Former Monarch Chemicals, Inc.
UTICA, ONEIDA COUNTY, NEW YORK

Final Engineering Report

NYSDEC Site Number: 6-33-030
ARCADIS Project TL003445.0036

Prepared for:
JCI Jones Chemicals, Inc.
100 Sunny Sol Boulevard
Caledonia, New York 14423

Prepared by:
ARCADIS U.S., Inc.
3522 Thomasville Road, 2nd Floor
Tallahassee, Florida 32309
(850) 422-2555

Revisions to Final Approved Engineering Report:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
1	November 2011	Added engineering certification	
2	February 2014	Added description of metes and bounds, amended discussion of groundwater flow to include recent data, and amended discussion of sampling frequency	

FEBRUARY 2014

CERTIFICATIONS

I, Kevin Warner, am currently a registered professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Design/Remedial Action Work Plan was implemented and that all construction activities were completed in substantial conformance with the Department-approved Final Remedial Design Report.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Design/ Remedial Action Work Plan and in all applicable statutes and regulations will be achieved in accordance with the time frames, if any, established in for the remedy.

I certify that all use restrictions, institutional controls, engineering controls, and/or any operation and maintenance requirements applicable to the Site are contained in a declaration of covenants and restrictions created and filed with the clerk of the County in which the Site is located.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all engineering controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

I certify that all documents generated in support of this report have been submitted in accordance with the Department's electronic submission protocols and have been accepted by the Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

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, Kevin Warner, of ARCADIS U.S., Inc., am certifying as Owner's Designated Site Representative for the Site.

083283-1	2/24/14	
NYS Professional Engineer #	Date	Signature

TABLE OF CONTENTS

1.0 BACKGROUND AND SITE DESCRIPTION 1

2.0 SUMMARY OF SITE REMEDY 2

2.1 Remedial Action Objectives 2
2.2 Description of Selected Remedy 3

3.0 INTERIM REMEDIAL MEASURES, OPERABLE UNITS, AND REMEDIAL CONTRACTS 5

4.0 DESCRIPTION OF REMEDIAL ACTIONS PERFORMED 6

4.1 Governing Documents 6
4.2 Remedial Program Elements 7
4.3 Contaminated Materials Removal 8
4.4 Remedial Performance/Documentation Sampling 13
4.5 Imported Backfill 14
4.6 Contamination Remaining at the Site 14
4.7 Soil Cover System 16
4.8 Other Engineering Controls 16
4.9 Institutional Controls 16
4.10 Deviations from the Remedial Action Work Plan 16

5.0 REFERENCES 18

Tables

1 Summary of Soil and Groundwater Concentrations and Remediation Goals
2 Summary of Construction Details for Dual-Phase and Groundwater Extraction Wells

Figures

1 Site Location/Vicinity Map
2 Site Map
3 PAH-Affected Soil Excavation and Confirmation Sampling Locations
4 DPE and Intermediate Zone Groundwater Extraction Well Layout
5 Groundwater Elevation Contour Maps, Shallow and Intermediate Zones, September 2008
6 Groundwater Elevation Contour Map, Shallow Zone, October 28, 2013
7 Groundwater Elevation Contour Map, Intermediate Zone, October 28, 2013

Appendices

A Professional Survey Map
B Declaration of Restrictions
C Final Engineering Drawings

1.0 BACKGROUND AND SITE DESCRIPTION

JCI Jones Chemicals, Inc. (JCI) entered into an Order on Consent (Index Number A6-0449-0107) with the New York State Department of Environmental Conservation (NYSDEC) in February 2003 to investigate and remediate the former Monarch Chemicals, Inc. (MCI) site located in Utica, Oneida County, New York. The MCI site is being remediated for commercial/industrial use.

The MCI site is located in the County of Oneida, New York, and is identified as Section 318.8, Block 1 and Lot 6 on the Oneida County Tax Map Number 318.8-1-6. The MCI site is currently situated on an approximately 3.86-acre area bounded by Lee Street and the former Mohawk Valley Oil (MVO) site to the north, National Grid hazardous waste sites to the south and west, and Meadow Street and the former MVO Lee Street terminal to the east (see Figures 1 and 2).

The boundaries of the MCI site are depicted on the surveyed map provided in Appendix A. With the exception of "ALL that tract or parcel of land" as stated in the Warranty Deed made between JCI Jones Chemicals, Inc. and Niagara Mohawk Power Corporation on October 16, 2008—which was recorded in the Oneida County Clerk's Office on October 28, 2008, as Instrument Number 2008-018351—the metes and bounds for the MCI Site are as follows:

> *ALL that tract or parcel of land situated in the City of Utica, County of Oneida and State of New York, bounded and described as follows: Commencing at a point where the westerly line of Meadow St. meets the northerly line of Lee St., and on the boundary line between the lands of Henry C. Ballou, dec'd. and the lands appropriated for the New York State Barge Canal terminal; thence N. 5°5" W. 79.21 ft. to an iron pipe driven in the grounds; thence N. 58° 10' W. 586.05 ft. to an iron pipe driven in the ground; thence S 31° 58' W. 407.63 ft. to a rail monument; thence S. 59° 15' E. 264.54 ft. to an iron fence post; thence S. 31° 21' 30" W. 115.22 ft. to an iron pipe driven in the ground; thence S. 57° 53' 30" E. 220.06ft. to an iron pipe driven in the ground; thence N. 33° 43'E. 195.12 ft. to an iron pipe driven in the ground; thence S. 57° 12' E. 141.33 ft. to the westerly line of meadow St.; thence N. 32° 6' 30" E. 262.89 ft. along the westerly line of Meadow St. to the point or place of beginning.*

2.0 SUMMARY OF SITE REMEDY

2.1 Remedial Action Objectives

Chlorinated solvents—such as tetrachloroethene (PCE) and its degradation products (trichloroethene [TCE], cis-1,2-dichloroethene [cis-1,2-DCE], trans-1,2-DCE, 1,1-DCE, vinyl chloride, 1,1,1-trichloroethane [1,1,1-TCA], and 1,1-dichloroethane)—are the primary chemicals of concern (COCs) in soil and groundwater. In addition, polynuclear aromatic hydrocarbons (PAHs) were also identified to be COCs in the soil medium. Based on the results of the Remedial Investigation, Remedial Action Objectives (RAOs) were identified for the MCI site as detailed in the sections below.

2.1.1 Groundwater Remedial Action Objectives

Remedial Action Objectives for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, contaminants volatilizing from affected groundwater.

Remedial Action Objectives for Environmental Protection

- Restore groundwater aquifer, to the extent practicable, to pre-disposal/ pre-release conditions.
- Prevent the discharge of contaminants to surface water.
- Remove the source of groundwater or surface-water contamination.

2.1.2 Soil Remedial Action Objectives

Remedial Action Objectives for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of, or exposure to, contaminants volatilizing from affected soil.

Remedial Action Objectives for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface-water contamination.
- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

Remedial Goals

- Soil and groundwater concentration ranges and remedial goals for soil and groundwater media are presented in Table 1.

2.2 Description of Selected Remedy

The MCI site is being remediated in accordance with the remedy selected by the NYSDEC in the Record of Decision (NYSDEC 2001).

The factors considered during the selection of the remedy are those listed in 6 New York Codes, Rules and Regulations 375-1.8. The following are the components of the selected remedy:

- excavation and off-site disposal of PAH-affected soil/fill exceeding 10 parts per million (ppm) total carcinogenic PAHs; excavated locations are shown on Figure 3
- installation of dual-phase extraction (DPE) wells and a treatment system to remediate PCE-affected soil and groundwater in the shallow aquifer (Figure 4)
- installation of groundwater-extraction wells and treatment system to remediate and hydraulically control groundwater in the intermediate aquifer (Figure 4)
- execution and recording of Declaration of Restrictions to limit land use and prevent future exposure to potential remaining contamination at the MCI site
- construction and maintenance of a soil cover system consisting of 2 feet of clean fill covering PAH-excavated areas at the MCI site to prevent human exposure

- development and implementation of a Site Management Plan (SMP) for long-term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance, and (4) reporting; a revised SMP was submitted to NYSDEC in January 2014
- periodic certification of the institutional and engineering controls as listed in Appendix B

Results of natural attenuation parameter sampling indicated natural attenuation via biodegradation processes to be an effective component of overall remedial strategy for residual groundwater concentrations (LFR 2004). Analytical data from periodic groundwater monitoring will be used to evaluate the overall effectiveness of natural attenuation on residual groundwater contamination. Biodegradation enhancements, such as injecting agents (e.g., ethanol), may be conducted if the periodic groundwater-monitoring data do not indicate natural attenuation to be achieving remedial goals. A comprehensive work plan will be prepared for NYSDEC's review and approval prior to injecting any biodegradation enhancements.

3.0 INTERIM REMEDIAL MEASURES, OPERABLE UNITS, AND REMEDIAL CONTRACTS

No interim remedial measures, operable units, or separate construction contracts were performed.

4.0 DESCRIPTION OF REMEDIAL ACTIONS PERFORMED

Remedial activities at the MCI site are being conducted in accordance with the NYSDEC-approved Remedial Design/Remedial Action Work Plan (RAWP; LFR 2003) and the Final Remedial Design (RD; LFR 2005). All deviations from the RAWP or the Final RD are noted below.

4.1 Governing Documents

4.1.1 Site-Specific Health and Safety Plan

All remedial work performed under this Remedial Action was in full compliance with governmental requirements, including site and worker safety requirements mandated by the Occupational Safety and Health Administration.

The Health and Safety Plan (HASP; LFR 2009a) was complied with for all remedial and invasive work performed at the MCI site.

4.1.2 Quality Assurance Project Plan

The Quality Assurance Project Plan (QAPP) was included as Appendix B in the RAWP (LFR 2003) approved by NYSDEC. The QAPP describes the specific policies, objectives, organization, functional activities, and quality assurance/quality control activities designed to achieve the project data-quality objectives.

4.1.3 Construction Quality Assurance Plan

The Construction Drawings and Technical Specifications presented in the Final RD (LFR 2005) were used to monitor construction quality and confirm that remedial construction was in conformance with the remediation objectives and specifications.

4.1.4 Soil/Materials Management Plan

The Phase I Remedial Action Work Plan (JCI 2006) summarizes detailed plans for excavating and backfilling of the PAH-affected surface soils that were removed from the four isolated areas (Figure 3). Approximately 310 tons (207 cubic yards) of surface soils were removed and disposed off site. Certified clean backfill was brought in to fill the excavation areas.

4.1.5 Community Air Monitoring Plan

During excavation, continuous air monitoring was conducted in accordance with the Community Air Monitoring Plan (CAMP; LFR 2008) and site-specific HASP. A miniature real-time aerosol monitor and an organic vapor analyzer equipped photoionization detector were used to monitor total dusts and volatile organic compounds (VOCs). Action levels for initiating engineering controls and/or stopping work during air monitoring was established in the CAMP. Action levels for particulate dusts and VOCs were set at 100 micrograms per cubic meter and 5 ppm above background, respectively. Readings were taken approximately every 15 minutes and recorded on air-monitoring forms (LFR 2009b). Action levels for either total dusts or VOCs were not exceeded during excavation.

4.1.6 Contractors Site Operations Plans

The Remediation Engineer reviewed all plans and submittals for this remedial project (i.e., those listed above, plus contractor and subcontractor submittals) and confirmed that they were in compliance with the Final RD (LFR 2005). All remedial documents were submitted to NYSDEC and the New York State Department of Health in a timely manner and prior to the start of work.

4.1.7 Citizen Participation Plan

The Citizen Participation Plan presented in the RAWP (LFR 2003) was followed for community participation. It should be noted that there is a sparse residential population in the vicinity of the MCI site, which is located in the Harbor Point area of Utica, New York—a former heavily industrialized area where most of the facilities/properties have been razed with active ongoing environmental remediation.

4.2 Remedial Program Elements

4.2.1 Contractors and Consultants

The following contractors were used to conduct tasks associated with remedial actions at the MCI site:

- Lyon Drilling, Inc., Tully, New York – installation of DPE and groundwater-extraction wells

- Royal Environmental Services, Inc., Syracuse, New York – remedial construction
- Abscope Environmental Services, Canastota, New York – soil excavation
- Maple Leaf Environmental, Inc., Tampa, Florida – treatment system equipment
- Thew Associates, Marcy, New York – professional survey
- Columbia Analytical Services, Rochester, New York – laboratory analysis
- Upstate Analytical Laboratories, Inc., East Syracuse, New York – laboratory analysis

4.2.2 Site Preparation

A pre-construction meeting was held with NYSDEC and all contractors in April 2009. The vacant buildings and sheds were razed in June/July 2009. A NYSDEC-approved project sign was erected at the project entrance gate facing Lee Street.

4.2.3 Community Air Monitoring Plan Results

Results of air-quality and dust monitoring were below the action levels. The results of the air monitoring are discussed in the Phase I Remedial Action Completion Report (LFR 2009b).

4.2.4 Reporting

All reports—including those detailing periodic operation, maintenance, and monitoring—are provided in electronic format.

4.3 Contaminated Materials Removal

4.3.1 Removal of PAH-Affected Soil

PAH-affected surface soils/fill material at four separate areas of the MCI site were removed and disposed off site; excavation details are present in the Phase I Remedial Action Completion Report (LFR 2009b). Areas of soil excavation are shown on Figure 3. A list of the soil cleanup objectives (SCO) for the primary COCs is provided in Table 1.

The excavation activities were completed in December 2008. Excavation was conducted with a backhoe to a depth of 2 feet below ground surface (bgs). The total

volume of excavated soil was approximately 207 cubic yards (310 tons). Excavated soil was directly transferred to a dump truck. As per the property agreement entered between JCI and National Grid, the excavated soil was disposed of on the adjacent National Grid facility (National Grid was consolidating large volumes of contaminated source material from other areas of their site for placement at their former water gas plant as part of the overall remedy). Currently, a slurry wall and a surface cap encapsulates the source material placed on the former water gas plant. The proposed excavation and disposal of the PAH-affected soil was approved by NYSDEC.

Excavation and removal of PAH-affected soil was limited to the upper 2 feet only, as the remedial goal was to prevent direct exposure. The cleanup target for the PAH-affected soil was 10 milligrams per kilogram (mg/kg) for total carcinogenic PAHs. Surface-soil sampling during the Remedial Investigation phase (LFR 1999) indicated low levels of PAHs in four isolated areas of the MCI site as shown on Figure 3. The PAHs were limited in extent and isolated, and the source appeared to be fill material that was reportedly used in the region. At each of these areas, 2 feet of PAH-affected soil/fill that exceeded cleanup target of 10 mg/kg total carcinogenic PAHs was excavated and disposed off site. Soil samples were collected to confirm the cleanup target was met (LFR 2009b). A cover consisting of 2 feet of clean bank-run gravel was placed over each of the excavated areas. The imported fill was pre-certified clean by the remedial contractor and, as such, no samples were taken.

Based on soil and groundwater analytical data (LFR 1999), the volume of PAH-affected soil remaining beneath the cover does not appear to pose a significant concern. The primary COCs at the MCI site are chlorinated solvents, for which active remedial actions are ongoing. The Declaration of Restrictions recorded with the Oneida County Clerk's Office restricts the MCI site to only commercial/industrial use, and requires due diligence prior to any improvements involving subsurface excavation. The Declaration of Restrictions is provided in Appendix B.

4.3.2 Removal of Chlorinated Solvents

As chlorinated solvents-affected soil and groundwater remain at the MCI site, Engineering Controls (ECs) are required to protect human health and the environment.

The MCI site has the DPE and groundwater-extraction system as the primary EC, as described in the following subsections.

Remedial System Equipment

Twenty-seven shallow-zone DPE wells, three horizontal soil-vapor extraction (SVE) wells, and four intermediate-zone groundwater-extraction wells were installed during September 2009. The DPE and groundwater-extraction well construction details are summarized in Table 2; the well locations are shown on Figure 4. The final Engineering Drawings present the as-built details regarding well construction, trenching and piping, treatment building layout, extraction wells stub-up and manifold, process and instrumentation, and sewer discharge (Appendix C).

The DPE wells (RW-1 through RW-27) were completed to a depth of approximately 16.5 feet bgs; the wells were installed using the hollow-stem auger drilling method. The DPE wells are constructed of 4-inch-diameter, flush-joint, stainless-steel casing and well screen, and the screened interval of each well is 0.010-inch slotted, flush-joint, stainless-steel well screen, extending from 4 to 16.5 feet bgs. The annular space of each borehole from 4 to 16.5 feet bgs was filled with a 20/30 sand pack, and then a bentonite-cement seal was installed in the remaining annular space up to the bottom of the vault. Each well was completed in a locking, steel vault. DPE wells are equipped with 1-inch-diameter drawtubes, sanitary well seals, and sampling ports. Details of a typical DPE well are present in Appendix C (Sheet 5).

The intermediate-depth groundwater-extraction wells (IRW-1 to IRW-4) were installed to a depth of approximately 35 feet bgs (IRW-1 was installed during pre-RD work in 2005). The DPE wells were constructed of 5-inch-diameter polyvinyl chloride (PVC) flush-joint casing and well screen. The screened interval of each well is 0.02-inch continuous slotted, flush-joint PVC well screen, and extends from 20 to 35 feet bgs. The annular space of each borehole from 17.5 to 35 feet bgs was filled with a 20/30 sand pack, and then bentonite-cement seal was installed in the remaining annular space up to the bottom of the vault. Each well was completed in a locking, steel vault with electrical wiring/conduit and includes a pit-less adapter that supports a Grundfos pump and 1-inch-diameter galvanized steel pump riser pipe (Appendix C).

The DPE and intermediate-zone groundwater-extraction wells are piped to a treatment system and control equipment that is housed inside secured trailers. The DPE system supplies vacuum via an oil-sealed, liquid-ring pump. The speed of the motor is adjusted by a soft-start, variable-frequency drive. The supplied vacuum extracts affected groundwater and soil vapors from the shallow zone through the DPE wells that are configured in a five-zone manifold controlled by motorized valves. DPE wells are connected on each of the five DPE vacuum manifolds as detailed below:

- Zone 1: RW-22, RW-5, RW-25, RW-23, and RW-11
- Zone 2: RW-13, RW-21, RW-20, RW-6, and RW-17
- Zone 3: RW-1, RW-2, RW-3, RW-4, and RW-16
- Zone 4: RW-8, RW-9, RW-7, RW-10, and RW-24
- Zone 5: RW-15, RW-19, RW-14, RW-18, and RW-12

The DPE well locations are shown on Figure 4. Two DPE wells (RW-26 and RW-27) and the three horizontal SVE wells are yet not connected to the treatment system.

The motorized dilution valves control the amount of vacuum applied to the DPE zones. A chemical-injection system between the DPE manifold and the air-stripping unit helps control iron-fouling as affected groundwater travels through equipment. The air/vapor mixture from the shallow zone is then drawn into a vapor/liquid separator tank. Two progressive-cavity pumps transfer the liquid-phase contaminants to the air-stripping unit for treatment.

Affected groundwater is also pumped from the four intermediate extraction wells via submersible pumps to the air-stripping unit. The treated liquid is then pumped via a centrifugal transfer pump to two parallel routed bag filters. The filters were installed in parallel to remove particulates from the extracted fluids before treatment. The liquid is then routed to the liquid-phase carbon units for secondary groundwater treatment. The liquid-phase carbon units are installed in a parallel configuration; the treated water is then discharged to the sewer under a NYSDEC-approved permit (State Pollutant Discharge Elimination System [SPDES] Permit Number NY-0257206).

Vapors from the DPE wells and from the air-stripping unit are treated separately. The vapors from the vapor/liquid separator are drawn to the liquid-ring pump. From the liquid-ring pump, the vapors are then routed to a heat exchanger located in an adjacent trailer. The vapors are then sent to two 2,000-pound, high-pressure granular-activated carbon (GAC) units in a series configuration before being discharged to the atmosphere. A photoionization detector was also installed between the heat exchanger and the GAC units to monitor contaminant levels in real time and assist in controlling the five-zone DPE manifold.

Vapors from the air-stripping unit are first routed to a radiator/heat exchanger designed to heat the vapors and keep liquid condensation from developing. The heated vapors are then sent to the two air stripper-dedicated GAC units, also located in the adjacent trailer. Vapors are then discharged to atmosphere.

The system is controlled by input from various sensors to a programmable logic controller. Automated control can be adjusted and modified via programming changes. Manual control is also possible, as the system provides for user control by a telemetry link via the internet. An additional timer and relay were installed to control the chemical-injection system to the DPE manifold.

Remedial System Startup and Operation

The DPE system was started during week of April 19, 2010. The system has been in continuous operation since then, and monthly and semiannual maintenance and monitoring are being performed; results are present in the Semiannual Monitoring Reports.

Groundwater levels are measured in the shallow and intermediate zones during each monitoring event. Groundwater elevation contour maps for the shallow and intermediate zones are shown on Figure 5 (September 2008, prior to system startup) and Figures 6 and 7 (October 2013, during system operation).

Groundwater flow in the shallow zone is generally to the northeast, toward the harbor, which is consistent with previous flow evaluations. Hydraulic gradient is relatively flat, ranging from approximately 0.001 to 0.007 foot per foot (ft/ft; Figure 6).

The groundwater elevation in MW-415S (off-site shallow well across Lee Street) is higher compared to the groundwater elevations in shallow monitoring wells (MC-5, MWS-25, MWS-26, and MC-4) at the northern boundary of the MCI site. The higher elevation in MW-415S suggests that gradient is toward the MCI site, indicating hydraulic capture and groundwater flow from MW-415S is toward the MCI site.

