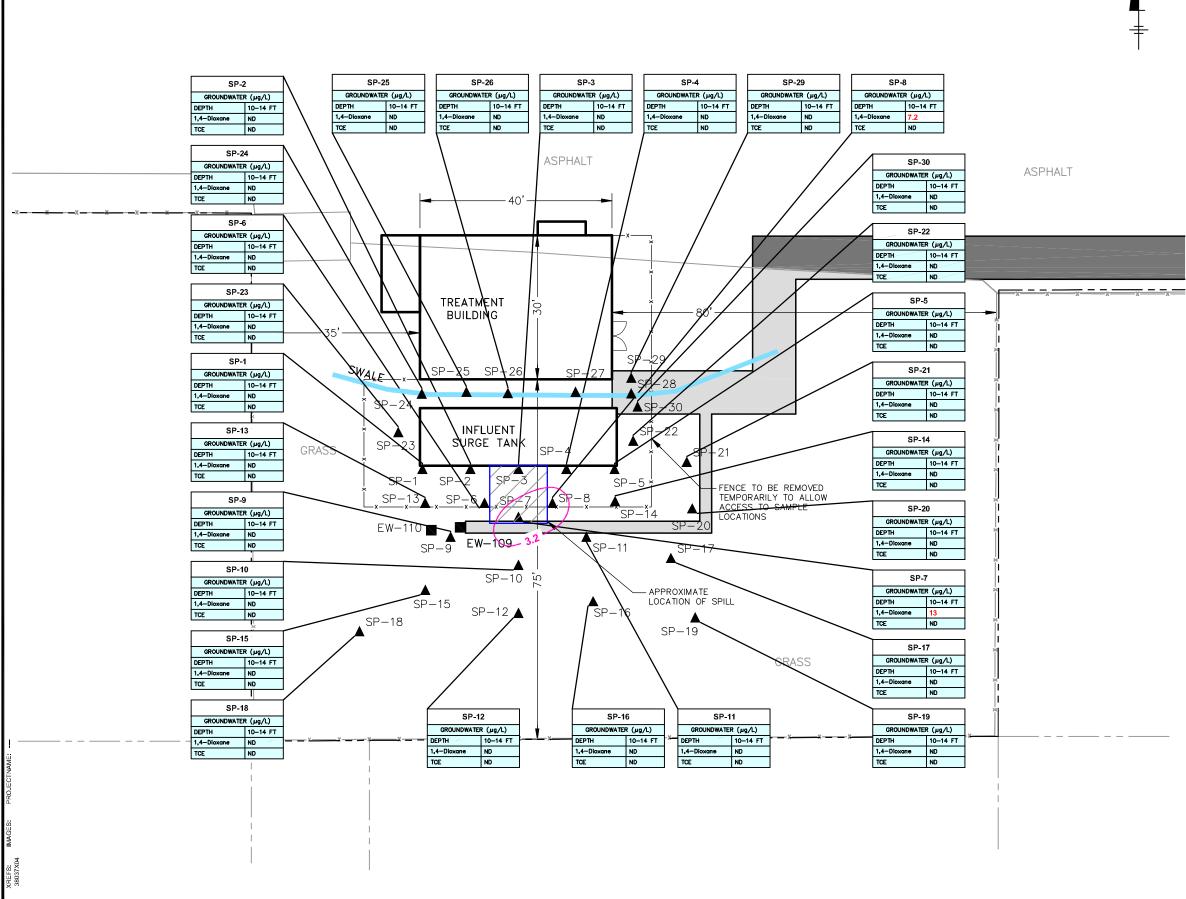
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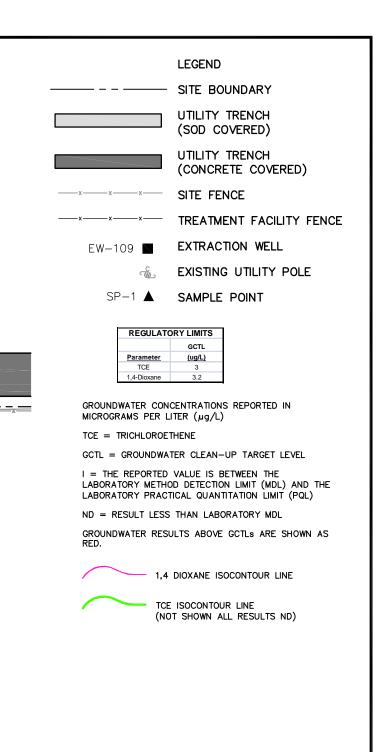