In the intermediate zone, groundwater flow is toward northeast during non-pumping conditions. However, the flow is influenced by the pumping of intermediate-zone recovery wells (IRW-1 through IRW-4). The lower groundwater elevations observed in IRW-2, MWI-6, IRW-3, and IRW-4 compared to MW-416I and MWI-5 indicates a hydraulic gradient toward the MCI site; hydraulic containment is apparent in the vicinity of IRW-2 and IRW-3. In the central portion of the MCI site (in vicinity of IRW-1), the hydraulic gradient is nearly flat (approximately 0.005 ft/ft), indicating influence from the intermediate pumping well IRW-1. Comparison of groundwater elevations between nested shallow and intermediate wells indicate a downward (vertical) hydraulic gradient.

Procedures for operating and maintaining the DPE and groundwater-extraction and treatment systems are documented in the Operation and Maintenance Plan (Section 4 of the SMP). Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of the SMP); the Monitoring Plan also addresses inspections in the event of a severe condition, which may affect controls at the MCI site.

4.4 Remedial Performance/Documentation Sampling

Immediately upon excavation of the PAH-affected soils in December 2008, confirmation samples were collected from the side walls of each excavation location. Only those side walls, where limits of excavation could be extended in the event confirmatory samples exceeded the SCO, were sampled. Samples were analyzed for PAHs using United States Environmental Protection Agency Method 8270. End-point sampling locations are shown on Figure 3. Detailed analytical results are present in the Phase I Remedial Action Completion Report (LFR 2009b).

Total carcinogenic PAH concentrations (19.2 mg/kg) exceeded the SCO of 10 mg/kg in only one sample (Area #1 CS #4; collected from the southeast wall of

Area #1 excavation). The results appeared anomalous and the location was re-sampled with NYSDEC approval. Confirmatory sample Area #1 CS #4R was collected from near the previous location of sample Area #1 CS #4 in February 2009; analytical results indicated total carcinogenic PAHs to be below the remedial action goals (RAGs).

Semiannual monitoring of system operation, as well as sampling of monitoring wells at the MCI site, are conducted and summarized in semiannual reports. However, samples are collected and analyzed on a monthly basis from the groundwater remediation system effluent. Results from these monthly sampling events are used to support compliance with the SPDES permit.

4.5 Imported Backfill

The confirmatory sample results were discussed with NYSDEC and, based on their approval, the four excavation areas were backfilled in March 2009. ABSCOPE (soil excavation contractor) arranged for the delivery of the fill material that was used to backfill the excavated areas. Bank-run gravel was used to backfill the excavated area. The backfill was certified clean by the remedial subcontractor; samples of the imported fill were not taken, as this requirement appeared to be exempted as outlined in DER-10 (NYSDEC 2010). The volume of bank-run gravel backfill used in each of the four excavated areas is provided below:

Location	Dimensions (Feet)	Volume
Area #1	50 X 20 X 2	76 Cubic Yards
Area #2	50 X 20 X 2	76 Cubic Yards
Area #3	50 X 10 X 2	40 Cubic Yards
Area #4	30 X 10 X 2	24 Cubic Yards
	TOTAL	**216 CUBIC YARDS**

4.6 Contamination Remaining at the Site

Below is a summary of site conditions when the RI was performed in the late 1990s and updated in 2004:

Soil

- Contaminants identified in soil/fill include primarily chlorinated solvents, including PCE, TCE, and 1,1,1-TCA. Degradation products of these chlorinated solvents are also present at significant concentrations.
- The PAHs were limited in extent and isolated, as the source appeared to be related to the fill material that was reportedly used in the region. At each of these areas, 2 feet of PAH-affected soil/fill that exceeded cleanup target of 10 mg/kg total carcinogenic PAHs was excavated and disposed off site. A cover consisting of 2 feet of clean soil was placed over each of the excavated areas. PAH-affected soil may remain below 2 feet bgs; however, the volume of PAH-affected soil remaining beneath the cover does not appear to pose a significant concern. The primary COCs at the MCI site are chlorinated solvents, for which active remedial actions are ongoing. The Declaration of Restrictions recorded with the Oneida County Clerk's Office restricts site use to only commercial/industrial, and requires due diligence prior to any improvements involving subsurface excavation. The Declaration of Restrictions is provided in Appendix B.
- Ranges of contaminant concentrations in soil are summarized in Table 1; applicable RAGs for the soil medium are also included.

Site-Related Groundwater

- Contaminants in groundwater include primarily chlorinated solvents, including PCE, TCE, 1,1,1-TCA, and their degradation products.
- Ranges of contaminant concentrations in groundwater are presented in Table 1; RAGs for the groundwater medium are also included.

As contaminated soil, groundwater, and soil vapor remains beneath the MCI site after completion of the Remedial Action, ECs and Institutional Controls (ICs) are required to protect human health and the environment. These ECs/ICs are described in the following sections. Long-term management of these EC/ICs and residual contamination will be performed under the SMP approved by the NYSDEC.

4.7 Soil Cover System

Exposure to potentially remaining PAH-affected contamination in soil/fill at the MCI site is minimized by a soil cover system placed over each of the excavated areas (Figure 3). This cover system is comprised of a minimum of 2 feet of clean bank-run gravel and/or concrete building slabs.

4.8 Other Engineering Controls

As remaining contaminated soil and groundwater exist beneath the MCI site, ECs are required to protect human health and the environment. The MCI site has the DPE system as the primary EC; the DPE system is described in detail in Section 4.3.2 above. Other ECs include the security fence with signage surrounding to limit unauthorized access. Access is through two locking gates on Meadow and Lee Streets.

4.9 Institutional Controls

The MCI site remedy requires that environmental restrictions be placed on the property to (1) restrict groundwater use; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and (3) limit the use and development of the MCI site to commercial/industrial uses only.

The Declaration of Restrictions for the MCI site was executed and filed with the Oneida County Clerk on June 18, 2003; the County Recording Identifier number for this filing is 2003-014260. A copy of the Declaration of Restrictions is provided in Appendix B.

4.10 Deviations from the Remedial Action Work Plan

There were no significant deviations from the RAWP. Twelve additional DPE and three horizontal SVE wells were installed; the additional DPE wells were installed in consultation with the NYSDEC to maximize performance efficiency. The three horizontal SVE wells, which were not part of the remedial design, were installed during the installation of the DPE system. These wells are currently not connected to the treatment vacuum system, and may be connected at a later date in the event additional vapor extraction is needed to influence a larger area in the vadose zone. A chemical-

injection system was also installed between the DPE manifold and the air-stripping unit to alleviate iron fouling.

5.0 REFERENCES

ARCADIS. 2014. Site Management Plan. Former Monarch Chemicals, Inc., Utica, New York. NYSDEC Site Number 6-33-030. January.

JCI Jones Chemicals, Inc. (JCI). 2006. Phase I Remedial Actions. March 13.

LFR Inc. 1999. Remedial Investigation Report: Former Monarch Chemicals, Inc. Site, Utica, New York. New York State Department of Environmental Conservation, Site Number 6-33-030. March 16.

———. 2003. Remedial Design/Remedial Action Work Plan, Former Monarch Chemicals, Inc. Site, Utica, New York. New York State Department of Environmental Conservation, Site Number 6-33-030. October 27.

———. 2004. Pre-Remedial Design Sampling Summary Report, Former Monarch Chemicals, Inc. Site, Utica, New York. New York State Department of Environmental Conservation, Site Number 6-33-030. October 25.

———. 2005. Final Remedial Design Report, Former Monarch Chemicals, Inc. Site, Utica, New York. New York State Department of Environmental Conservation, Site Number 6-33-030. July 29.

———. 2008. Site-Specific Community Air Monitoring Plan, Former Monarch Chemicals, Inc. Site, Utica, New York. December 15.

———. 2009a. Health and Safety Plan, Former Monarch Chemicals, Inc. Site, Utica, New York. New York State Department of Environmental Conservation, Site Number 6-33-030.

———. 2009b. Phase 1 Remedial Action Completion Report, Former Monarch Chemicals, Inc. Site, Utica, New York. New York State Department of Environmental Conservation, Site Number 6-33-030. April 17.

New York State Department of Environmental Conservation (NYSDEC). 2001. Record of Decision, Monarch Chemicals Site, City of Utica, Oneida County Site Number 6-33-030. March.

———. 2003. Order on Consent Index Number A6-0449-0107.

———. 2010. DER-10 Technical Guidance for Site Investigation and Remediation. May.

Final Engineering Report
Former Monarch Chemicals, Inc. Facility, Utica, New York

Table 1. Summary of Soil and Groundwater Concentrations and Remediation Goals

Chemical of Potential Concern	Unsaturated Soil (mg/kg)	Soil Remediation Goal[1] (mg/kg)	Groundwater (µg/l)	Groundwater Remediation Goal[2] (µg/l)
Tetrachloroethene	0.074 - 1000	1.4	3 - 42,000	5
Trichloroethene	0.009 - 33	0.7	3 - 3,500	5
Cis-1,2-Dichloroethene	0.005 - 31	0.3	5 - 19,000	5
Trans-1,2-Dichloroethene	0.001 - 0.012	0.3	1 - 250	5
1,1-Dichloroethene	0.001 - 0.052	0.4	2 - 350	5
Vinyl chloride	0.045 - 6.7	0.2	2 - 1,400	2
1,1,1-Trichloroethane	0.001 - 2.3	0.8	9 - 2,100	5
1,1-Dichloroethane	0.001 - 0.065	0.2	2 - 2,600	5
Total Carcinogenic Polynuclear Aromatic Hydrocarbons	NA	10	NA	NA

Notes:

[1] Values are based on NYSDEC TAGM #HWR-94-4046

[2] Values are based on NYS Groundwater Quality Standard 6 NYCRR Part 703.5 and NYSDEC TAGM #HWR-94-4046

mg/kg = milligram per kilogram

µg/l = microgram per liter

Final Engineering Report
Former Monarch Chemicals, Inc. Facility, Utica, New York

Table 2. Summary of Construction Details for Dual-Phase and Groundwater Extraction Wells

Well Identification	Northing	Easting	Top of PVC (feet NAVD88)	Top of Casing Elevation (feet NAVD88)	Ground Elevation (feet NAVD88)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Well Diameter (inches)	Casing Material	Date Installed
DPE Wells										
RW-1	1,135,392.2	1,182,719.5	406.87	407.67	407.7	16.5	4 - 16.5	4	SS	Sep-09
RW-2	1,135,373.1	1,182,767.5	406.45	407.35	407.3	16.5	4 - 16.5	4	SS	Sep-09
RW-3	1,135,368.0	1,182,803.2	406.02	406.92	406.9	16.5	4 - 16.5	4	SS	Sep-09
RW-4	1,135,286.8	1,182,807.0	407.57	408.47	408.5	16.5	4 - 16.5	4	SS	Sep-09
RW-5	1,135,248.1	1,182,817.4	408.96	409.86	409.9	16.5	4 - 16.5	4	SS	Sep-09
RW-6	1,135,189.3	1,182,809.5	408.84	409.64	409.6	16.5	4 - 16.5	4	SS	Sep-09
RW-7	1,135,108.2	1,182,845.2	408.30	409.10	409.1	16.5	4 - 16.5	4	SS	Sep-09
RW-8	1,135,077.2	1,182,887.9	408.30	409.10	409.1	16.5	4 - 16.5	4	SS	Sep-09
RW-9	1,135,057.5	1,182,920.9	408.55	409.35	409.4	16.5	4 - 16.5	4	SS	Sep-09
RW-10	1,135,044.4	1,182,851.1	408.37	408.87	408.9	16.5	4 - 16.5	4	SS	Sep-09
RW-11	1,135,082.7	1,182,783.8	408.28	408.78	408.8	16.5	4 - 16.5	4	SS	Sep-09
RW-12	1,135,143.4	1,182,781.3	408.75	409.15	409.2	16.5	4 - 16.5	4	SS	Sep-09
RW-13	1,135,214.2	1,182,771.6	409.24	409.94	409.9	16.5	4 - 16.5	4	SS	Sep-09
RW-14	1,135,175.7	1,182,743.0	408.26	408.86	408.9	16.5	4 - 16.5	4	SS	Sep-09
RW-15	1,135,239.7	1,182,744.7	408.33	409.13	409.1	16.5	4 - 16.5	4	SS	Sep-09
RW-16	1,135,285.9	1,182,726.0	407.47	408.37	408.4	16.5	4 - 16.5	4	SS	Sep-09
RW-17	1,135,204.5	1,182,787.5	408.87	409.67	409.7	16.5	4 - 16.5	4	SS	Sep-09
RW-18	1,135,160.6	1,182,762.4	408.70	409.10	409.1	16.5	4 - 16.5	4	SS	Sep-09
RW-19	1,135,187.9	1,182,769.2	409.19	409.59	409.6	16.5	4 - 16.5	4	SS	Sep-09
RW-20	1,135,218.8	1,182,799.2	408.41	409.31	409.3	16.5	4 - 16.5	4	SS	Sep-09
RW-21	1,135,223.8	1,182,755.1	409.00	409.60	409.6	16.5	4 - 16.5	4	SS	Sep-09
RW-22	1,135,257.4	1,182,754.7	408.23	409.13	409.1	16.5	4 - 16.5	4	SS	Sep-09
RW-23	1,135,110.2	1,182,803.4	408.06	408.66	408.7	16.5	4 - 16.5	4	SS	Sep-09
RW-24	1,135,054.9	1,182,889.0	408.43	409.23	409.2	16.5	4 - 16.5	4	SS	Sep-09
RW-25	1,135,219.2	1,182,874.5	408.29	409.09	409.1	16.5	4 - 16.5	4	SS	Sep-09
RW-26	1,135,171.4	1,182,832.2	408.91	409.71	409.7	16.5	4 - 16.5	4	SS	Sep-09
RW-27	1,135,254.4	1,182,892.3	407.57	408.47	408.5	16.5	4 - 16.5	4	SS	Sep-09

Final Engineering Report
Former Monarch Chemicals, Inc. Facility, Utica, New York

Table 2. Summary of Construction Details for Dual-Phase and Groundwater Extraction Wells

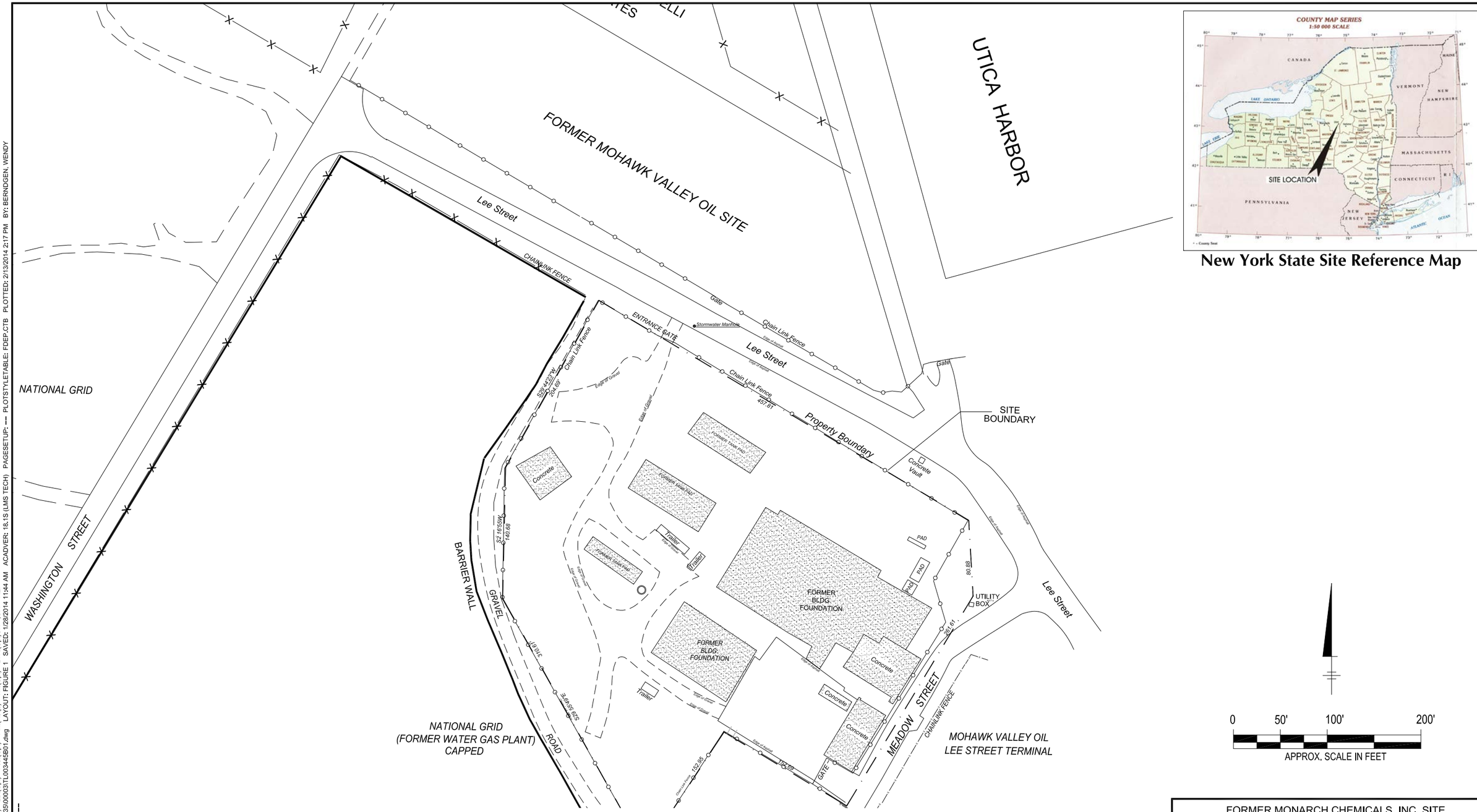
Well Identification	Northing	Easting	Top of PVC (feet NAVD88)	Top of Casing Elevation (feet NAVD88)	Ground Elevation (feet NAVD88)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Well Diameter (inches)	Casing Material	Date Installed
Groundwater Extraction Wells										
RW-1S	1,135,197.7	1,182,797.2	NA	411.22	409.3	20	5 - 20	5	PVC	May-04
IRW-1I	1,135,191.7	1,182,792.9	409.44	409.79	409.8	35	25 - 35	5	PVC	May-04
IRW-2I	1,135,368.3	1,182,810.3	405.87	406.87	406.9	35	20 - 35	5	PVC	Sep-09
IRW-3I	1,135,301.3	1,182,935.1	407.48	408.28	408.3	35	20 - 35	5	PVC	Sep-09
IRW-4I	1,135,268.8	1,182,984.4	408.18	408.78	408.8	35	20 - 35	5	PVC	Sep-09

Notes:

The coordinates and elevations shown hereon are based on the U.S. Survey Foot, and are referenced to the North American Datum of 1983 (NAD83) and projected on the New York State Plane Coordinate System (Central Zone) and to the North American Vertical Datum of 1988 (NAVD88), respectively.