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FIGURE



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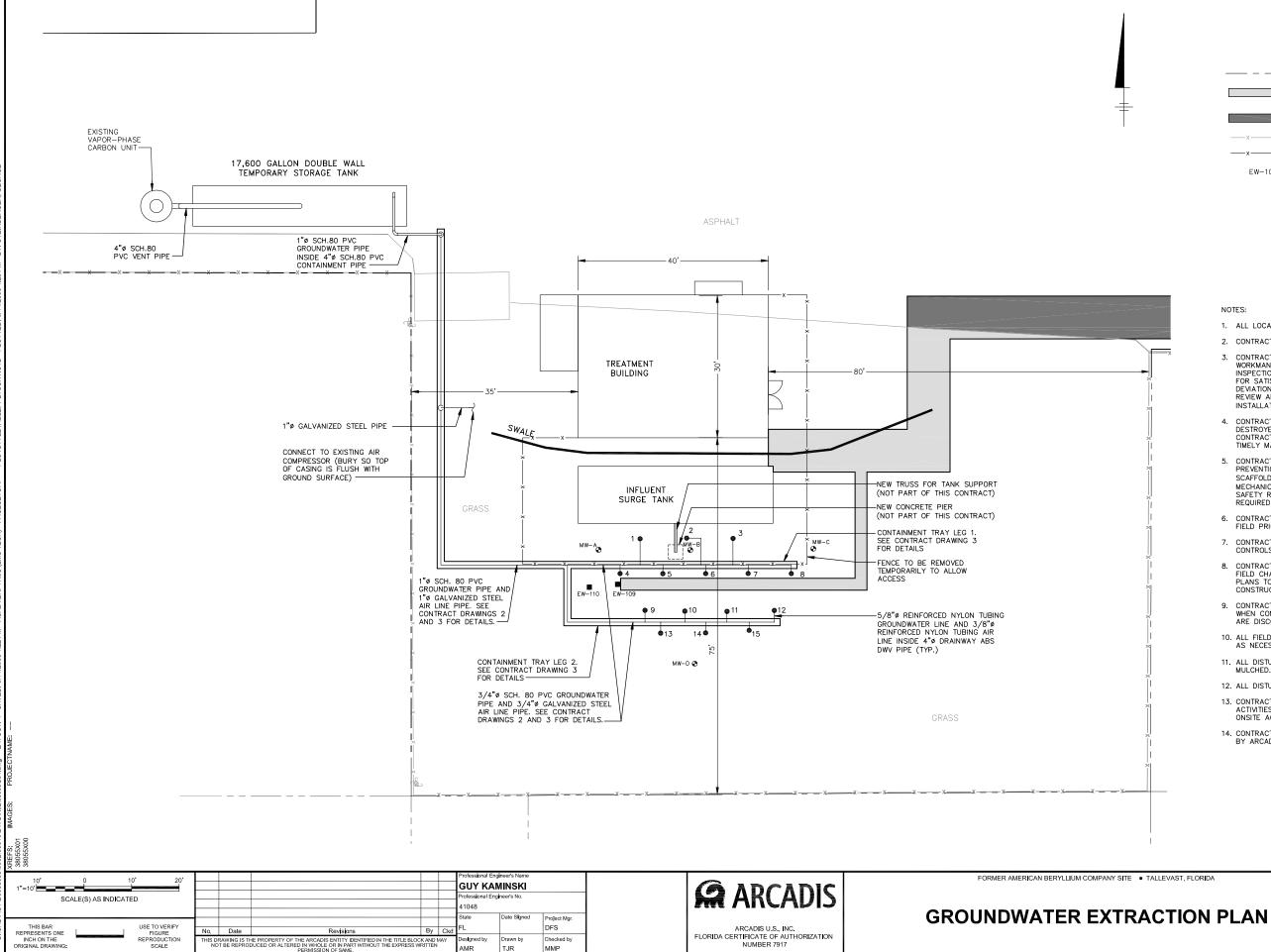