RW-1 to RW-27 dual-phase extraction (DPE) wells were installed in September 2009. The RW well are typically completed to 16.5 feet bgs with 12.5 feet of stainless-steel screen.

bgs = below ground surface
SS = stainless steel



New York State Site Reference Map

0 50' 100' 200'

APPROX. SCALE IN FEET

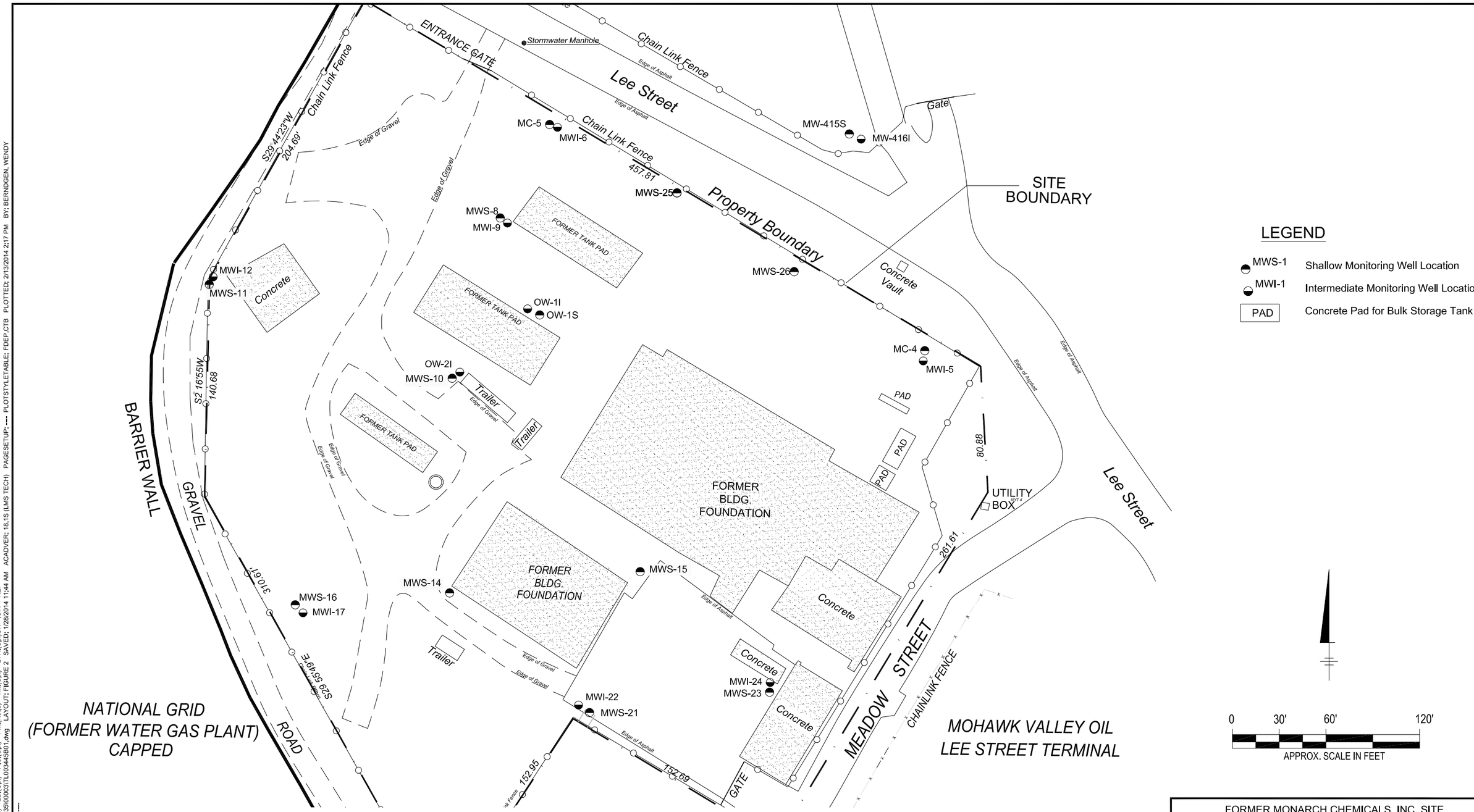
FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK
SITE NO. 6-33-030

SITE LOCATION/VICINITY MAP

ARCADIS

FIGURE 1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Tallahassee-FL\ACTIVE\TL003445\0035\00003\TL003445B01.dwg LAYOUT: FIGURE 1 SAVED: 1/28/2014 11:44 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: FDEP.CTB PLOTTED: 2/13/2014 2:17 PM BY: BERNDGEN, WENDY
XREFS: PROJECTNAME: ---



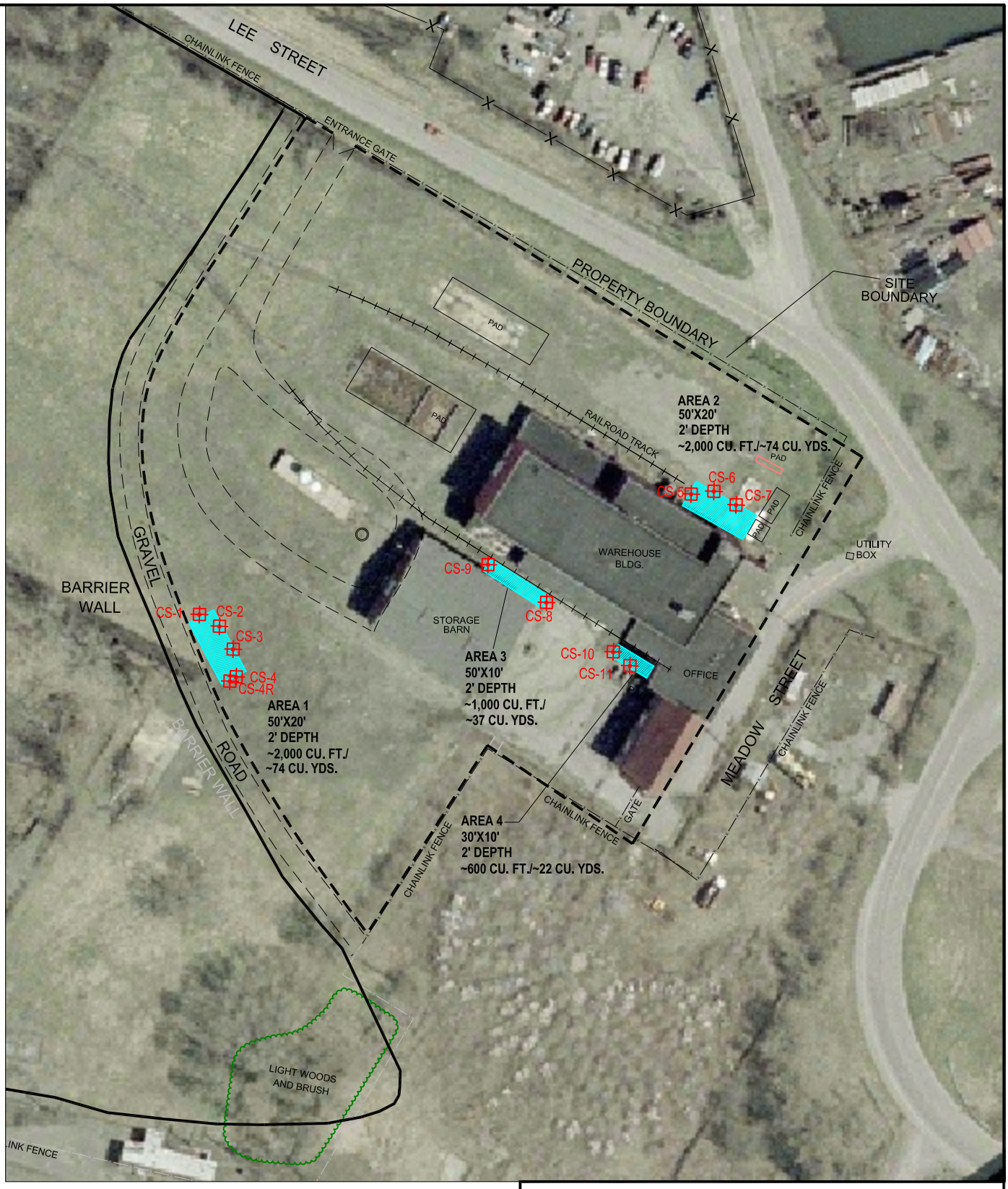
FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK
SITE NO. 6-33-030

SITE MAP

ARCADIS

FIGURE
2

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Tallahassee-FLACTIVE\003445\0035\000003\TL003445B01.dwg LAYOUT: FIGURE 2 SAVED: 1/28/2014 11:44 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---
XREFS: PROJECTNAME: ---



LEGEND

- Confirmatory Sample Locations, Dec. 2008
- Excavation Areas

CU. FT. Cubic Feet
CU. YDS. Cubic Yards

0 100
SCALE IN FEET

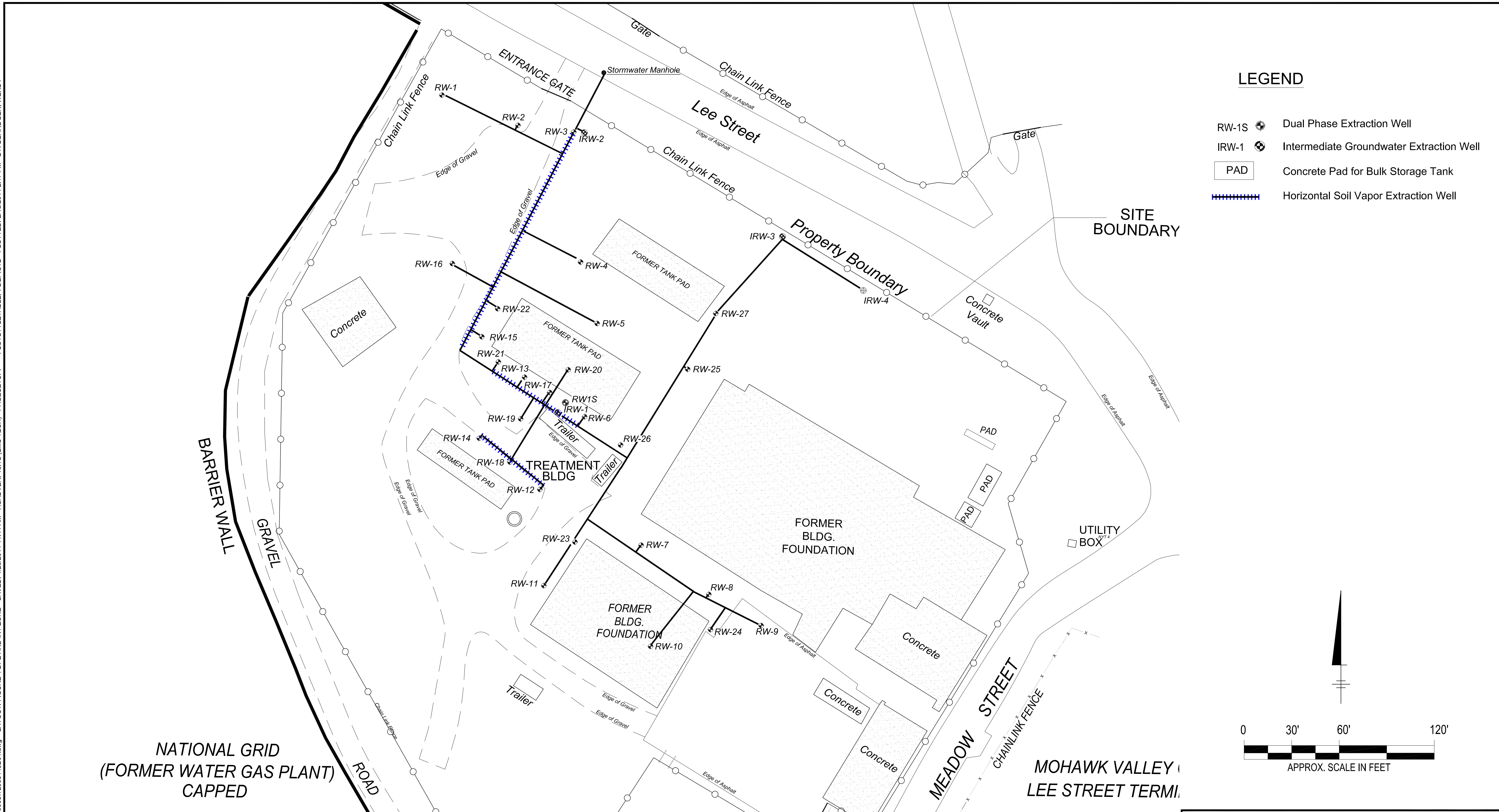
FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK
SITE NO. 6-33-030

SOIL EXCAVATION AREAS AND CONFIRMATORY SAMPLE LOCATIONS DECEMBER 2008

ARCADIS

FIGURE
3

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Tallahassee-FL\ACTIVE\00344510035\00003\3445-concentrations_11_08.dwg LAYOUT: LAYOUT1 SAVED: 2/13/2014 2:22 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTQUICK.CTB PLOTTED: 2/13/2014 2:34 PM BY: BERNDGEN, WENDY
XREFS: IMAGES: PROJECTNAME: ---
GIS_base_aerial.tif



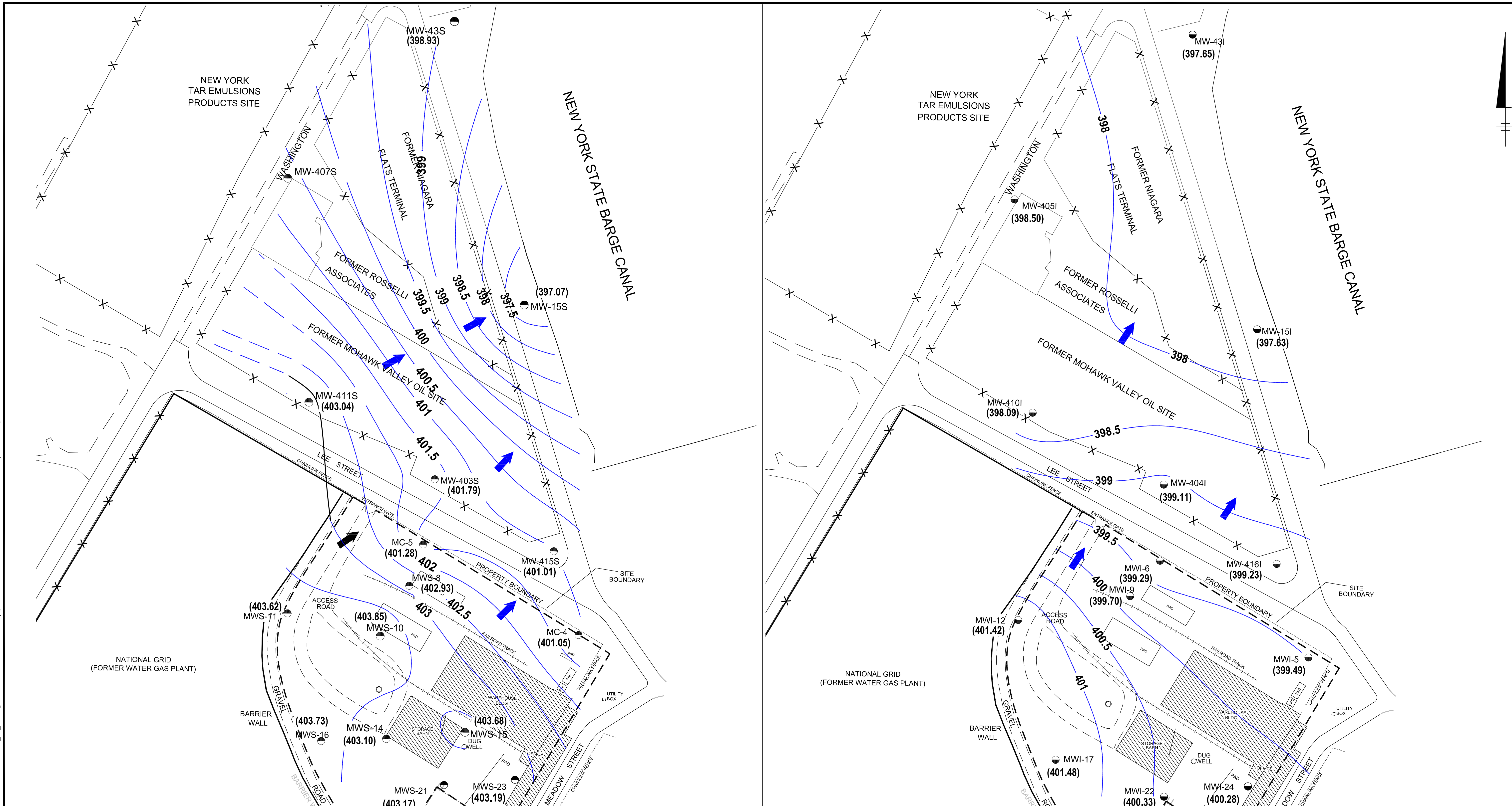
FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK
SITE NO. 6-33-030

DPE AND INTERMEDIATE ZONE GROUNDWATER EXTRACTION WELL LAYOUT

ARCADIS

FIGURE 4

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Tallahassee-FL\ACT\TL003445\0035\00003\TL003445B01.dwg LAYOUT: FIGURE 4 DPE AND INT ZONE SAVED: 1/28/2014 11:44 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: FDEP.CTB PLOTTED: 2/13/2014 2:17 PM BY: BERNDGEN, WENDY
XREFS: PROJECTNAME: ----



LEGEND

Former MCI Site

MWI-22 Deep Monitoring Well Location

MWS-14 Shallow Monitoring Well Location

(403.85) Groundwater Elevation

402.5 Groundwater Elevation Contour

Elevation Values Reported in Feet NAVD 88

0 75' 150' 300'
APPROX. SCALE IN FEET

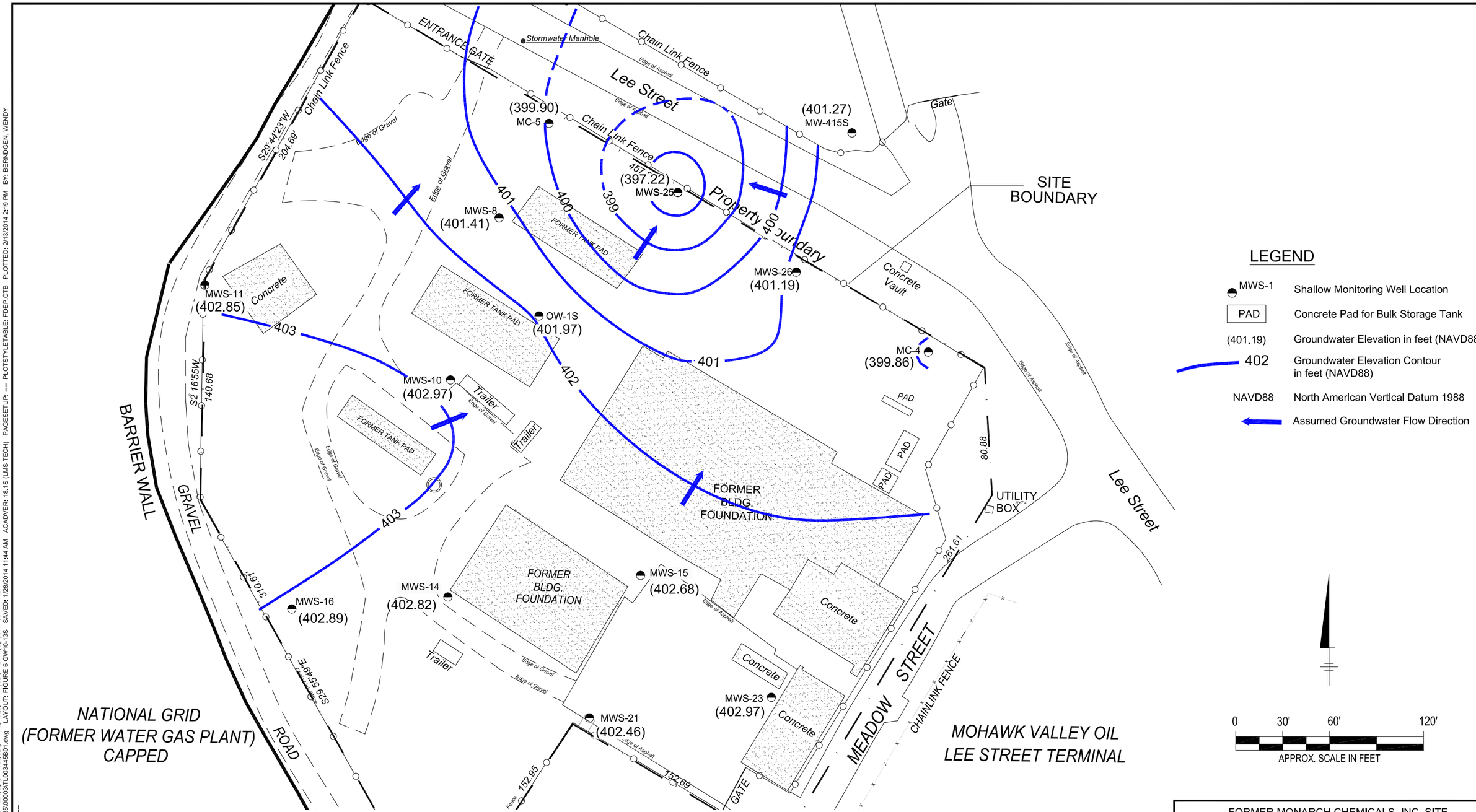
FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK
SITE NO. 6-33-030

GROUNDWATER ELEVATION CONTOUR MAPS SHALLOW AND INTERMEDIATE ZONES, SEPTEMBER 2008

ARCADIS

FIGURE
5

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Tallahassee-FL\ACT\TL003445\0035\00003\3445-concentrations_11_08.dwg LAYOUT: FIG 3 CS LOCS (2) SAVED: 2/13/2014 2:37 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: FDEP.CTB PLOTTED: 2/13/2014 2:55 PM BY: BERNDGEN, WENDY
XREFS: PROJECTNAME: ----



LEGEND

- MWS-1 — Shallow Monitoring Well Location
- PAD — Concrete Pad for Bulk Storage Tank
- (401.19) — Groundwater Elevation in feet (NAVD88)
- 402 — Groundwater Elevation Contour in feet (NAVD88)
- NAVD88 — North American Vertical Datum 1988
- Assumed Groundwater Flow Direction

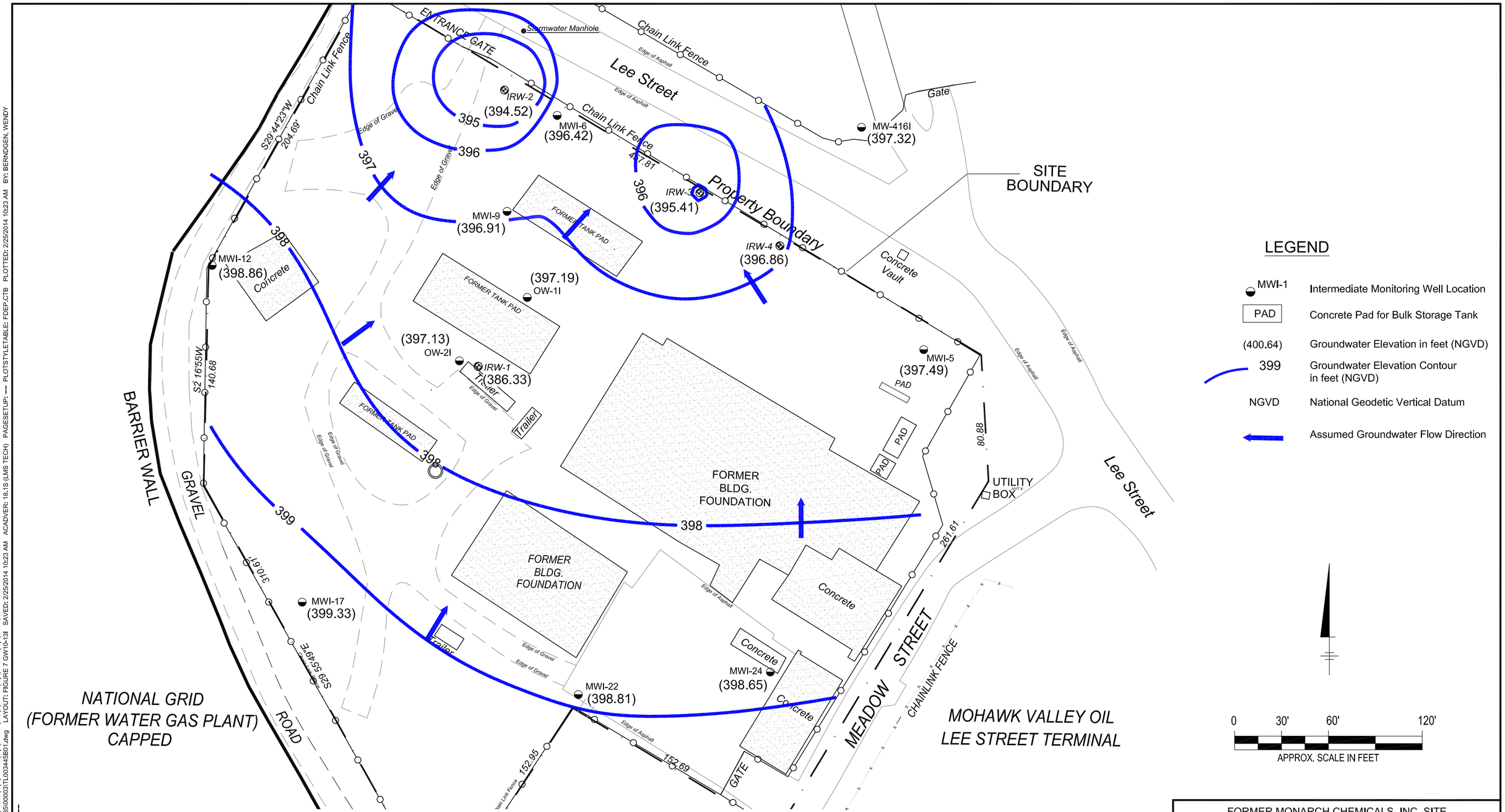
FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK
SITE NO. 6-33-030

GROUNDWATER ELEVATION CONTOUR MAP SHALLOW ZONE, OCTOBER 28, 2013

ARCADIS

FIGURE 6

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Tallahassee-FLACTIVITL003445\0035\000003\TL003445B01.dwg LAYOUT: FIGURE 6 GW10-13S SAVED: 1/28/2014 11:44 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: FDEP.CTB PLOTTED: 2/13/2014 2:19 PM BY: BERNDGEN, WENDY
XREFS: PROJECTNAME: ---



FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK
SITE NO. 6-33-030

GROUNDWATER ELEVATION CONTOUR MAP INTERMEDIATE ZONE, OCTOBER 28, 2013

ARCADIS

FIGURE 7

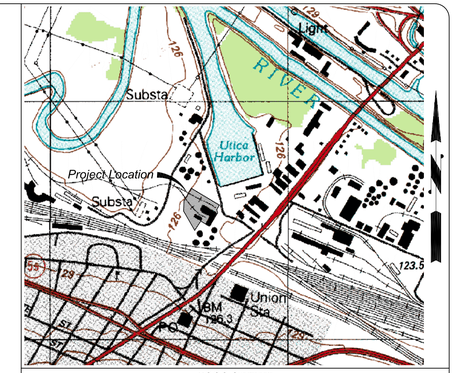
CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Tallahassee-FLA\CTT\L0034450003500003\TL0034450003\dwg LAYOUT: FIGURE 7 GW10-13I SAVED: 2/25/2014 10:23 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: FDEP.CTB PLOTTED: 2/25/2014 10:23 AM BY: BERNDGEN, WENDY
XREFS:
PROJECTNAME: ---

Appendix A

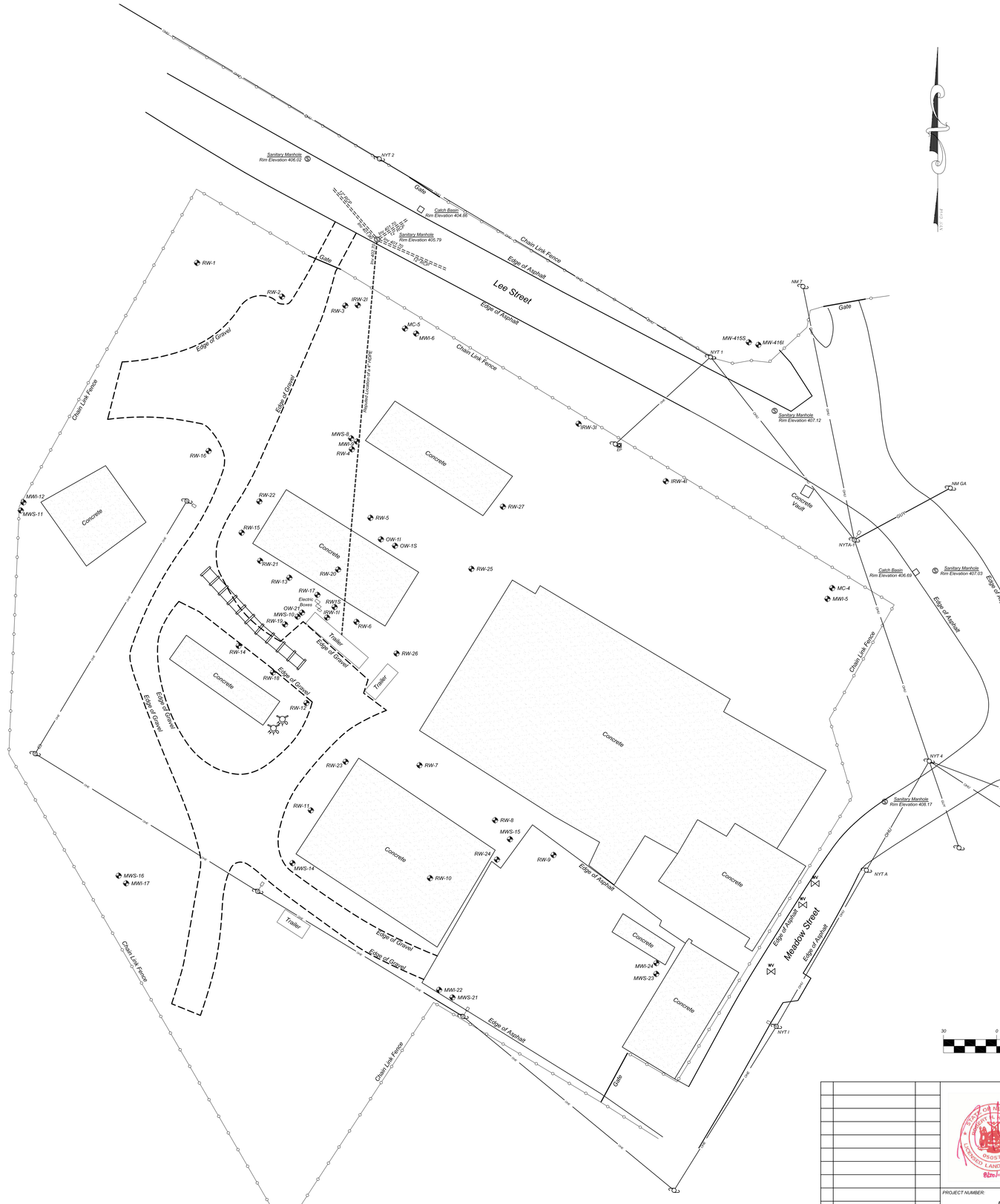
Professional Survey Map

Monitoring Well Coordinate and Elevation Table

Monitor Well ID	Northing	Easting	Top of PVC Elevation	Top of Casing Elevation	Ground Elevation
RW-1	1,135,392.2	1,182,719.5	406.87	407.67	407.7
RW-2	1,135,373.1	1,182,767.5	406.45	407.35	407.3
RW-3	1,135,368.0	1,182,803.2	406.02	406.92	406.9
RW-4	1,135,286.8	1,182,807.0	407.57	408.47	408.5
RW-5	1,135,248.1	1,182,817.4	408.96	409.86	409.9
RW-6	1,135,189.3	1,182,609.5	408.84	409.64	409.6
RW-7	1,135,108.2	1,182,845.2	408.30	409.10	409.1
RW-8	1,135,077.2	1,182,687.9	408.30	409.10	409.1
RW-9	1,135,057.5	1,182,920.9	408.55	409.35	409.4
RW-10	1,135,044.4	1,182,851.1	408.37	408.87	408.9
RW-11	1,135,082.7	1,182,783.8	408.28	408.78	408.8
RW-12	1,135,143.4	1,182,781.3	408.75	409.15	409.2
RW-13	1,135,214.2	1,182,771.6	409.24	409.94	409.9
RW-14	1,135,175.7	1,182,743.0	408.26	408.86	408.9
RW-15	1,135,239.7	1,182,744.7	408.33	409.13	409.1
RW-16	1,135,285.9	1,182,726.0	407.47	408.37	408.4
RW-17	1,135,204.5	1,182,787.5	408.87	409.67	409.7
RW-18	1,135,160.6	1,182,762.4	408.70	409.10	409.1
RW-19	1,135,187.9	1,182,769.2	409.19	409.59	409.6
RW-20	1,135,218.8	1,182,799.2	408.41	409.31	409.3
RW-21	1,135,223.8	1,182,755.1	409.00	409.60	409.6
RW-22	1,135,257.4	1,182,754.7	408.23	409.13	409.1
RW-23	1,135,110.2	1,182,803.4	408.06	408.66	408.7
RW-24	1,135,054.9	1,182,889.0	408.43	409.23	409.2
RW-25	1,135,219.2	1,182,874.5	408.29	409.09	409.1
RW-26	1,135,171.4	1,182,832.2	408.91	409.71	409.7
RW-27	1,135,254.4	1,182,892.3	407.57	408.47	408.5
RW-1S	1,135,197.7	1,182,797.2	N/A	411.22	409.3
IRW-1I	1,135,191.7	1,182,792.9	409.44	409.79	409.8
IRW-2I	1,135,368.3	1,182,810.3	405.87	406.87	406.9
IRW-3I	1,135,301.3	1,182,935.1	407.48	408.28	408.3
IRW-4I	1,135,268.8	1,182,984.4	408.18	408.78	408.8
MC-4	1,135,208.3	1,183,078.4	410.68	411.13	409.0
MWI-5	1,135,202.3	1,183,075.7	410.74	410.84	408.8
MC-5	1,135,355.1	1,182,837.0	408.05	408.35	406.3
MWI-6	1,135,352.2	1,182,843.3	407.18	407.48	406.7
MWS-8	1,135,293.0	1,182,806.5	410.12	410.27	408.0
MWI-9	1,135,291.2	1,182,809.7	409.65	409.80	407.9
MWS-10	1,135,192.2	1,182,776.3	411.69	411.82	409.5
OW-2I	1,135,194.5	1,182,778.8	411.26	411.59	409.5
MWS-11	1,135,252.2	1,182,619.8	409.76	409.96	407.8
MWI-12	1,135,256.8	1,182,621.4	409.25	409.45	407.9
MWS-14	1,135,052.9	1,182,773.4	410.71	410.41	408.1
MWS-15	1,135,066.4	1,182,696.3	411.56	411.56	409.0
MWS-16	1,135,045.8	1,182,675.1	409.76	410.11	407.8
MWI-17	1,135,041.5	1,182,679.4	409.73	409.93	407.9
MWS-21	1,134,976.9	1,182,863.8	410.85	411.10	408.7
MWI-22	1,134,981.2	1,182,856.2	410.34	410.64	408.5
MWS-23	1,134,990.3	1,182,979.0	411.67	411.77	409.6
MWI-24	1,134,996.4	1,182,979.0	411.47	411.77	409.5
OW-1S	1,135,232.2	1,182,831.3	411.58	411.73	409.6
OW-1I	1,135,235.9	1,182,823.4	411.68	411.98	410.0
MW-415S	1,135,347.3	1,183,031.3	408.05	408.15	406.2
MW-416I	1,135,345.8	1,183,036.7	408.63	408.83	405.9



U.S.G.S. Quadrangle
Utica East, New York
1" = 1000' +/-



Legend:

- Edge of Gravel
- Chain Link Fence
- Overhead Utilities (Electric, Telephone and Cabletelevision)
- Overhead Electric
- Overhead Guy Wire
- Catch Basin
- Sanitary Manhole
- Monitor Well
- Hydrant
- Water Valve
- Electric Panel
- Utility Pole
- Utility Pole with Light

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

General Notes:

1. This survey is referenced horizontally to the North American Datum of 1983, 2007 Adjustment (NAD83/07) and projected on the New York State Plane Coordinate System (Central Zone) and vertically to the North American Vertical Datum of 1988 (NAVD88).
2. North arrow as shown indicates Grid North referenced to NAD83/2007 and projected on the New York State Plane Coordinate System (Central Zone).
3. The first reference horizontal control station is a Cooperative Base Network station distinguished as UTICA, established by the New York State Department of Transportation in 1994.

   The second reference horizontal control station is a GPS Continuously Operating Reference Station (CORS) designated as "Rome CORS ARP" (NYRM). NYRM is a horizontal and vertical Control Station established by National Geodetic Survey in 2006.

   The third reference horizontal control station is a GPS Continuously Operating Reference Station (CORS) designated as "Herkimer CORS ARP" (NYHM). NYHM is a horizontal and vertical Control Station established by National Geodetic Survey in 2006.

   The reference benchmark is a brass disk set in concrete distinguished as "S31". S31 is a First Order, class I benchmark established by the Coast and Geodetic Survey in 1931. Elevation 422.03 feet (NAVD88).
4. Static GPS surveying techniques were utilized to establish horizontal and vertical control at the project site.
5. The underground utilities shown have been located from field survey information and existing drawings. The surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from the information available. This surveyor has not physically located the underground utilities.
6. The monitoring well coordinates and elevations shown hereon are based on an instrument survey completed on July 21, 2010.
7. The information shown hereon is based on an instrument survey completed on August 26, 2010.

Unauthorized alteration or addition to a survey map bearing a licensed land surveyors seal is a violation of Section 7209, Subdivision 2 of the New York State Education Law.

Only copies from the original of this survey marked with an original of the surveyor's inked seal or his embossed seal shall be considered to be valid and true copies.

REV	DESCRIPTION	DATE

DRAWN: N.D.G.
CHECKED: R.H.K.
SCALE: 1" = 30'
DATE: 8/30/10
PROJECT NUMBER: UK320-07-10

Map Showing Existing Conditions Former Monarch Chemicals, Inc.

City of Utica
County of Oneida
State of New York

Thew Associates LAND SURVEYORS
www.ThewAssociates.com
P.O. Box 463
6431 US Highway 11
Canton, New York 13617
T: 315/386-2776
F: 315/386-1012
9478 River Road
Marcy, New York 13403
T: 315/733-7278
F: 315/797-1957

Copyright © 2010 Thew Associates PE-LS, PLLC - All Rights Reserved

Appendix B

Declaration of Restrictions

JCI
Jones Chemicals Inc.

July 21, 2003

Anthony Quartararo, Esq.
New York State Department of Environmental Conservation
625 Broadway, 14th Floor
Albany, New York 12233-5500

Re: Monarch Chemicals, Inc., Utica, New York
Order on Consent, Index No. A6-0449-0107, Site Code #6-33-030

Dear Mr. Quartararo:

As required by Section X, Paragraph A.1 of the above referenced Order on Consent, enclosed please find a certified copy of the Declarations of Covenants and Restrictions.

Please contact me at (585) 538-2314 if you have any questions or require additional information.

Very truly yours,

MONARCH CHEMICALS, INC.

Timothy J. Gaffney
Executive Vice President

cc: Kevin Sarnowicz (NYSDEC)
Sandra LeBarron (NYSDEC)
Gary Litwin (NYSDOH)
Greg Rys (NYSDOH)
Shekhar Melkote (LFR Levine Fricke)

100 Sunny Sol Boulevard • Caledonia, New York 14423 • *telephone:* 585.538.2314 • *facsimile:* 585.538.2316
Corporate Offices • Sarasota, FL • *Branch Locations* • Warwick, NY • Barberton, OH • Riverview, MI • Merrimack, NH • Charlotte, NC
Ft. Lauderdale, FL • Jacksonville, FL • Beech Grove, IN • Milford, VA • Tacoma, WA • Torrance, CA
www.jcichemicals.com

*** DO NOT DETACH ***

Oneida County Clerk's Office

Recording Page

Receipt #:	88482	--------FEES--------	
Instrument #:	2003-014260	Recording and Filing:	36.00
Date:	06/18/2003	Transfer Tax:	0.00
Time:	09:26A	Basic Tax:	0.00
Doc Type:	DECLARATION	Additional Tax:	0.00
1st OR:	JCI JONES CHEMICALS IN	Special Tax:	0.00
1st EE:	X	Withheld:	0.00
Town:	-	Total:	36.00
Pages:	3		
Serial #:	-	--------MORTGAGE TAX-----	
Employee ID:	JAB	Amount Taxed:	0.00
Transfer Tax #:		--------TRANSFER TAX-------	
		Consideration Amount:	0.00

State of New York
County of Oneida

*** WARNING - **I hereby certify that the within and foregoing was recorded in the Oneida County Clerk's Office, State of New York.**

This sheet constitutes the Clerks endorsement required by Section 316 of the Real Property Law of the State of New York.

Richard D. Allen
County Clerk

****
* *** DO NOT DETACH *** *
****

Richard D. Allen, Oneida County Clerk

2003-014260
06/18/2003 09:26AM
Page: 1 of 3
DEC

Declaration of Restrictions,

WHEREAS, JCI Jones Chemicals, Inc., a corporation organized and existing under the laws of the State of New York with its principal place of business at 808 Sarasota Quay, Sarasota, Florida 34236 and successor in interest to Monarch Chemicals, Inc., is the owner of the following described property.

ALL that tract or parcel of land situate in the City of Utica, County of Oneida and State of New York, bounded and described as follows: Commencing at a point where the westerly line of Meadow St. meets the northerly line of Lee St., and on the boundary line between the lands of Henry C. Ballou, dec'd. and the lands appropriated for the New York State Barge Canal terminal; thence N. 5°5" W. 79.21 ft. to an iron pipe driven in the grounds; thence N. 58° 10' W. 586.05 ft. to an iron pipe driven in the ground; thence S 31° 58' W. 407.63 ft. to a rail monument; thence S. 59° 15' E. 264.54 ft. to an iron fence post; thence S. 31° 21' 30" W. 115.22 ft. to an iron pipe driven in the ground; thence S. 57° 55' 30" E. 220.06 ft. to an iron pipe driven in the ground; thence N. 33° 43'E. 195.12 ft. to an iron pipe driven in the ground; thence S. 57° 12' E. 141.33 ft. to the westerly line of meadow St.; thence N. 32° 6' 30" E. 262.89 ft. along the westerly line of Meadow St. to the point or place of beginning.

BEING the same premises conveyed to Monarch Chemicals, Inc. by warranty deed from Kellogg Lumber, Inc. dated October 27, 1966 and recorded in the Oneida County Clerk's office on November 28, 1966, in libre 1849 of deeds at page 175.

WHEREAS, it is the desire and intention of the owner to provide for restricted use of the future sale of the property described above and to impose on it restrictions for the benefit of future owners and for all surrounding lands and the future owners of those lands;

NOW, THEREFORE, the owner hereby declares that all of the property described above is held and shall be held, conveyed, hypothecated or encumbered, leased, rented, used, occupied, and improved subject to the following limitations, restrictions, conditions, and covenants, all of which are declared and agreed to be in furtherance of a plan for the improvement and sale of the land and are established and agreed upon for the purpose of enhancing and protecting the value, desirability and current use of the lands and every part thereof. All the limitations, restrictions, conditions and covenants shall run with the land and shall be binding on all parties having or acquiring any right, title or interest in the described lands or any part thereof.

NO building shall be erected, altered, placed or permitted to remain on any of the above described property other than a commercial or industrial building, excluding day care, child care and medical treatment facilities, and no part of the above-described premises shall be used for any purpose other than industrial or commercial, excluding day care, child care and medical treatment facilities, and any lots into which the said premises may hereafter be subdivided shall be known and described as lots for commercial or industrial purposes only, excluding day care, child care and medical treatment facilities, and only industrial or commercial structures may be erected, altered, placed, or permitted to remain on any such lot or any part of the aforesaid described premises.

2003-014260
06/18/2003 09:26AM
Page: 2 of 3
Richard D. Allen, Oneida County Clerk DEC

IF soil caps (2 feet of soil and vegetative soil cover) are found on the above-described property, then excavation of the soil so capped shall not be allowed below the level of the soil cap.

THE Owner of the Site shall prohibit excavation at the site of more than two feet below grade without first obtaining the written approval of the New York State Department of Environment Conservation.