0 20' 40' GRAPHIC SCALE

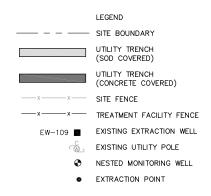


Attachment B

Interim Source Removal Contract Drawings



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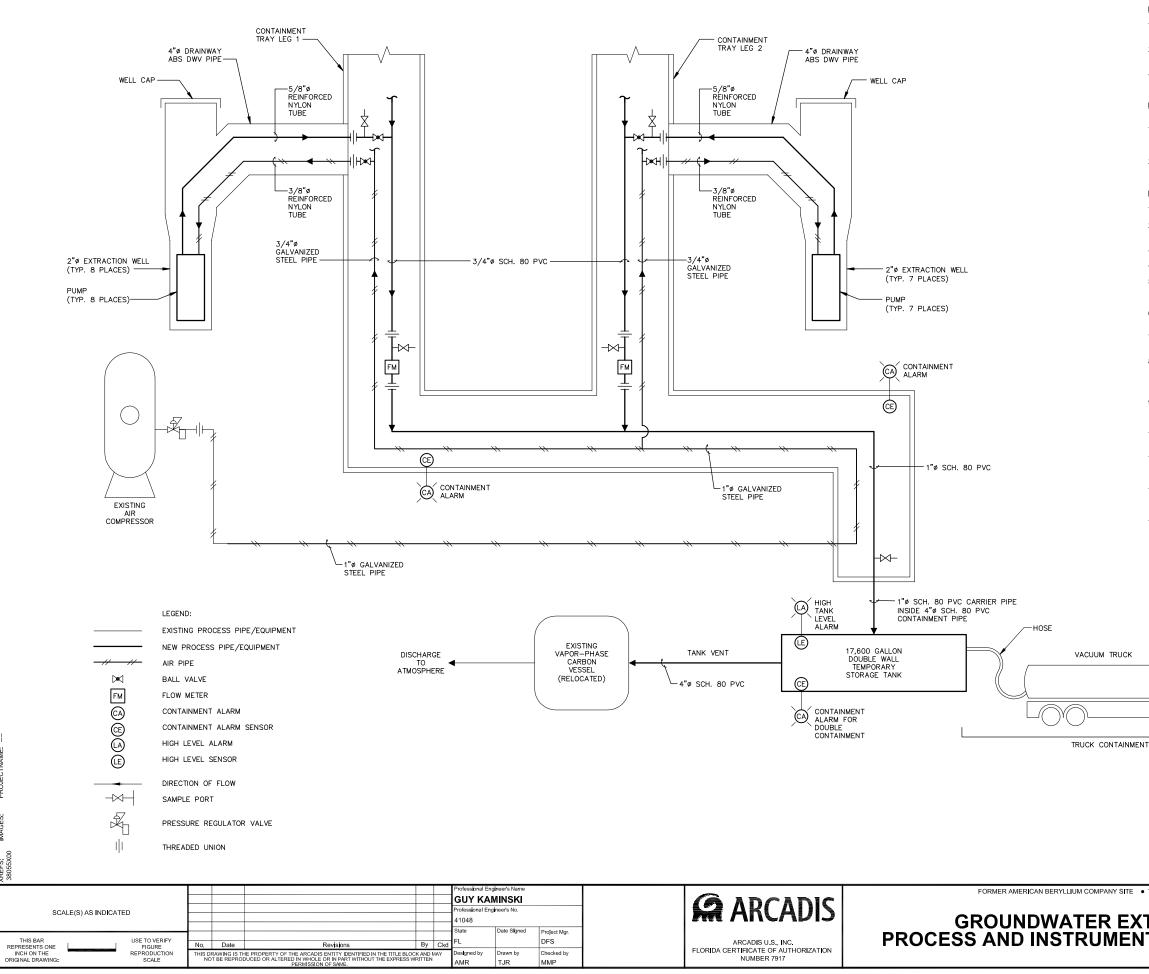


NOTES:

- 1. ALL LOCATIONS ARE APPROXIMATE.
- 2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD.
- CONTRACTOR SHALL INSTALL COMPONENTS IN A NEAT AND WORKMAN LIKE MANNER THAT ARE EASILY ACCESSIBLE FOR 3. WORMAIN LIKE MAINIER THAT ARE EASILT ACCESSIBLE FOR INSPECTION AND REPAIRS; AND ALIGN, LEVEL, AND ADJUST FOR SATISFACTORY OPERATION AND MAINTENANCE. DEVIATIONS FROM INDICATED ARRANGEMENTS ARE SUBJECT TO REVIEW AND APPROVAL BY ARCADIS US INC., PRIOR TO INSTALLATION AND/OR OPERATION.
- 4. CONTRACTOR SHALL RESTORE ALL SURFACES DAMAGED OR DESTROYED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT TO THERE PRE-CONSTRUCTION CONDITION IN A TWELLY MANNER TIMELY MANNER.
- 5. CONTRACTOR SHALL FURNISH AND PLACE PROPER GUARDS FOR PREVENTION OF ACCIDENTS, PROVIDE ALL TRENCH SHORING, SCAFFOLDING, SHIELDING, DUST/FUME PROTECTION, MECHANICAL /FLECTRICAL PROTECTION SPECIAL GROUNDING SAFETY RAILINGS, BARRIERS, OR OTHER SAFETY FEATURES AS REQUIRED
- 6. CONTRACTOR SHALL VERIFY THE LOCATION OF UTILITIES IN THE FIELD PRIOR TO INITIATING WORK UNDER THIS CONTRACT.
- 7. CONTRACTOR SHALL PROVIDE EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH APPLICABLE REGULATIONS.
- CONTRACTOR SHALL MAINTAIN A SET OF PLANS WITH CURRENT FIELD CHANGES MARKED THERE-ON AND SHALL DELIVER THESE PLANS TO ARCADIS US, INC. UPON COMPLETION OF CONSTRUCTION.
- 9. CONTRACTOR SHALL NOTIFY ARCADIS US, INC. IMMEDIATELY WHEN CONFLICTS BETWEEN DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED.
- 10. ALL FIELD SURVEYS SHALL BE PROVIDED BY THE CONTRACTOR AS NECESSARY.
- 11. ALL DISTURBED LAWN AREAS SHALL BE SEEDED AND/OR MULCHED.
- 12. ALL DISTURBED PAVED AREAS SHALL BE RESTORED.
- 13. CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH ARCADIS U.S., INC. PRIOR TO COMMENCING ONSITE ACTIVITIES.
- 14. CONTRACTOR SHALL HANDLE ALL SPOIL MATERIAL AS DIRECTED BY ARCADIS U.S., INC.

B0038055.0002.00010
Date SEPTEMBER 2008
ARCADIS 3350 Buschwood Park Drive Suite 100 Tampa, FL 33618-4447 Tel, 813-933-0697

ARCADIS Project No



MAJOR EQUIPMENT SPECIFICATIONS

- 1. EXTRACTION WELL PUMPS SHALL BE QED ENVIRONMENTAL SYSTEMS PUMP MODEL NUMBER AP2B, BOTTOM INLET OR EQUIVALENT.
- 2. TEMPORARY STORAGE TANK SHALL BE 17,600 GALLON BAKER CORPORATION MODEL AL-470-DW DOUBLE WALL TANK.
- TEMPORARY CONTAINMENT BERM FOR CONTAINMENT OF VACUUM TRUCK FOR UNLOADING OF TEMPORARY STORAGE TANK SHALL BE A 12-FOOT BY 50-FOOT SPILLGUARD PORTABLE CONTAINMENT BERM OR EQUIVALENT.