In addition to the foregoing, at no time now or in the future, shall any use be made of any groundwater located upon, in, or under the described premises.

THE terms of an Order on Consent (Index No. A6-0449-0107), entered into between JCI/Jones Chemical and the New York State Department of Environmental Conservation shall be binding upon all future owners of the Site. The Owner, and its successors and assigns, consent to the enforcement of the Order on Consent (Index No. A6-0449-0107), by the New York State Department of Environmental Conservation and such Owners hereby covenant not to contest the authority of the Department of Environmental Conservation to seek enforcement of the Order on Consent (Index No. A6-0449-0107).

IN WITNESS WHEREOF, the owner has set his hand and seal this 4 day of June, 2003.

JCI JONES CHEMICALS, INC.

By: Timothy J. Gaffney
Timothy J. Gaffney
Executive Vice President

In the presence of:

State of New York)
) ss.
County of Livingston)

2003-014260
06/18/2003 09:26AM
Page: 3 of 3
Richard D. Allen, Oneida County Clerk DEC

On the 4th day of June in the year 2003, before me, the undersigned personally appeared Timothy J Gaffney personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s) or the person upon behalf of which the individual(s) acted, executed the instrument.

Evelyn M Johnson
Notary Public

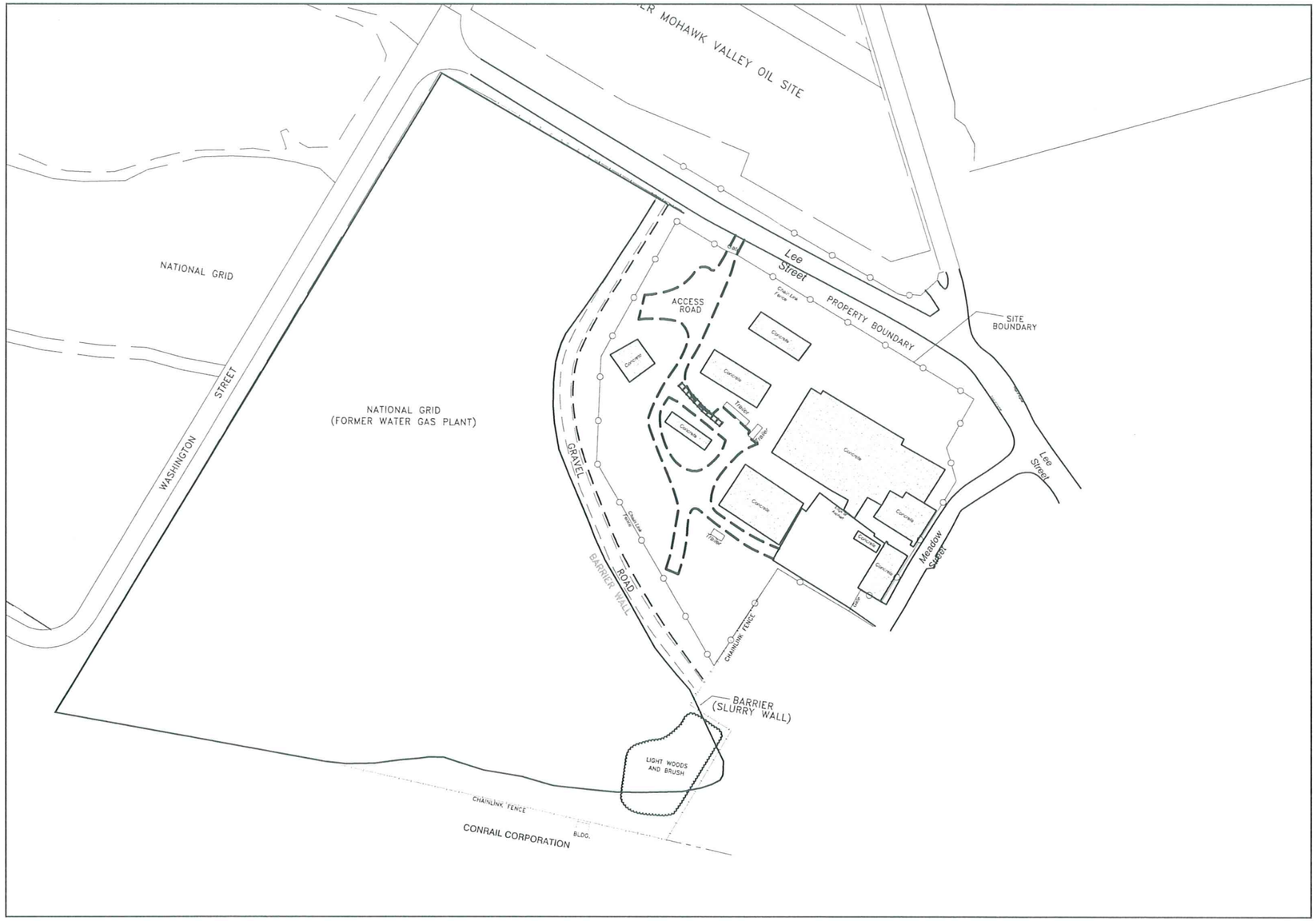
Evelyn M. Johnson
Notary Public, State of New York
Qualified in Livingston County
Commission Expires 07/20/05

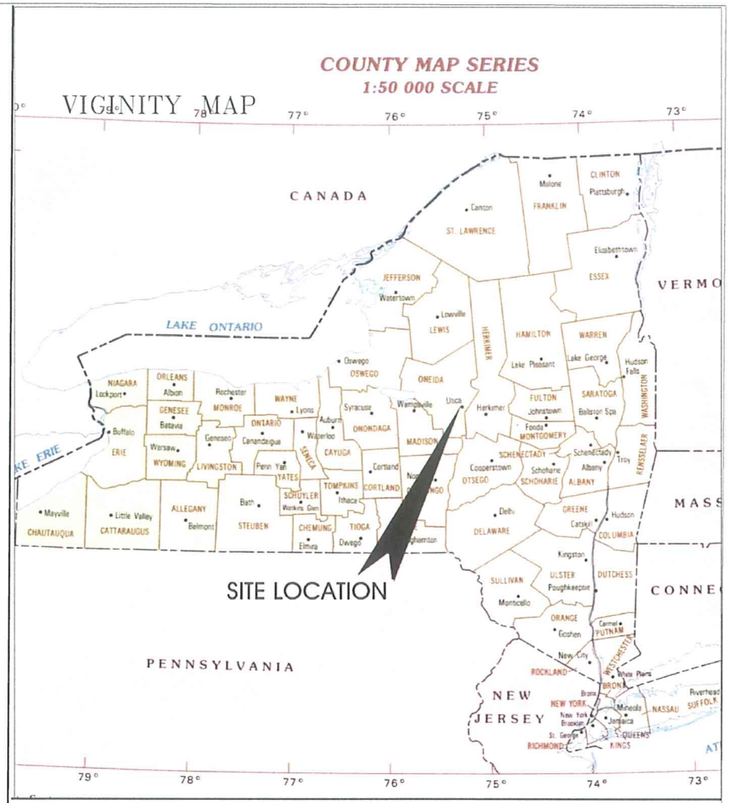
JCI Jones Chemical
100 Sunny Sol Blvd.
Caledonia, NY 14423

Appendix C

Final Engineering Drawings

AS-BUILT DRAWINGS FOR THE DUAL-PHASE EXTRACTION AND HYDRAULIC CONTROL SYSTEMS





INDEX OF DRAWINGS

SHEET TITLE	SHEET NO.
TITLE SHEET, VICINITY MAP, AND INDEX OF DRAWINGS	1
GENERAL NOTES	2
SITE MAP	3
GROUNDWATER EXTRACTION AND DUAL-PHASE EXTRACTION WELLS LAYOUT	4
GROUNDWATER EXTRACTION AND DUAL-PHASE EXTRACTION WELLS DETAILS	5
TREATMENT BUILDING LAYOUT	6
DUAL-PHASE EXTRACTION WELLS STUB-UP AND MANIFOLD DETAIL	7
PIPING TRENCH DETAILS	8
REMEDIAL SYSTEM P&ID	9
REMEDIAL SYSTEM P&ID	10
PROCESS AND INSTRUMENTATION LEGEND	11
SEWER DISCHARGE LOCATION DETAIL	12
ROADWAY CUT AND REPAIR DETAIL	13

Former Monarch Chemicals, Inc. Site
37 Meadow Street
Utica, New York

SEAL
4/15/11
KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

TITLE SHEET, VICINITY MAP, AND INDEX OF DRAWINGS

SCALE NTS
DATE 09/14/2010
PROJECT NO. 0040344511
SHEET 1

J:\graphics\2009\3445 jones utica\REMEDIAL DWGS 4-2011\3445cover.dwg

GENERAL NOTES

1. CONTRACTOR RESPONSIBLE FOR OBTAINING AND COMPLYING WITH ALL REQUIRED PERMITS INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION AND ELECTRICAL ACTIVITIES. CONTRACTOR EXPECTED TO COMPLY WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS.
2. CONTRACTOR RESPONSIBLE FOR COMPLIANCE WITH THE LATEST NATIONAL ELECTRIC CODE (NEC) NFPA 70, NFPA 30 AND 30A AND APPROPRIATE CITY, COUNTY, STATE, AND FEDERAL ELECTRICAL CODES.
3. CONTRACTOR RESPONSIBLE FOR PROVIDING SAFE ACCESS TO SITE AT ALL TIMES.
4. CONTRACTOR RESPONSIBLE FOR PROVIDING LIGHTED BARRICADES AND OTHER SAFETY EQUIPMENT AS NECESSARY TO PROTECT THE PUBLIC 24 HOURS A DAY DURING CONSTRUCTION. BARRICADES TO BE IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (MUTCD), FEDERAL HIGHWAY ADMINISTRATION (FHA).
5. CONTRACTOR ACCEPTS LIABILITY AND IS RESPONSIBLE FOR REPAIR AS NECESSARY TO ORIGINAL CONDITION OF ANY AND ALL DAMAGED UTILITIES, STRUCTURES, PAVEMENT, CURBS, AND VEGETATED AREAS; VEGETATED AREAS TO INCLUDE TREES, SHRUBS, AND GRASS.
6. CONTRACTOR TO CLEAN SITE TO ORIGINAL CONDITION, ACCEPTABLE TO LFR.
7. CONTRACTOR'S WORKERS SHALL CONFORM WITH OSHA REGULATIONS CFR 29, PART 1910: 120, HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE.
8. THE FOLLOWING IS A LIST OF MATERIALS AND EQUIPMENT FOR WHICH MANUFACTURER'S OR SUPPLIER'S DATA SHEETS MUST BE SUBMITTED PRIOR TO COMMENCEMENT OF WORK:

   CONCRETE
   PIPING AND VALVES
   APPURTENANCES
   ANCHOR BOLTS AND GROUTING SYSTEMS FOR PIPING SUPPORTS
   PIPE SUPPORTS

9. OUTSIDE WORK TO BE PERFORMED DURING NORMAL BUSINESS HOURS (7:00am – 5:00pm, MONDAY THROUGH FRIDAY) UNLESS SPECIFIC WRITTEN APPROVAL IS GIVEN BY LFR. CONTRACTOR TO COORDINATE WITH OWNER AND LFR TO CONDUCT INSIDE WORK.
10. ALL WORK UNDER THIS CONTRACT SHALL BE PERFORMED IN A MANNER WHICH DOES NOT DISRUPT THE OWNERS' NORMAL BUSINESS ACTIVITIES.
11. CONTRACTOR MUST PREPARE A SITE SPECIFIC HEALTH AND SAFETY PLAN.
12. CONTRACTOR TO PROVIDE RESTROOM FACILITY DURING CONSTRUCTION ACTIVITIES
13. HEALTH AND SAFETY REQUIREMENTS MUST BE FOLLOWED INCLUDING APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT.
14. THE CONTRACTOR SHALL HAVE LEVEL C PERSONNEL PROTECTION EQUIPMENT AVAILABLE FOR ALL WORKERS ON SITE AT ALL TIMES DURING CONSTRUCTION. THIS INCLUDES BUT IS NOT LIMITED TO CARTRIDGE RESPIRATORS AND TYVEK SUITS.

ELECTRICAL

1. ALL ABOVEGROUND ELECTRICAL EQUIPMENT AND APPURTENANCES TO BE HOUSED IN GALVANIZED AND FLEX CONDUIT MEETING REQUIREMENTS IN NO. 2, GENERAL NOTES.
2. CONTRACTOR TO SUBMIT PROPOSED ELECTRICAL LAYOUT FOR EQUIPMENT AND APPURTENANCES TO ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO SUBCONTRACT WITH LOCAL POWER COMPANY TO PROVIDE 480 VOLT THREE PHASE AND 120/240 VOLT SINGLE PHASE SERVICE. CONTRACTOR RESPONSIBLE FOR PROVIDING CORRECT AMPERAGE REQUIRED FOR EQUIPMENT SPECIFIED IN THE TREATMENT BUILDING.
4. CONTRACTOR RESPONSIBLE FOR PROVIDING ALL ELECTRIC APPURTENANCES ASSOCIATED WITH POWER SERVICE, INCLUDING, BUT NOT LIMITED TO, POWER POLE, METER BOX, AND BREAKER BOX. CONTRACTOR TO PROVIDE LOCKABLE ON/OFF SWITCH ON POWER POLE.
5. ALL ELECTRICAL EQUIPMENT SHALL BE UNDERWRITERS LABORATORY (UL) LISTED.

CIVIL

1. CONTRACTOR TO FIELD VERIFY ALL HORIZONTAL AND VERTICAL DIMENSIONS AND LOCATIONS; ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER PRIOR TO CONSTRUCTION.
2. ELEVATION POINTS AND CONTOURS ARE NOT SHOWN.
3. CONTRACTOR RESPONSIBLE FOR VERIFYING LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION ACTIVITIES.
4. CONTRACTOR TO VERTICAL SAW CUT ASPHALT/CONCRETE PAVEMENT AT TRENCH/VAULT LOCATIONS PRIOR TO EXCAVATION.
5. CONTRACTOR RESPONSIBLE FOR OBTAINING ALL PERMITS NECESSARY FOR TRENCHING.
6. SLAB SUBGRADE AND PAVEMENT SUBGRADE, SHALL BE COMPACTED TO 98% ASTM D698 MAX. DENSITY.
7. MPE, GROUNDWATER EXTRACTION WELLS ARE TO BE INSTALLED BY LFR. CONTRACTOR TO COMPLETE WELL HEADS AS SHOWN.
8. CONTRACTOR SHALL INSTALL A LINED DECONTAMINATION AREA WITH A SUMP AT A LOCATION APPROVED BY LFR. DECONTAMINATE ALL EQUIPMENT WITH A PRESSURE SPRAYER UPON MOBILIZATION TO THE SITE. DECONTAMINATE ALL EQUIPMENT PRIOR TO LEAVING THE SITE, INCLUDING PICKUP TRUCKS OR ANY ON SITE VEHICLE. PUMP FLUIDS INTO 55 GALLON DRUMS, ASSUME 20 55 GALLON DRUMS WILL BE USED.
9. CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EROSION CONTROL MEASURES REQUIRED BY THE COUNTY AND STATE.

MECHANICAL

1. CONTRACTOR RESPONSIBLE FOR SUPPLY AND ASSEMBLY OF ALL PIPING AND APPURTENANCES FROM WELL HEADS TO TREATMENT SYSTEM BUILDINGS.
2. ALL LIQUIDS PIPING INCLUDING APPURTENANCES TO BE HYDROSTATICALLY PRESSURE TESTED FOR ONE HOUR @ 100 PSI. ALL DPE PIPING INCLUDING APPURTENANCES SHALL BE PRESSURE TESTED @ 30 PSI FOR ONE HOUR. ALL TESTING SHALL BE WITNESSED BY LFR AND LFR SHALL BE NOTIFIED 24 HOURS PRIOR TO TESTING.
3. ALL PIPING AND ELECTRICAL CONDUITS ON OR IN EXISTING FACILITY BUILDINGS TO BE SECURED TO SLAB OR WALL WITH UNISTRUT AND STRAPS OR EQUIVALENT. MAXIMUM UNSUPPORTED LENGTH OF PIPING SHALL BE LESS THAN 6 FEET.
4. EQUIPMENT/APPURTENANCES ON DETAILS ARE GENERIC ONLY. SIZE OF UNITS MAY BE DIFFERENT THAN SHOWN.
5. ALL APPURTENANCES, CONNECTIONS, GASKETS, SEALS ETC. TO BE SOLVENT RESISTANT. LEVEL AND GROUT ALL SKIDS AS NECESSARY FOR PROPER SUPPORT.
6. CONTRACTOR TO PROVIDE ALL PIPE FITTINGS NOT SHOWN (REDUCERS, BUSHINGS, ETC.)

CONCRETE

1. CONTRACTOR TO REPAIR OR REPLACE ANY CONCRETE DAMAGED OR REMOVED.
2. CONCRETE TO MATCH THE THICKNESS, ELEVATION, AND TEXTURE OF CONCRETE DAMAGED OR REMOVED.
3. ALL CONCRETE IS TO BE TROWLED AND FLOATED LEVEL TO MATCH EXISTING SURFACE TEXTURE.
4. ALL CONCRETE IS TO BE 4000 PSI FIBER REINFORCED TYPE I. IN ACCORDANCE WITH ASTM STANDARD SPECIFICATION FOR PORTLAND CEMENT DESIGNATION C150
5. CONSTRUCTION JOINTS TO BE 10 FT O.C. AT EXISTING CONCRETE.
6. USE 6x6 #10 WELDING MESH IN CONCRETE

SEAL
4/5/11
KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

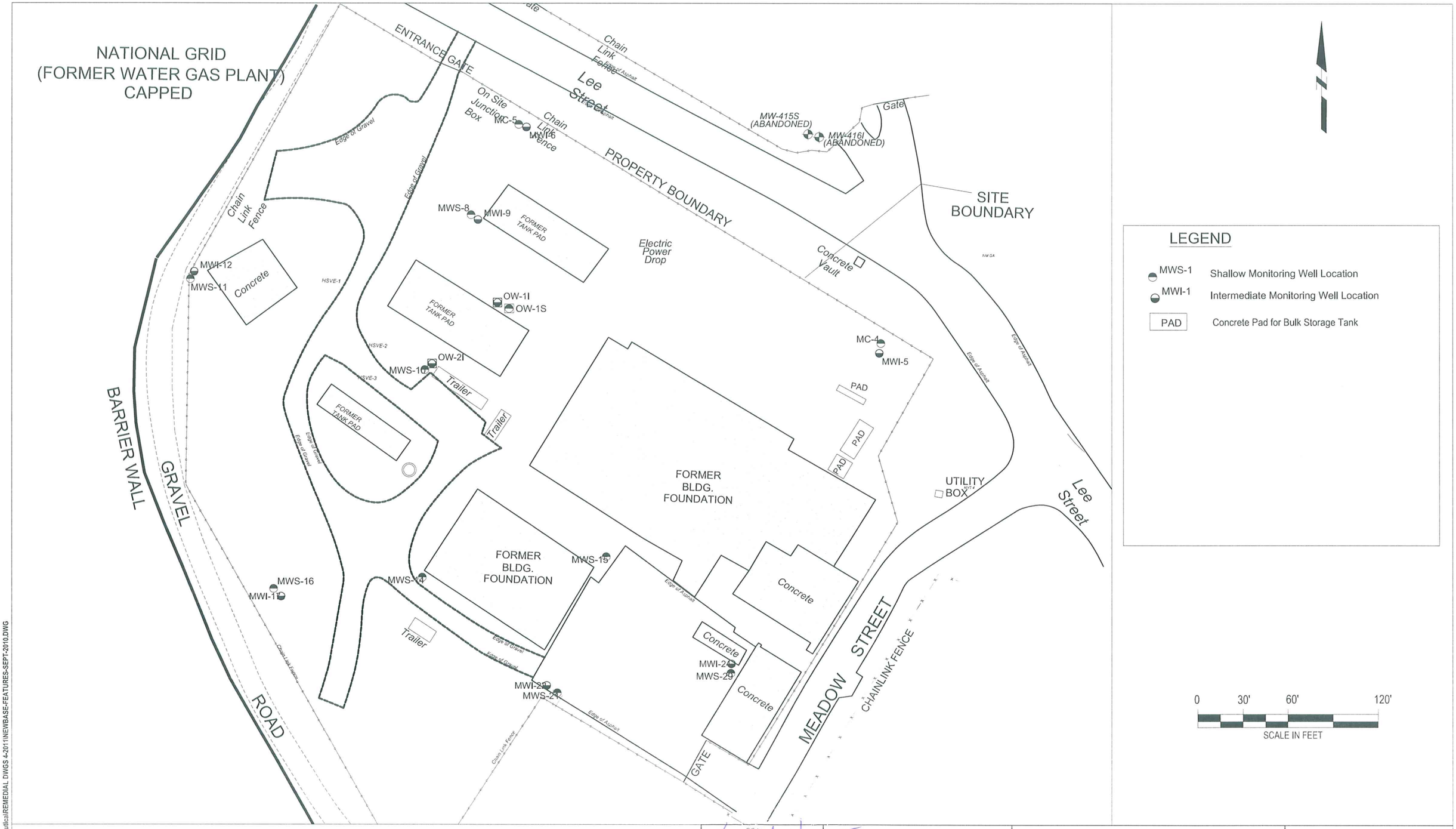
ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

GENERAL NOTES

SCALE NTS
DATE 09/14/2010
PROJECT NO. 0040344511
SHEET 2

J:\graphics 2009\3445 jones utica\REMEDIAL DWGS 4-2011\3445notes.dwg



LEGEND

- MWS-1 — Shallow Monitoring Well Location
- MWI-1 — Intermediate Monitoring Well Location
- PAD — Concrete Pad for Bulk Storage Tank

0 30' 60' 120'

SCALE IN FEET

J:\graphics 2009\3445 jones utica\REMEDIAL DWGS 4-2011\NEWBASE-FEATURES-SEPT-2010.DWG

SEAL

4/5/11

KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

SITE MAP

SCALE	IN FEET
DATE	09/16/2010
PROJECT NO.	0040344511
SHEET	3

NATIONAL GRID
FORMER WATER GAS PLANT)
CAPPED

ENTRANCE GATE

Onsite Junction Box

12" ROP

12" RCP

Sanitary Manhole

12" RCP

Chain Link Fence

Edge of Asphalt

Lee Street

Edge of Asphalt

Gate

Chain Link Fence PROPERTY BOUNDARY

Sanitary Manhole
Rim Elevation 407.12

Gate

B

Edge of Gravel

ACCESS
ROAD

Chain
Link
Fence

Edge of Gravel

FORMER
TANK PAD

Concrete

Electric
Power
Drop

Concrete
Vault

Catch Basin
Rim Elevation 406.69

RW-1
RW-2
RW-3
IRW-2I
IRW-3I
IRW-4I
RW-4
RW-5
RW-16
RW-22
HSVE-1
RW-15
RW-27
RW-25
RW-21
RW-13
RW-20
HSVE-2
RW-17
RW1S
IRW-1I
RW-6
RW-19
HSVE-3
RW-14
RW-18
RW-12
RW-26
RW-23
RW-7
RW-11
RW-8
RW-24
RW-9
RW-10

FORMER
TANK PAD

TREATMENT
BLDG

Trailer

Trailer

FORMER
BLDG.
FOUNDATION

FORMER
BLDG.
FOUNDATION

PAD

PAD

PAD

DUG
WELL

Edge of Asphalt

Concrete

Concrete

Trailer

Edge of Gravel

Edge of Gravel

Edge of Gravel

Edge of Gravel

BARRIER WALL

GRAVEL

Chain Link Fence

UT
BO

Sanitary Manhole
Rim Elevation 408

STREET

LINK FENCE

LEGEND

RW-1	Recovery Well
RW1S	Shallow Groundwater Extraction Well
IRW-1I	Intermediate Groundwater Extraction Well
	Trench Sections with Horizontal SVE Piping
PAD	Concrete Pad for Bulk Storage Tank

0 25' 50' 100'
SCALE IN FEET

SEAL
4/5/11
KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

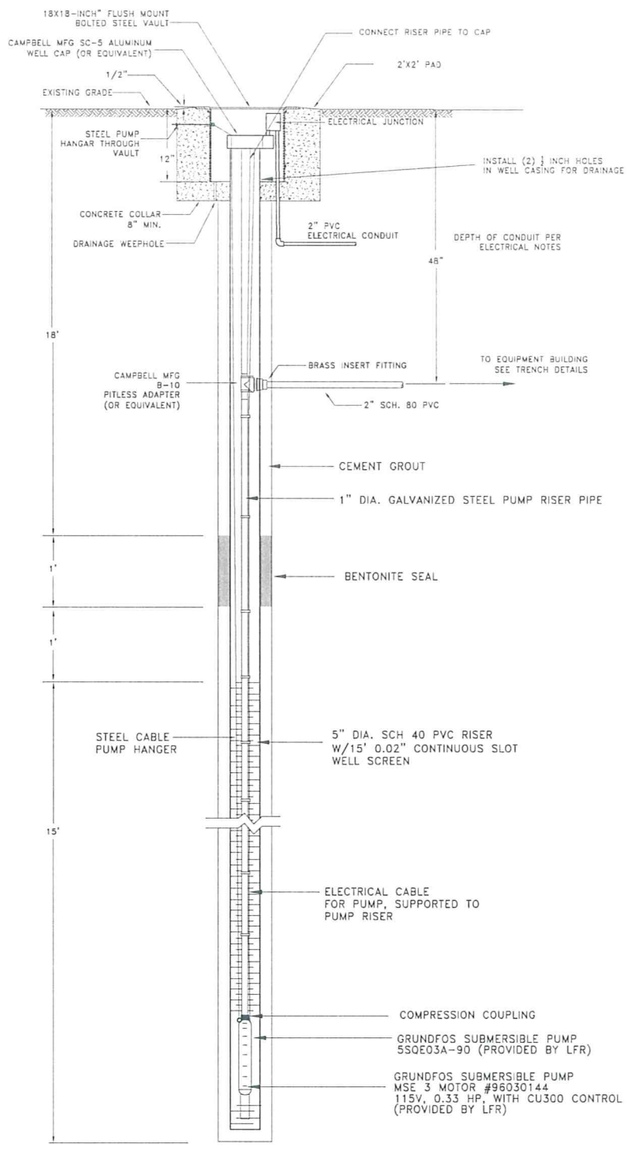
ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

SITE MAP WITH DUAL-PHASE AND
GROUNDWATER EXTRACTION WELLS

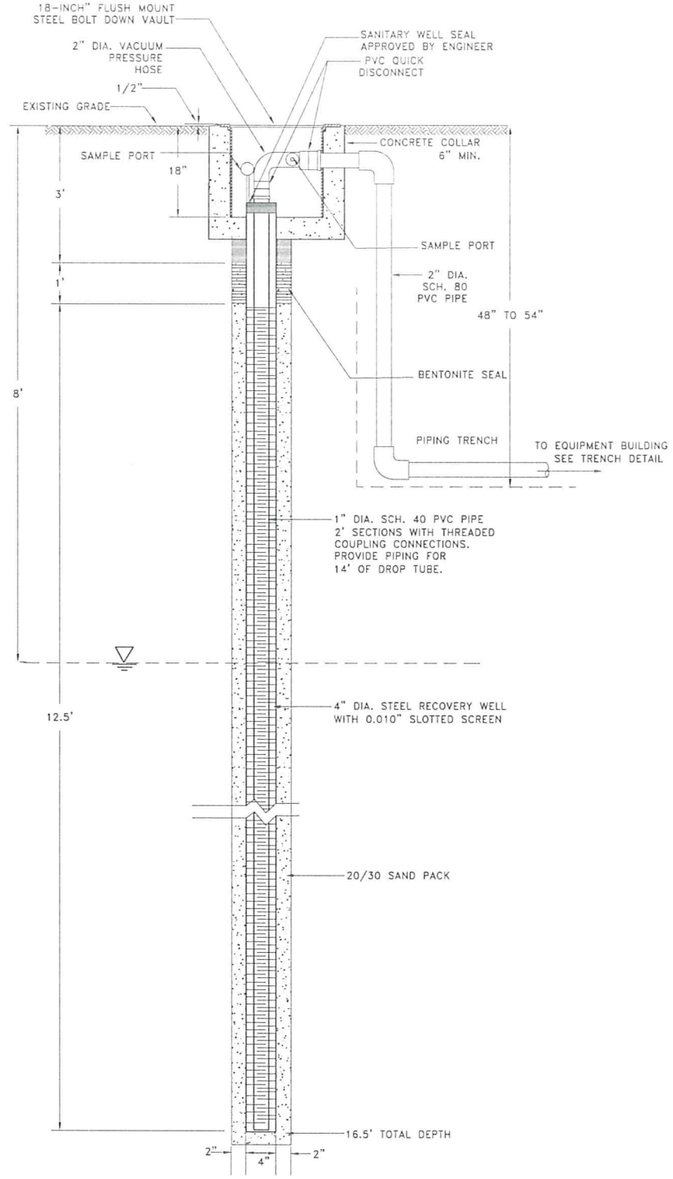
SCALE IN FEET
DATE 09/16/2010
PROJECT NO. 0040344511
SHEET 4

J:\graphics 2009\3445 jones utica\REMEDIAL DWGS 4-2011\NEWBASE-FEATURES-SEPT-2010.DWG



INTERMEDIATE GROUNDWATER EXTRACTION WELL AND VAULT DETAIL

NOT TO SCALE



TYPICAL DUAL-PHASE WELL AND VAULT DETAIL

NOT TO SCALE

NOTES

- THE FOLLOWING REQUIRE ENGINEERS APPROVAL PRIOR TO INSTALLATION:
  - QUICK DISCONNECTS (CAM AND LOCK FITTINGS)
  - REINFORCED HOSE
  - SAMPLE PORT
- WELLS INSTALLED UNDER SEPARATE CONTRACT.
- CONTRACTORS RESPONSIBLE FOR ALL OTHER WORK.

SEAL

4/15/11

KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

GROUNDWATER EXTRACTION AND DUAL-PHASE EXTRACTION WELL DETAILS

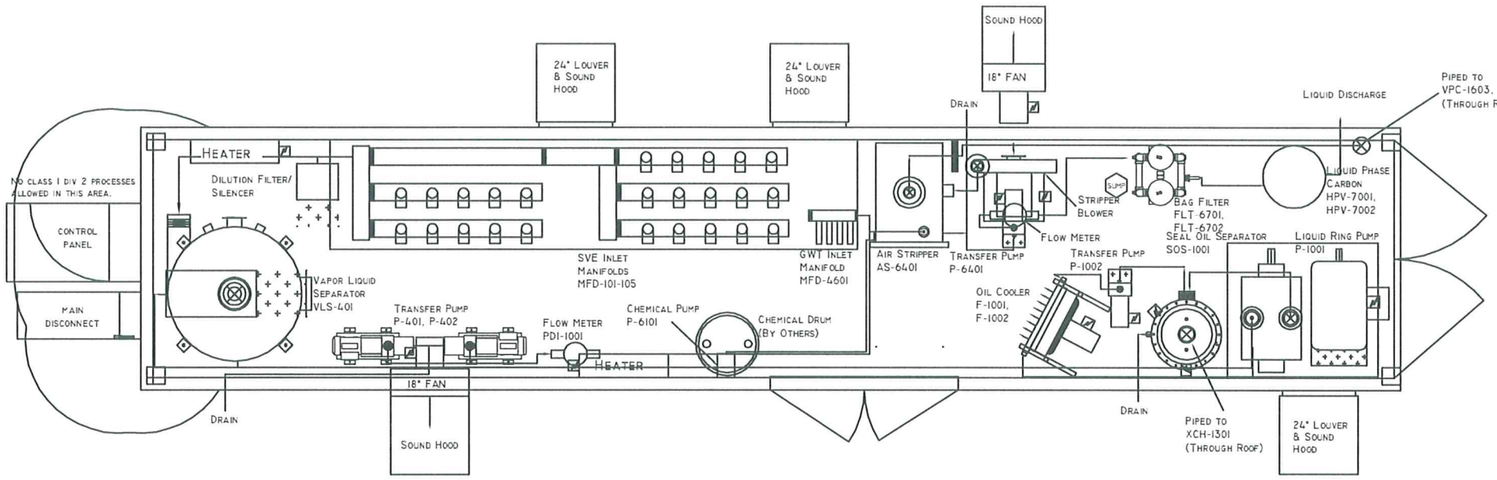
SCALE NTS

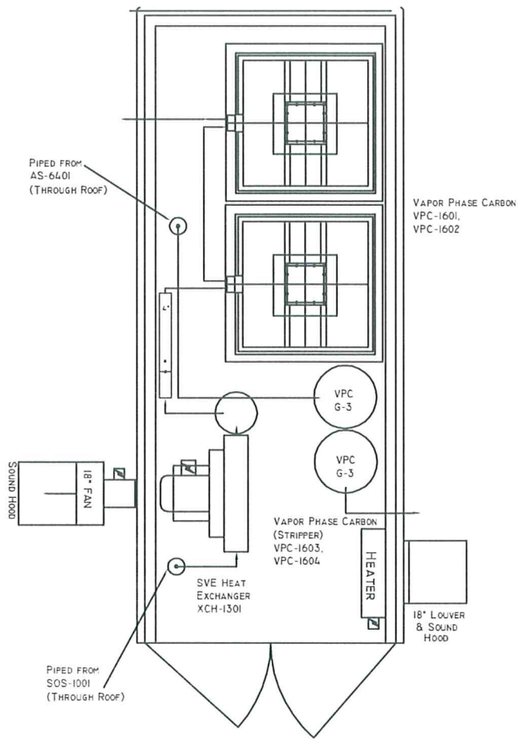
DATE 09/14/2010

PROJECT NO. 0040344511

SHEET 5

J:\graphics 2009\3445 jones utica\remedial dwgs 4-2011\utica-trench_ren_05_09.dwg





NOT TO SCALE

SEAL

4/5/11

KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

TREATMENT SYSTEM LAYOUT

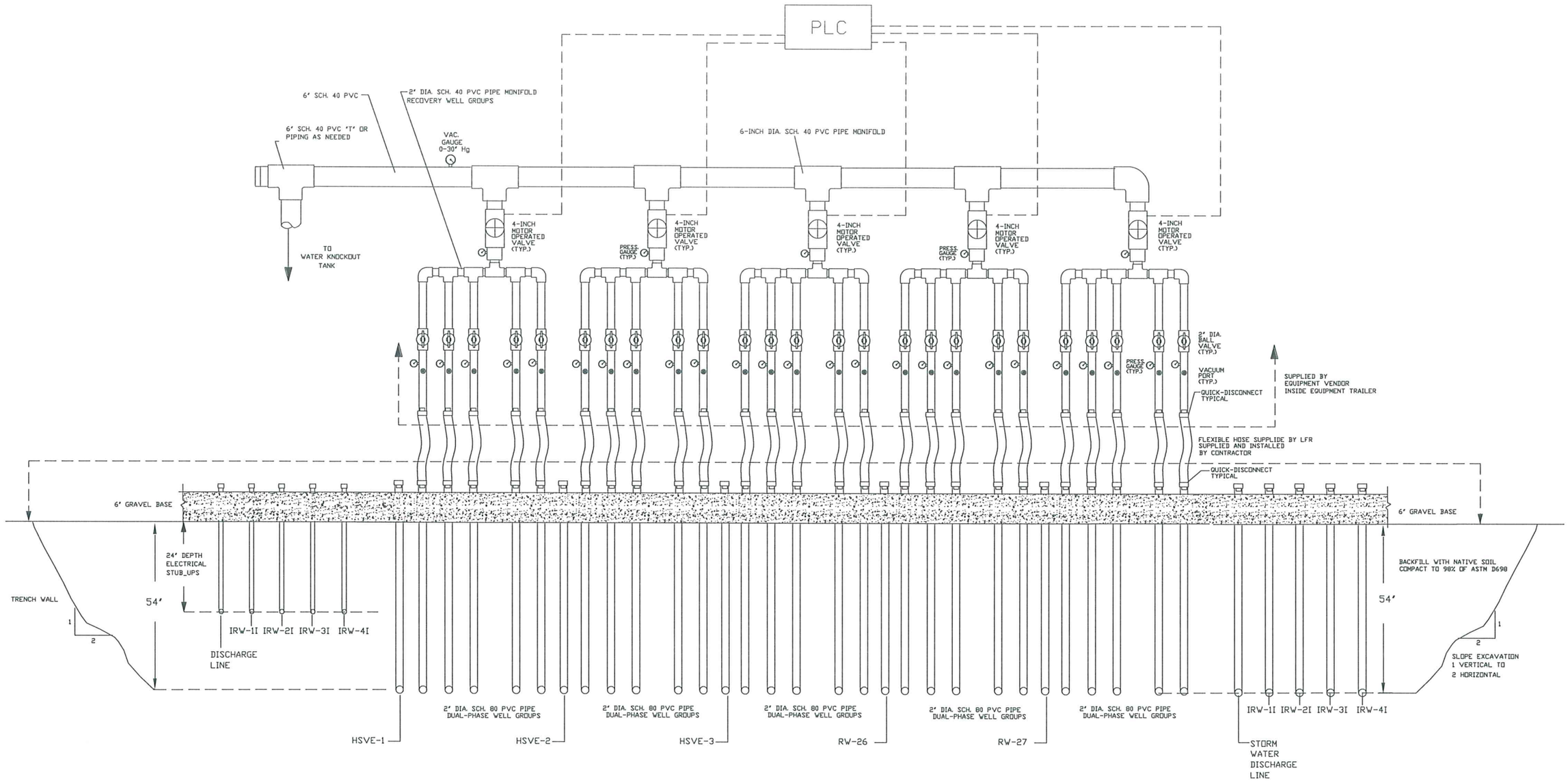
SCALE IN FEET

DATE 09/14/2010

PROJECT NO. 0040344511

SHEET 6

GRAPHICS 2009\3445 JONES UTICA\REMEDIAL DWGS 4-2011\PID-FIGURES-REPORT-SEPT-2010.DWG



SEAL

4/5/11

KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

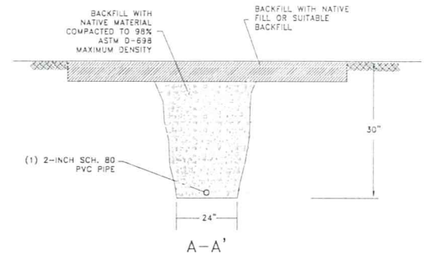
ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

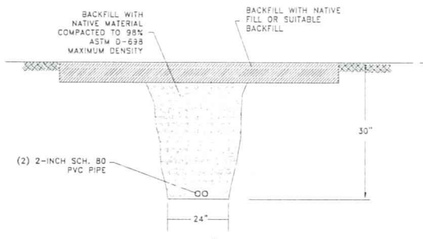
DUAL-PHASE EXTRACTION WELLS STUB-UP AND MANIFOLD DETAIL

SCALE NTS
DATE 09/14/2010
PROJECT NO. 0040344511
SHEET 7

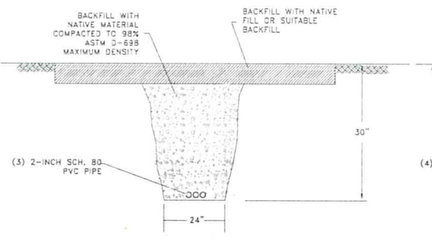
Jigraphics 2009\3445 Jones utica\remedial DWGS 4-2011\Jones-utica-building.dwg



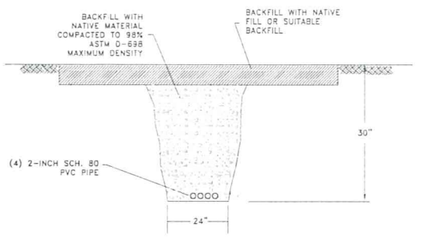
A–A'



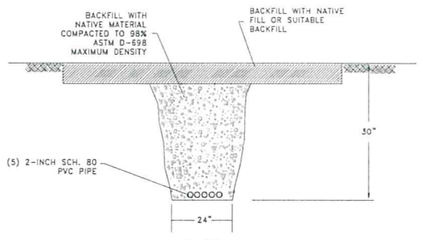
B–B'



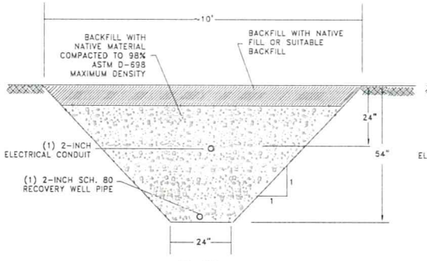
C–C'



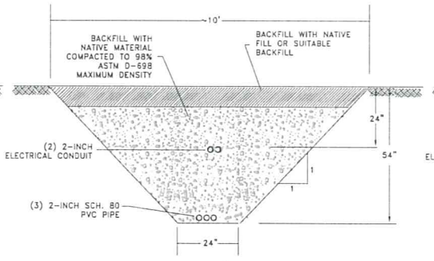
D–D'



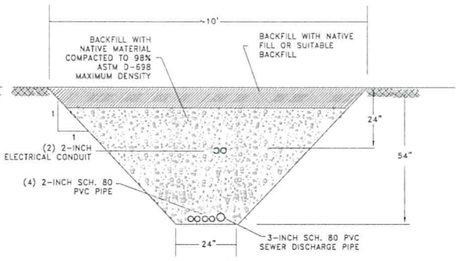
E–E'



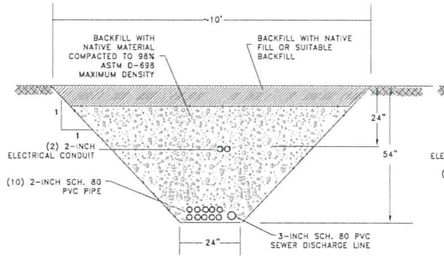
F–F'



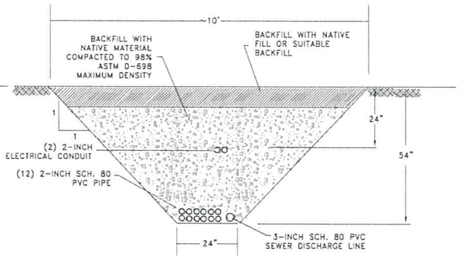
G–G'



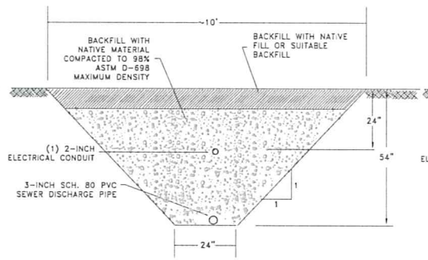
H–H'