INSTRUMENT SPECIFICATIONS

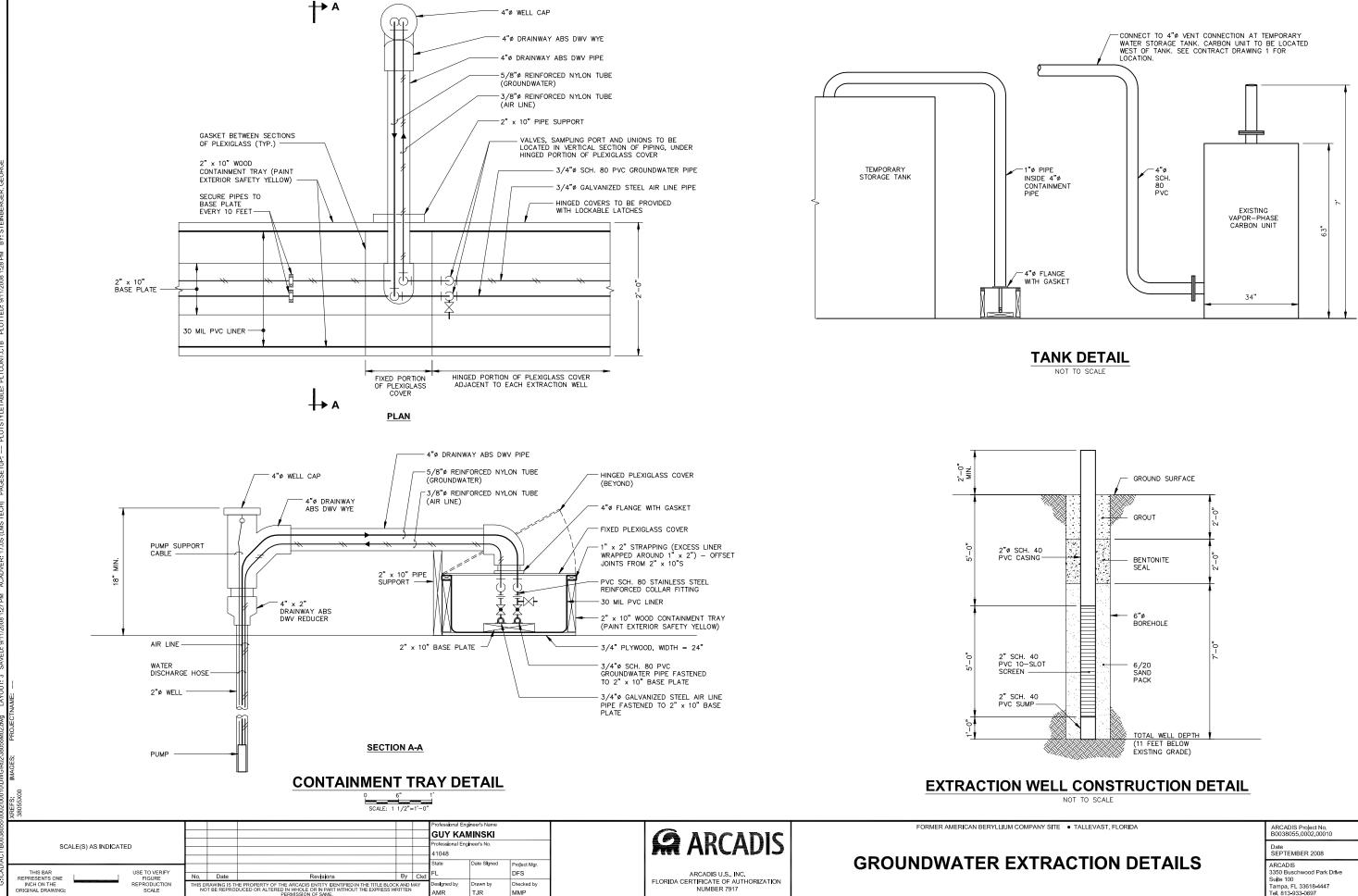
- FLOW METERS SHALL BE BADGERMETER, INC. %-INCH INDUSTRIAL MODEL M25 RCDL POSITIVE DISPLACEMENT NUTATING DISC FLOWMETER WITH BRONZE AND THERMOPLASTIC HOUSING.
- 2. LEAK DETECTION SENSOR SHALL BE A SAFE-T-TANK-CORP SAFE-T-SENTRY LEAK DETECTION MONITORING SYSTEM EQUIPED WITH 360 DEGREE VISUAL LED WARNING OR EQUIVALENT.