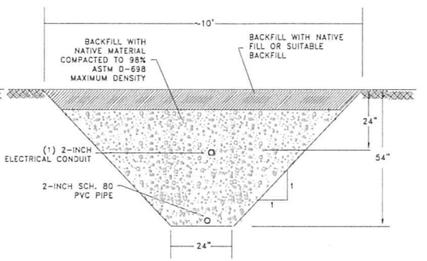
J–J'



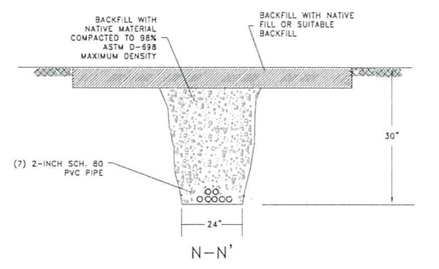
K–K'



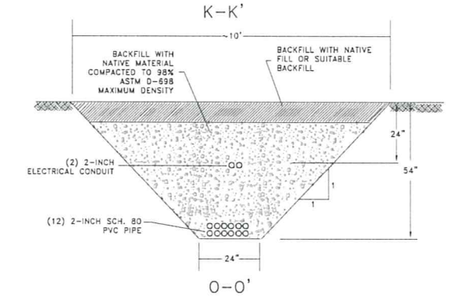
L–L'



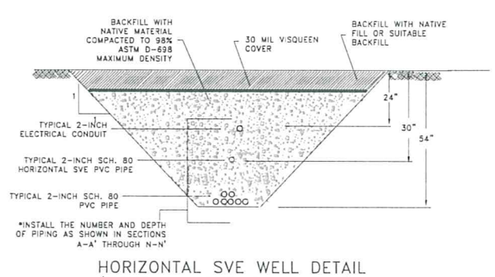
M–M'



N–N'



O–O'



HORIZONTAL SVE WELL DETAIL
(HSVE–1, HSVE–2, HSVE–3)

NOTES

- CONTRACTOR RESPONSIBLE FOR PROVIDING SECURITY / SAFETY CONTROLS AROUND THE EXCAVATION AREA AND STOCKPILE AREAS.
- CONTRACTOR IS RESPONSIBLE FOR ENSURING A PRIVATE UTILITY LOCATE IS CONDUCTED AROUND TRENCHING AREA PRIOR TO EXCAVATION ACTIVITIES.
- NATIVE OR SUITABLE SOIL WILL BE USED AS BACK FILL
- UNKNOWN NUMBER OF UTILITIES IN EXCAVATION AREA.
- TRENCHES WILL BE EXCAVATED TO A DEPTH OF APPROX. 54-INCHES
- SURFACE OF TRENCHES TO MATCH EXISTING GRADE AND SURFACE TYPE
- NATIVE OR SUITABLE MATERIAL, COMPACT TO 98% ASTM D698
- SECTIONS ARE NOT TO SCALE
- PROVIDE STEPS/LADDERS FOR EGRESS FROM TRENCH EVERY 25'
- SEE HORIZONTAL WELL SECTION FOR HSVE-1 THROUGH HSVE-3

SEAL

4/5/11

KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

PIPING TRENCH DETAILS

SCALE NTS
DATE 09/14/2010
PROJECT NO. 0040344511
SHEET 8

J:\graphics 2009\3445 Jones utica\remedial dwgs 4-2011\utica-trench_rem_05_09.dwg

SEE INSET MODIFICATION FOR CHEMICAL (REDUX) INJECTION INTO MPE MANIFOLD

BUILDING BLD-7901

MANIFOLD = VACUUM INLET (MFD-101)
MANIFOLD SIZE = 6"
MANIFOLD MATERIAL = PVC, TEES
NUMBER OF LEGS = 5
SIZE OF LEGS = 4"
(ONE LEG SHOWN AS TYPICAL)

4" FNPT INLET PORTS ON LEGS TYPICAL

30-0"HG PI 101 — BRASS — 4" PVC — PVC

30-0"HG PI 106 — MV 101

MANIFOLD = VACUUM INLET (MFD-102)
MANIFOLD SIZE = 6"
MANIFOLD MATERIAL = PVC, TEES
NUMBER OF LEGS = 5
SIZE OF LEGS = 4"
(ONE LEG SHOWN AS TYPICAL)

4" FNPT INLET PORTS ON LEGS TYPICAL

30-0"HG PI 107 — BRASS — 4" PVC — PVC

30-0"HG PI 112 — MV 102

MANIFOLD = VACUUM INLET (MFD-103)
MANIFOLD SIZE = 6"
MANIFOLD MATERIAL = PVC, TEES
NUMBER OF LEGS = 5
SIZE OF LEGS = 4"
(ONE LEG SHOWN AS TYPICAL)

4" FNPT INLET PORTS ON LEGS TYPICAL

30-0"HG PI 113 — BRASS — 4" PVC — PVC

30-0"HG PI 118 — MV 103

MANIFOLD = VACUUM INLET (MFD-104)
MANIFOLD SIZE = 6"
MANIFOLD MATERIAL = PVC, TEES
NUMBER OF LEGS = 5
SIZE OF LEGS = 4"
(ONE LEG SHOWN AS TYPICAL)

4" FNPT INLET PORTS ON LEGS TYPICAL

30-0"HG PI 119 — BRASS — 4" PVC — PVC

30-0"HG PI 124 — MV 104

4" INLET FILTER /SILENCER

3" DILUTION LINE PIPE TO OUTSIDE IN COLD WEATHER CLIMATES

MV 401

1/2" FNPT PIPED FROM XCH-1301

IN-LINE FILTER /SILENCER

6" PVC

30-0"HG PI 1001 — 0-250F TI 1001 — BRASS

0-3"WC PDI 1001 H L

30-0"HG PI 401

30-0"HG PI 402

DEMISTER

6" PVC

VAPOR/LIQUID SEPARATOR VLS-401

PVC — LG 401 — LSHH 401 — PT 401 — PVC

6" CLEAN-OUT

DRAIN PIPED TO OUTSIDE W/ 1" FNPT FITTING — BRASS — BRASS

BRASS

CHECK VALVE STEEL MOUNTED WITH FLOW HORIZONTAL

30-0"HG PI 1002 — 2"HG PSL 1001

SET @ 25"HG — BRASS

6" PVC

3/8" SEAL OIL SIPHON PICKUP LINE

OIL FILL

30-0"HG PI 1004

LRP

P 1001

2" GALV

NOTE: THIS VALVE TO BE TAGGED "FACTORY SET"

BRASS — BRASS — F 1001

2" GALV

0-250F TI 1003

BRASS — F 1002

USE HIGH TEMP SILICONE GASKET MATERIAL IN PLACE OF PIPE DOPE

PIPED FROM OIL OUTLET OF XCH-6401

1.5" GALV

FG 1001

4" WELDED ASSEMBLY

NOTES FOR OUTPUT:
FLOWRATE & PRESSURE = 1100ACFM @ 20"HG
HORSEPOWER = 100
VOLTAGE & PHASE = 460V, 3PH, TEFC CLI DIV2
FULL-LOAD AMPS = 112.5

4" FNPT PIPED TO XCH-1301

DEMISTER ELEMENT ALLOW FOR EASY REMOVAL OF ELEMENT

SEAL OIL SEPARATOR SOS-1001

0-15PSI PI 1003 — 50-500F TI 1002 — 4PSI PSH 1001 — 200F TSH 1001

LG 1001 — LSL 1001 — LSL 1001 — LSH 1001 — LSHH 1001

OIL FILL — BRASS — BRASS

1" GALV — DRAIN PIPED TO OUTSIDE W/ 1" FNPT FITTING

BRASS — BRASS — 2" GALV — PSI 10 — BRASS — 2" GALV — P 1002 — 2" GALV

NOTES FOR OUTPUT:
FLOWRATE & PRESSURE = 25GPM
HORSEPOWER = 0.75
VOLTAGE & PHASE = 460V, 3PH, TEFC, CLI DIV2
FULL-LOAD AMPS = 1.20

1.5" GALV — PIPED TO OIL INLET OF XCH-6401

RE-CIRCULATION — PSI 50 — BRASS — 3" PVC — PVC 1" — PVC 2" — PVC 2" — P 401 — PROGRESSIVE CAVITY TRANSFER PUMP

RE-CIRCULATION — PSI 50 — PVC 1" — PVC 2" — 0-60PSI PI 403 — FQI 401 — BRASS — PVC 2" — PIPE TO INLET OF AS-6401 — P 402 — PROGRESSIVE CAVITY TRANSFER PUMP

NOTES FOR PROGRESSIVE CAVITY PUMPS:
- CHECK VALVE ON DISCHARGE LOCATED DOWNSTREAM OF RE-CIRCULATION LINE
- OVERSIZE INLET PIPING TO REDUCE SUCTION LOSSES
- DOUBLE CLAMP FLEXIBLE CONNECTIONS

NOTES FOR OUTPUT:
FLOWRATE & PRESSURE = 35GPM @ 25'TDH (COMBINED)
HORSEPOWER = 1.5
VOLTAGE & PHASE = 460V, 3PH, TEFC, CLI DIV2
FULL-LOAD AMPS = 2

MANIFOLD = VACUUM INLET (MFD-105)
MANIFOLD SIZE = 6"
MANIFOLD MATERIAL = PVC, TEES
NUMBER OF LEGS = 5
SIZE OF LEGS = 4"
(ONE LEG SHOWN AS TYPICAL)

4" FNPT INLET PORTS ON LEGS TYPICAL

30-0"HG PI 125 — BRASS — 4" PVC — PVC

30-0"HG PI 130 — MV 105

LSHH 7901 — BUILDING SUMP SWITCH

BUILDING BLD-7902

DPE INFLUENT SAMPLE LOCATION

0-60"WC PI 1301 — 0-250F TI 1301 — 130F TSH 1301 — 2 PSIG PSH 1301 — 0-2"WC PDI 1301 H L

4" PVC

6" GALV 2' RISER

6" GALV TEE

PIPE CONDENSATE BACK TO INLET OF SEPARATOR, NOT INLET OF PUMP

1/2" VALVE

6" GALV

1/2" FNPT PIPED TO VLS-01 INLET

F 1301

NOTES FOR OUTPUT:
FLOWRATE & PRESSURE = 500SCFM @ IPSI
HORSEPOWER = 3
VOLTAGE & PHASE = 460V, 3PH, XPF
FULL-LOAD AMPS = 3.95

4" FNPT PIPED FROM SOS-1001

FERNCO

0-60"WC PI 1601

4" PVC — VAPOR PHASE CARBON VPC-1601 VIRGIN — BRASS

DPE EFFLUENT SAMPLE LOCATION

BRASS — FERNCO — 4" PVC — 0-60"WC PI 1602 — 4" PVC — VAPOR PHASE CARBON VPC-1602 VIRGIN — BRASS

PIPE SIPHON LINES BACK TO INLET OF SEPARATOR

4" FNPT PIPED TO STACK

STACK (SHIPPED LOOSE) TO TERMINATE WITH SCREENED TEE 15 FT ABOVE GRADE

4" PVC

SHIPPED LOOSE

INSET

MODIFICATION FOR CHEMICAL (REDUX) INJECTION INTO MPE MANIFOLD

ZONE (TYPICAL) 5 ZONES — CONNECTED TO SAMPLE PORT

CHECK VALVE

BLEED AIR ADJUSTABLE

MANIFOLD

5 INTAKE LINES 1 FOR EACH ZONE

ELECTRONIC CONTROLLED ON/OFF VALE

TIME ON/OFF TIMER

CHEMICAL INTAKE

BUILDING EQUIPMENT AND CONTROL PANEL

CONTROL PANEL

TO BE LOCATED ON BUILDING. PANEL TO BE A MINIMUM OF 36" FROM ANY HAZARDOUS PROCESS EQUIPMENT, AND A MINIMUM OF 36" ABOVE GRADE.

F 7901 — F 7902 — F 7903

H 7901 — H 7902 — H 7903

IS INPUT WIRING TO BE WIRED FOR INDOORS, ACCORDING NEC FOR HAZARDOUS LOCATIONS.

WIRING TO BE CLASS I DIVISION 2, AS PER THE NEC.

TO GROUNDWATER INLET MANIFOLD

WELL CAP

SUBMERSIBLE WELL PUMPS:
TOTAL WELL ASSEMBLIES = 4
WELL PUMPS ASSEMBLED = NO
WELL PROBES ASSEMBLED = NO
WATER DISCHARGE HOSE = 40' X 1"
POWER CABLES = (4) 40' TEFLON MOTOR LEAD
SUPPORT CABLES = (4) 40' X 1"

NOTES FOR OUTPUT:
FLOWRATE & PRESSURE = 2GPM @ 125'
HORSEPOWER = 0.5
VOLTAGE & PHASE = 230V, 1PH, GP
FULL-LOAD AMPS = 0.9

P 4001

USE A STAINLESS HOSE BARB

SHIPPED LOOSE

SEAL

4/5/11

KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

REMEDIAL SYSTEM P&ID

SCALE IN FEET
DATE 09/14/2010
PROJECT NO. 0040344511
SHEET 9

GRAPHICS 2009\3445 JONES UTICA\REMEDIAL DWGS 4-2011\PID-FIGURES-REPORT-SEPT-2010.DWG

BUILDING BLD-7902

AS-EFF
(AIR) SAMPLING
LOCATION

4" DIA.
10' HOSE

4" DIA.
10' HOSE

4" DIA.
10' HOSE

BRASS

BRASS

0-60"WC
PI
1603

0-60"WC
PI
1606

AS-INF
(AIR) SAMPLING
LOCATION

4"

VAPOR PHASE
CARBON
VPC-1603

4"

VAPOR PHASE
CARBON
VPC-1604

4"

4"

BRASS

BRASS

PIPE SIPHON LINES BACK TO INLET
OF SEPARATOR

4" FNPT
PIPED FROM
XCH-6401

4" FNPT
PIPED TO
STACK

STACK (SHIPPED LOOSE)
TO TERMINATE WITH
SCREENED TEE
15 FT ABOVE GRADE

4" PVC

SHIPPED LOOSE

BUILDING BLD-7901

MANIFOLD = WATER INLET (MFD-6401)
MANIFOLD SIZE = 2"
MANIFOLD MATERIAL = PVC
NUMBER OF LEGS = 4
SIZE OF LEGS = 1"
(ONE LEG SHOWN AS TYPICAL)

AS-INF
(H20) SAMPLING
LOCATION

1/4" NYLON HOSE

P
6101

CHEMICAL DRUM
BY OTHERS

1" FNPT
INLET PORTS
ON LEGS
TYPICAL

0-60PSI
PI
6401

BRASS

1" GALV

FI
6401

BRASS

BRASS

BRASS

BRASS

BRASS

BRASS

2" PVC

STATIC MIXER

2" DIA.

2" PVC

PIPED FROM P-401,
P-402 DISCHARGE

PIPED FROM LRP OIL
PUMP DISCHARGE

1.5" GALV

0-250F
TI
6403

0-15 PSI
PI
6405

0-4"WC
H
PDI
6402
L

4" PVC

120F
TSH
6401

0-250F
TI
6402

0-60"WC
PI
6404

0-250F
TI
6401

4" PVC

2" PVC

PIPED TO LRP OIL
COOLER INLET

1.5" GALV

TI
6404

0-250F

0-60"WC
PI
6403

4" PVC

0-60PSI
PI
6702

0-60PSI
PI
6701

BRASS

1.5" PVC

25 MICRON
FILTER
FLT-6701

BRASS

1.5" PVC

SEE MLEE STANDARD ASSEMBLY

2" DIA.
10' HOSE

57PSI
PSH
7001

0-60PSI
PI
7001

40PSI
PSH
6701

2"

2" HOSE

2" PVC

0-60PSI
PI
6704

0-60PSI
PI
6703

BRASS

BRASS

25 MICRON
FILTER
FLT-6702

1.5" PVC

BRASS

BRASS

1.5" PVC

LIQUID PHASE
CARBON
LPC-7001
VIRGIN

2"

BRASS

0-60PSI
PI
7002

BRASS

2"

BRASS

2" DIA.
10' HOSE

GAC -EFF
(SEWER DISCHARGE
SAMPLING LOCATION)

2" PVC

PROVIDE STACK ABOVE CHECK
VALVE ABOVE HIGHEST POINT IN
PROCESS LINE

TEE IN CHECK VALVE ABOVE
MAXIMUM LEVEL IN TANK OR
VESSEL

2" FNPT

NOTES FOR BAG FILTER:
- MOUNT UPSTREAM PRESSURE GAUGES, SWITCHES IN SIDE, NOT TOP
- LOCATE SHUTOFF VALVES BELOW BAG FILTER TO PREVENT FLOODING WHEN CHANGING ELEMENTS

FT
6401

FI
6401

2" PVC

BRASS

0-60PSI
PI
6402

BRASS

AS-EFF
(H20) SAMPLING
LOCATION

NOTES FOR OUTPUT:
FLOWRATE & PRESSURE = 35GPM @ 134' TDH
HORSEPOWER = 3
VOLTAGE & PHASE = 460V, 3PH, TEFC, CLI DIV2
FULL-LOAD AMPS = 3.95

P
6401

NOTES FOR CLEANING-CIRCULATION LINE:
- NO GALVANIZED PIPING IN CLEANING LINE AND INLET, OUTLET OF PUMP
- USE STAINLESS STEEL NIPPLE IN BASE OF PUMP FOR ACID PROTECTION AND STRUCTURAL STRENGTH

BRASS

PVC

CLEANING CIRCULATION LINE
1" PVC

4" PVC

PVC

PVC

30"WC
PSH
6402

5"WC
PSL
6401

AIR
STRIPPER
AS-6401

ACID FILL PORT
W/ PIPE CAP

INLET TRAP TO BE AT
LEAST 2' ABOVE LSHH

0-50"WC
PDI
6401
H
L

LG
6401

LSH
6401

LSHH
6401

4" PVC

STEEL

DRAIN PIPED TO
OUTSIDE W/ 1" FNPT
FITTING

1" PVC

PVC

PVC

2" PVC

PVC

NOTES FOR AIR STRIPPER:
MATERIAL OF CONSTRUCTION = STAINLESS STEEL
NUMBER OF TRAYS = 4
IMMERSION HEATER = NO
USE PVC STRAIN-RELIEFS WHERE BALL FLOATS ENTER STRIPPER

NOTES FOR OUTPUT:
FLOWRATE & PRESSURE = 320SCFM @ 30"WC
HORSEPOWER = 5
VOLTAGE & PHASE = 460V, 3PH, TEFC, CLI DIV2
FULL-LOAD AMPS = 6.25

0-60"WC
PI
6401

B
6401

NOTES FOR AIR STRIPPER BLOWER:
- COVER INLET W/ WIRE MESH AND SHOULD HAVE ELBOW DOWN
- DRILL AND TAP A 1/4" HOLE IN BOTTOM OF NYB AND PLUG W/ 1/4" PLUG
- PIPE INLET TO OUTSIDE IN COLD-WEATHER CLIMATES

2" NPT

LSHH
9901

REINJECTION GALLERY
(LEVEL-SWITCH ASSEMBLY
SHIPPED LOOSE)

SEAL

4/15/11

KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

REMEDIAL SYSTEM P&ID

SCALE IN FEET

DATE 09/14/2010

PROJECT NO. 0040344511

SHEET 10

GRAPHICS 2009\3445 JONES UTICA\REMEDIAL DWGS 4-2011\PID-FIGURES-REPORT-SEPT-2010.DWG

FLOW DIAGRAM SYMBOLS

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

- LOCALLY MOUNTED INSTRUMENT (IN FIELD)
- FRONT PANEL MOUNTED INSTRUMENT (IN CONTROL ROOM)
- BACK PANEL MOUNTED INSTRUMENT (IN CONTROL ROOM)
- FRONT PANEL MOUNTED INSTRUMENT (AUXILIARY LOCATION)
- BACK PANEL MOUNTED INSTRUMENT (AUXILIARY LOCATION)
- SHARED DISPLAY, SHARED CONTROL: DCS OR PLC INPUT/OUTPUT
- COMPUTER FUNCTION DCS OR PLC INPUT/OUTPUT
- PROGRAMMABLE LOGIC CONTROL FUNCTION DCS OR PLC INPUT/OUTPUT
- FRONT PANEL MOUNTED INDICATING LIGHT (IN CONTROL ROOM)

FLOW ELEMENTS

- ORIFICE PLATE W/FLG TAPS
- VORTEX
- POSITIVE DISPLACEMENT
- TURBINE
- PADDLEWHEEL
- AVERAGING PITOT TUBE
- STRAIGHTENING VANE

PIPING AND OTHER IN-LINE INSTRUMENTS

- RUPTURE DISC (PRESSURE)
- RUPTURE DISC (VACUUM)
- 1"x2" REDUCER
- FILTER
- STRAINER ("Y" TYPE)
- STRAINER (CONE OR FLAT TYPE)
- HOSE CONNECTION
- FLEXIBLE HOSE
- OPEN DRAIN
- SPECTACLE BLIND
- WELD CAP
- THREADED CAP
- THREADED PLUG

LINE SYMBOLS

- INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)
- INSTRUMENT ELECTRICAL SIGNAL
- INSTRUMENT SIGNAL AIR LINE
- INSTRUMENT CAPILLARY LINE
- HYDRAULIC LINE
- ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED)
- ELECTROMAGNETIC OR SONIC SIGNAL (UNGUIDED)
- ELECTRICAL HEAT TRACE
- STEAM HEAT TRACE
- INSULATION
- BATTERY LIMIT (BL)
- DWG. NO. CONTINUATION ARROW
- UTIL. DWG. CONTINUATION OUTSIDE OF WORK PRODUCT
- HF2 / HF3 MATERIAL, INSULATION OR PIPING SPEC. CHANGE

VALVES AND ACTUATORS

- SLIDE GATE VALVE
- MANUAL GATE OR CONTROLLING GLOBE VALVE
- MANUAL GLOBE VALVE
- NEEDLE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- DIAPHRAGM VALVE
- 3-WAY VALVE
- 4-WAY VALVE
- PLUG VALVE
- ANGLE VALVE
- CHECK VALVE
- PRESSURE RELIEF VALVE
- VACUUM RELIEF VALVE
- PRESSURE & VACUUM RELIEF VALVE
- FC CONTROL VALVE WITH DIAPHRAGM ACTUATOR (FAIL CLOSE)
- FO CONTROL VALVE WITH DIAPHRAGM ACTUATOR (FAIL OPEN)
- PRESSURE REDUCING REGULATOR SELF-CONTAINED
- PRESSURE REDUCING REGULATOR WITH EXTERNAL PRESSURE TAP
- BACK PRESSURE REGULATOR SELF-CONTAINED
- M MOTOR ACTUATED VALVE
- PNEUMATICALLY ACTUATED VALVE
- S SOLENOID ACTUATED 3-WAY VALVE
- HANDWHEEL
- VANE ACTUATOR

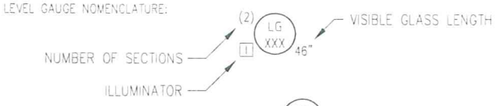
MISCELLANEOUS

- P PURGE
- LOGIC INTERLOCK
- CHEMICAL SEAL
- SP SPECIALTY ITEM
- TIE IN TIE IN TO EXISTING PIPING OR PIPING BY OTHERS
- CC CORROSION COUPON

EXPLANATION OF IDENTIFICATION LETTERS

(1) ANY FIRST LETTER, IF USED IN COMBINATION WITH MODIFYING LETTERS D(DIFFERENTIAL), F(RATIO), M(MOMENTARY), K(TIME RATE OF CHANGE), Q(INTEGRATE OR TOTALIZE), OR ANY COMBINATION OF THESE IS INTENDED TO REPRESENT A NEW AND SEPARATE MEASURED VARIABLE, AND THE COMBINATION IS TREATED AS A FIRST LETTER ENTITY. THUS, INSTRUMENTS TDI AND TI INDICATE TWO DIFFERENT VARIABLES, NAMELY, DIFFERENTIAL TEMPERATURE AND TEMPERATURE. MODIFYING LETTERS ARE USED WHEN APPLICABLE.