MECHANICAL SPECIFICATIONS

- 1. ALL PIPING SHALL BE AS SPECIFIED ON THE CONTRACT DRAWINGS.
- 2. ALL ABOVE-GROUND PIPING CARRYING WATER SHALL BE SCHEDULE 80 POLYVINYL CHLORIDE UNLESS OTHER WISE SPECIFIED ON THE CONTRACT DRAWINGS.
- 3. ALL PVC PIPE JOINTS SHALL BE SOLVENT WELDED.
- 4. ALL ABOVE-GROUND AIR PIPING SHALL BE GALVANIZED STEEL PIPE.
- ALL PVC CARRIER PIPE SHALL BE INSTALLED AND PRESSURE TESTED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS TO 50 PSI FOR 2 HOURS. ZERO LEAKAGE IS ALLOWED FOR ALL JOINTS.
- 6. ALL LEAK TESTS OF SYSTEM PIPING SHALL BE WITNESSED BY AN ARCADIS U.S., INC. REPRESENTATIVE AND DOCUMENTED.
- 7. PIPING SHALL BE SUPPORTED PRIMARILY BY THE CONTAINMENT TRAY WOOD STRUCTURE WHERE POSSIBLE.
- 8. BALL VALVES SHALL BE PVC TRUE UNION BALL VALVES WITH VITON O-RING SEAL, TEFLON SELF-LUBRICATING SEATS, TIGHT SHUT-OFF IN EITHER DIRECTION, FULL PORT DESIGN, SOLVENT WELDED SOCKET ENDS AND OPERATING HANDLE. MANUFACTURER: HAYWARD, NIBCO, PLASTO-MATIC, OR EQUIVALENT.
- 9. SAMPLE TAPS AND DRAIN VALVES SHALL CONSIST OF $\frac{1}{2}$ -INCH-DIAMETER PVC PIPE EXTENSION, BALL VALVE AND NIPPLE. SAMPLE TAPS AND DRAIN VALVES SHALL BE LOCATED AS SHOWN ON THE CONTRACT DRAWINGS.
- 10. ALL FLOW METERS SHALL HAVE A STRAIGHT PIPE AT A MINIMUM OF 10 PIPE DIAMETERS PRECEDING AND 5 PIPE DIAMETERS FOLLOWING THE METER.
- 11. THE EXACT LOCATION AND PLACEMENT OF THE LEAK DETECTION SENSORS SHALL BE DETERMINED IN THE FIELD DURING CONSTRUCTION AT THE LOW POINTS OF THE CONTAINMENT TRAY BASED ON THE TOPOGRAPHY OF THE SITE.
- 12. THE CONTAINMENT TRAY LINER SHALL BE 30-MIL PVC. THE LINER SHALL BE LAYED IN THE CONTAINMENT TRAY IN ONE CONTINUOUS RUN, WHERE POSSIBLE, AND WHEN NEEDED SEAMING OF THE LINER WILL BE SOLVENT WELDED.
- 13. CONTRACTOR SHALL LABEL ALL PIPES AND VALVES.

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SITE • TALLEVAST, FLORIDA	ARCADIS Project No. B0038055 0002 00010	
EXTRACTION	Date SEPTEMBER 2008	2
ENTATION DIAGRAM	ARCADIS 3350 Buschwood Park Drive Suite 100 Tampa, FL 33618-4447 Tel, 813-933-0697	2



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SITE • TALLEVAST, FLORIDA	ARCADIS Project No. B0038055 0002 00010	
	Date SEPTEMBER 2008	2
RACTION DETAILS	ARCADIS 3350 Buschwood Park Drive Suite 100 Tampa, FL 33618-4447 Tel, 813-933-0697	3

Attachment C

Interim Source Removal Construction Schedule

	INTERIM SOURCE REMOVAL GROUNDWATER EXTRACTION SYSTEM FORMER AMERICAN BERYLLIUM COMPANY SITE TALLEVAST, FLORIDA <u>CONSTRUCTION SCHEDULE</u>										
ID	Task Name		Sep S	7, '08 M T W T		Sep 14, '08 S M T	W T	Ser FSSS	0 21, '08 M T	WT	F S
	Complete Design				<u> </u>			. 3 3			1 3
	Install Wells										
	Survey Wells										
	Develop Wells										
	Construct Containment Structure										
	Double-Walled Storage Tank De Install Containment, Pumps and										
	Start-Up Testing	Piping							_		
	System Operations								-		
		Task		Milestone		Fxt	ernal Tasks				
Project	:: 322811225										
Date: F	Fri 9/12/08	Split		Summary			ernal Milestone				
		Progress		Project Summary		Dea	adline	$\hat{\nabla}$			
	Page 1										