(2) LEVEL GAUGE NOMENCLATURE:



(3) IDENTIFY RELAYS WITH FUNCTIONAL SUPERSCRIPT. FY XXX

(4) IDENTIFY ANALYZERS AND EQUIPMENT WITH SUPERSCRIPT OUTSIDE OF CIRCLE AE XXX 2
I.E. CO_2, PH, H_2S, ETC.

(5) FOR VACUUM OR DRAFT INSTRUMENTS ADD SUPERSCRIPT OUTSIDE OF CIRCLE PI XXX PI XXX

(6) EXCEPTIONS TO SCHEDULE OF IDENTIFICATION LETTERS:

FA – FLAME ARRESTOR	I/P – CURRENT TO PNEUMATIC CONVERTER
LD – LIQUID DRAINER	HSD – HAND SHUTDOWN
ST – STEAM TRAP	SS – SELECTOR SWITCH
SP – SET POINT	FC – FAIL CLOSED
BL – BATTERY LIMIT	FO – FAIL OPEN
TC – THERMOCOUPLE	NC – NORMALLY CLOSED
RTD – RESISTANCE TEMPERATURE DETECTOR	NO – NORMALLY OPEN
ESD – EMERGENCY SHUTDOWN	SC – SAMPLE CONNECTION
USD – UNIT SHUTDOWN	SO – STEAM OUT CONNECTION
SD – SHUTDOWN	TSO – TIGHT SHUT OFF
PB – PUSHBUTTON	TS – TEMPORARY STRAINER
HOA – HAND-OFF-AUTO SELECTOR SWITCH	VFD – VARIABLE FREQUENCY DRIVE
LOR – LOCAL-OFF-REMOTE SELECTOR SWITCH	
JOA – JOG-OFF-AUTO SELECTOR SWITCH	

(7) SUPPLY DESIGNATIONS:

AS – AIR SUPPLY	NS – NITROGEN SUPPLY
ES – ELECTRIC SUPPLY	SS – STEAM SUPPLY
GS – GAS SUPPLY	WS – WATER SUPPLY
HS – HYDRAULIC SUPPLY	PG – PROCESS GAS
IA – INSTRUMENT AIR	PW – PROCESS WATER

(8) ELECTRICAL RELAYS, SWITCHES AND MISC. ITEMS IDENTIFIED WITH AN INSTRUMENT TAG BALLOON AND AN (E) SHOWN IN PLACE OF THE INSTRUMENT TAG NUMBER ARE TO BE SPECIFIED AND FURNISHED BY ELECTRICAL.

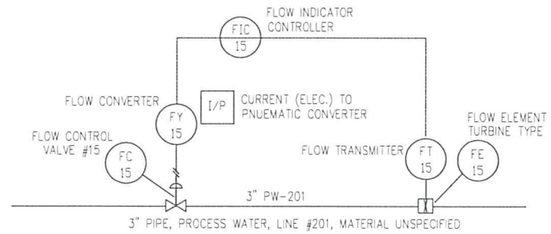
HOA (E) HOA XXX

(9) INSULATION DESIGNATIONS:

H – HIGH TEMP. MAINTENANCE	NP – NOISE PROTECTION
C – LOW TEMP. MAINTENANCE	
PP – PERSONAL PROTECTION	
FP – FREEZE PROTECTION	

	FIRST LETTER (1)		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, FLAME		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY			CONTROL	
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	GAUGING (DIMENSIONAL)		GLASS VIEWING DEVICE		
H	HAND (MANUAL)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE OR HUMIDITY	MOMENTARY			MIDDLE INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE RESTRICTION		
P	PRESSURE VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECH. ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TYPICAL LOOP IDENTIFICATION



LINE NUMBER DESIGNATION EXAMPLE

3"-PG-101-CS

- 3" — LINE SIZE
- PG — FLUID SYMBOL
- 101 — LINE NUMBER
- CS — MATERIAL CLASS

SEAL

4/5/11

KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

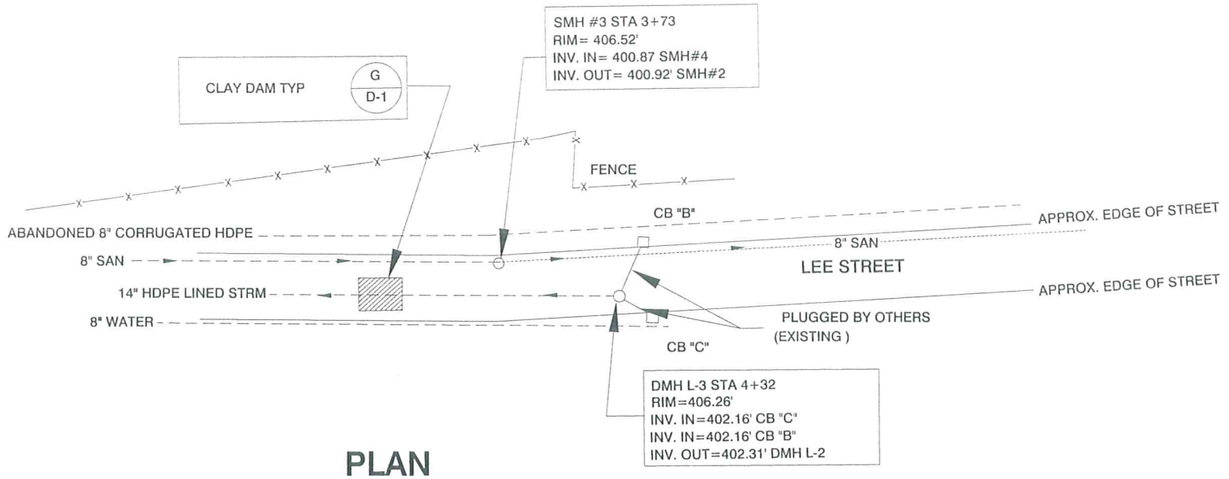
ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

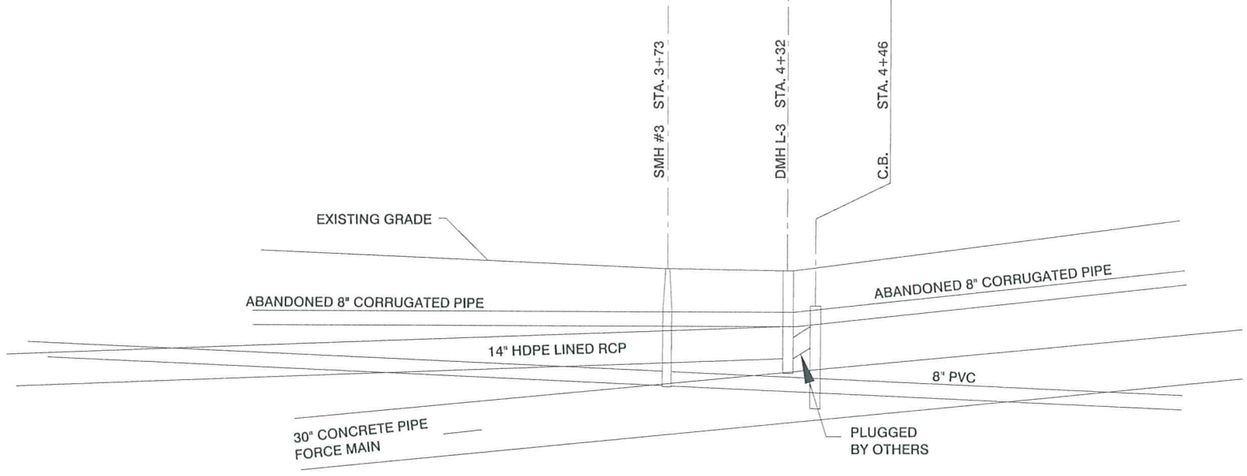
PROCESS AND INSTRUMENTATION LEGEND

SCALE NTS
DATE 9/14/2010
PROJECT NO. 0040344511
SHEET 11

J:\graphics 2009\3445 jones utica\remedial dwgs 4-2011\PID-LEGEND.dwg



PLAN



PROFILE

NOTES

- FIGURE ORIGINATED FROM: CDM, NIAGARA MOHAWK, A NATIONAL GRID COMPANY, HARBOR POINT SITE, UTICA, NEW YORK, STORM AND SANITARY SEWER SYSTEMS, REHABILITATION/ REPLACEMENT, LEE STREET UTILITY PLAN AND PROFILE, SHEET# C-004R, JULY 2005
- REFERENCED SITE LOCATED ON SOUTH SIDE OF LEE STREET
- REMEDIATION SYSTEM DISCHARGE POINT WILL BE TAPPED INTO MAN HOLE DMH L-3 STA 4+32
- REMEDIATION SYSTEM DISCHARGE LINE WILL BE INSTALLED +/- 2 FEET BGS.
- A 7-INCH LAYER OF 4000 PSI, 6"x6" WELDED WIRE MESH REINFORCED CONCRETE WILL BE INSTALLED, LAYERED WITH A 20-MIL PLASTIC LINER, WITH A 2-INCH LAYER OF 4000 PSI CONCRETE INSTALLED ON TOP OF THE 20-MIL LINER. THE 2-INCH CONCRETE WILL BE REMOVER IN MAY 2010 WITH ASPHALT TO MATCH ROAD.
- A +/- 4-INCH HOLE WILL BE CUT INTO THE WALL OF THE STORM SEWER FOR INSTALLATION OF THE 3-INCH SEWER DISCHARGE LINE.
- A RUBBER "O" RING WILL BE PLACED AROUND 3-INCH DISCHARGE LINE TO CREATE A SEAL. "O" RING AS APPROVED BY THE CITY OF UTICA.
- A 3-INCH ELBOW WILL BE INSTALLED ONTO THE SEWER DISCHARGE LINE AT THE DISCHARGE LOCATION.
- CONTRACTOR TO REPAIR OR REPLACE ANY CONCRETE OR ASPHALT DAMAGED OR REMOVED.
- CONCRETE AND ASPHALT TO MATCH THE THICKNESS, ELEVATION, AND TEXTURE OF CONCRETE OR ASPHALT DAMAGED OR REMOVED.
- ALL CONCRETE IS TO BE 4000 PSI FIBER REINFORCED TYPE I. IN ACCORDANCE WITH ASTM STANDARD SPECIFICATION FOR PORTLAND CEMENT DESIGNATION C150
- USE 6x6 #10 WELDED WIRE MESH IN CONCRETE
- CONTRACTOR IS RESPONSIBLE FOR OBTAINING PERMITS NEEDED FOR SEWER PENETRATION POINTS AND CONSTRUCTION.
- CONTRACTOR TO OBTAIN ROAD CLOSURE PERMIT AND CONSTRUCTION PERMIT.
- CONTRACTOR RESPONSIBLE FOR PROVIDING SECURITY / SAFETY CONTROLS AROUND THE EXCAVATION AREA AND STOCKPILE AREAS.
- CONTRACTOR IS RESPONSIBLE FOR CONDUCTING A PRIVATE UTILITY LOCATE PRIOR TO EXCAVATION ACTIVITIES.
- UNKNOWN NUMBER OF UTILITIES IN EXCAVATION AREA.
- SURFACE OF TRENCHES TO MATCH EXISTING GRADE AND SURFACE TYPE.

SEAL

4/5/11

KEVIN WARNER P.E.
NEW YORK P.E. 083283-1

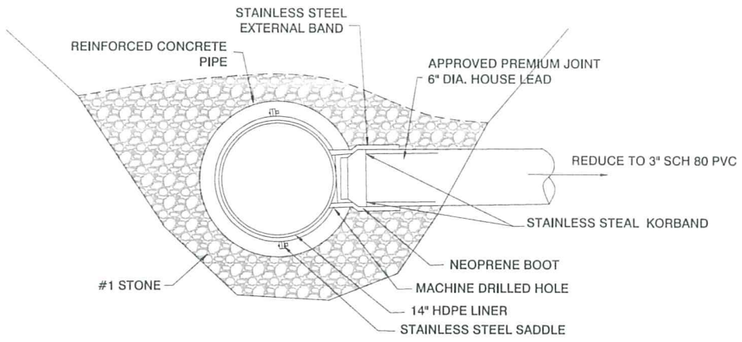
ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

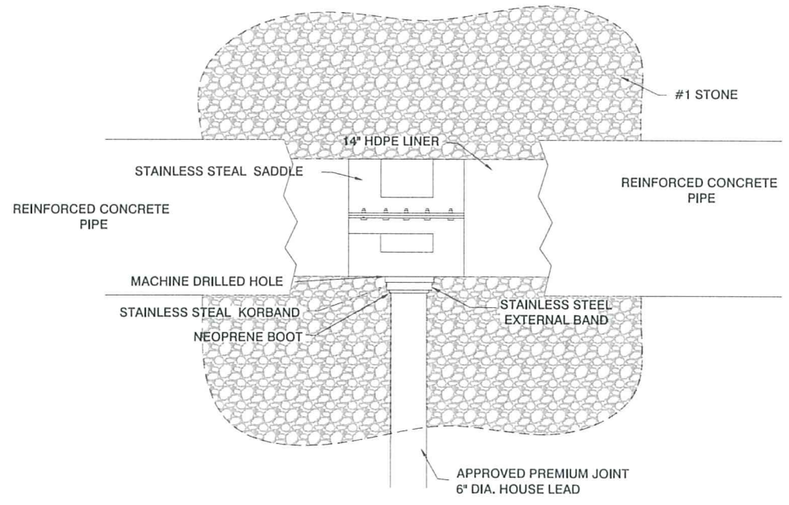
SEWER DISCHARGE LOCATION DETAIL

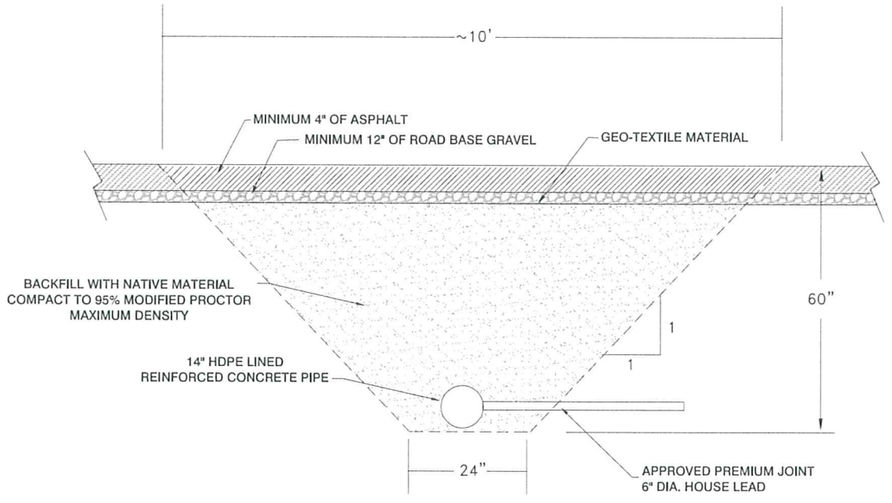
SCALE	NTS
DATE	09/14/2010
PROJECT NO.	SHEET
0040344511	12

J:graphics 2009\3445 jones utica\remedial dwgs 4-2011\3445-Manhole discharge.dwg



SADDLE TAP FOR HDPE LINED CONCRETE PIPE





NOTES

- FIGURE ORIGINATED FROM: CDM, NIAGARA MOHAWK, A NATIONAL GRID COMPANY, HARBOR POINT SITE, UTICA, NEW YORK, STORM AND SANITARY SEWER SYSTEMS, REHABILITATION/ REPLACEMENT, LEE STREET UTILITY PLAN AND PROFILE, SHEET# C-004R, JULY 2005
- REFERENCED SITE LOCATED ON SOUTH SIDE OF LEE STREET
- TAP LOCATION IS APPROXIMATELY 10 FT FROM DMH L-3
- CONTRACTOR IS RESPONSIBLE FOR INSTALLING A LFR APPROVED "SADDLE" TAP FOR INSTALLATION OF (1) 3 INCH SCH 80 CONDUIT INTO THE EXISTING 14 INCH HDPE LINED STRM PIPE AT THE APPROXIMATE LOCATION SHOWN IN FIGURE 9 (SEWER DISCHARGE DETAIL.)
- REFERENCE FIGURE 11 (SEWER TAP DETAIL) FOR TAPPING INFO.
- EXCAVATION AREA AROUND 14"HDPE TAP LOCATION WILL BE BACKFILLED WITH #1 STONE
- CONTRACTOR TO REPAIR OR REPLACE ANY CONCRETE OR ASPHALT DAMAGED OR REMOVED.
- CONCRETE AND ASPHALT TO MATCH THE THICKNESS, ELEVATION, AND TEXTURE OF CONCRETE OR ASPHALT DAMAGED OR REMOVED.
- ALL CONCRETE IS TO BE 4000 PSI FIBER REINFORCED TYPE I, IN ACCORDANCE WITH ASTM STANDARD SPECIFICATION FOR PORTLAND CEMENT DESIGNATION C150
- CONSTRUCTION JOINTS TO BE 10 FT O.C. AT EXISTING CONCRETE.
- USE 6x6 #10 WELDING MESH IN CONCRETE
- CONTRACTOR IS RESPONSIBLE FOR OBTAINING PERMITS NEEDED FOR SEWER PENETRATION POINTS AND CONSTRUCTION.
- CONTRACTOR RESPONSIBLE FOR PROVIDING SECURITY / SAFETY CONTROLS AROUND THE EXCAVATION AREA AND STOCKPILE AREAS.
- CONTRACTOR IS RESPONSIBLE FOR CONDUCTING A PRIVATE UTILITY LOCATE PRIOR TO EXCAVATION ACTIVITIES.
- UNKNOWN NUMBER OF UTILITIES IN EXCAVATION AREA.
- TRENCHES WILL BE EXCAVATED TO A DEPTH OF APPROX. 54-INCHES.
- SURFACE OF TRENCHES TO MATCH EXISTING GRADE AND SURFACE TYPE.
- NATIVE OR SUITABLE BACK FILL COMPACT TO 98% ASTM D698.

SEAL
4/5/11
KEVIN WARNER P.E.
NEW YORK P.E. 083283

ARCADIS

FORMER MONARCH CHEMICALS, INC. SITE
37 MEADOW STREET
UTICA, NEW YORK

ROADWAY CUT AND REPAIR DETAIL

SCALE NTS
DATE 09/14/2010
PROJECT NO. 0040344511
SHEET 13

J:\graphics 2009\3445 jones utica\remedial dwgs 4-2011\3445-Manhole discharge.dwg