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ENVIRONMENT

Mr. George Jacob
Remedial Project Manager
Central New York Remediation Section
United States Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866

Subject:
Work Plan to Install Additional Monitoring Wells, JCI Jones Chemicals, Inc.,
100 Sunny Sol Boulevard, Caledonia, New York

Date:
May 6, 2011

Contact:
Shekhar R. Melkote, P.G.

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570.961.9433

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Our ref:
TL003165.0027

Dear Mr. Jacob:

On behalf of JCI Jones Chemicals, Inc. (JCI), ARCADIS U.S., Inc. (ARCADIS; formerly LFR Inc.) is submitting this work plan to install additional monitoring wells at the JCI Superfund site located in Caledonia, New York ("the Site"). This work plan provides the scope of work, proposed monitoring well locations, and schedule.

Background

In November 2010, the United States Environmental Protection Agency (U.S. EPA) conducted the first five-year review since the installation and operation of the remedial system at the Site. Subsequent to the five-year review, U.S. EPA requested that additional monitoring wells be installed to the north, south, and west of the source area to evaluate groundwater quality and flow.

The Remedial Investigation (LFR 1999) indicated that chlorinated solvents (including tetrachloroethene and its breakdown products) are the primary chemicals of interest at the Site. The highest concentrations in soil and groundwater were found in the western portion of the Site; the source was found to be associated with the former tank pad area (Figure 1).

The Site is located in the Village of Caledonia in western New York. Land use in the vicinity of the Site is mixed-residential, commercial, agricultural, and industrial. The regional physiography shows profound effects of recent periods of glaciation. Depths to groundwater range between 14 and 18 feet below ground surface (bgs); groundwater occurs under unconfined conditions. Soil lithology consists of an overburden zone comprised of a gravel-sand-silt mixture underlain by the carbonate

(dolomite) bedrock. The overburden lithology ranges in color from dark gray to grayish brown and is typically well graded (poorly sorted); the gravel size ranges from few millimeters to more than 3 inches, and the contact between the overburden and bedrock is weathered.

Active remediation to treat chlorinated solvent-affected soil and groundwater has been ongoing since 1996. The groundwater pump-and-treat system was started in 1996 with additional extraction wells piped in March 2004. A soil-vapor extraction (SVE) system was in operation from April 2004 to May 2008 to treat affected soil in the source area. Since 2005, in situ chemical oxidation (ISCO) treatment using sodium permanganate has been conducted annually in the source area; initially ISCO treatment was conducted semiannually. The groundwater-treatment system and the associated air-stripping tower are in operation 24 hours per day, treating approximately 300 gallons per minute. Since the implementation of the remedy (SVE, groundwater pump-and-treat, and ISCO) in 1996, soil and groundwater concentrations have declined significantly.

More information regarding the Site background and history is provided in the Remedial Investigation Report (LFR 1999), Feasibility Study Report (LFR 2000), and Remedial Action Work Plan (LFR 2003). The various semiannual operation, maintenance, and monitoring reports prepared since 2005 summarize the remediation work and results.

Installation of Additional Monitoring Wells

ARCADIS proposes to install one overburden monitoring well (OP-17) and four bedrock monitoring wells (BP-7 through BP-10) in locations shown on Figure 1. Nothnagle Drilling Inc., a licensed well driller located in Scottsville, New York, will be subcontracted to install the monitoring wells. Monitoring wells OP-17, BP-7, and BP-8 will be installed in the open field to the north of the source area; BP-9 and BP-10 will be installed on the JCI property, to west and south of the source area. To obtain groundwater quality, flow, and gradient data, OP-17 and BP-7 will be installed as one cluster, and BP-8, BP-9, and BP-10 will be installed adjacent to existing overburden monitoring wells OP-9, OP-12, and OP-15, respectively. The proposed well locations shown on Figure 1 may be adjusted based on field conditions and site access.

Based on the groundwater quality and flow data obtained through the existing and new monitoring wells, additional testing of the bedrock zone may be conducted within in the source area.

Overburden Monitoring Well

The overburden well (OP-17) will be installed to approximately 22 feet bgs using the hollow-stem auger method. The well will be constructed of 2-inch-diameter, Schedule 40 PVC with 5 feet of 0.010-inch screen; approximately 17 feet of Schedule 40 PVC riser pipe will be flush-jointed to the 5-foot PVC screen. The annular space between the borehole and the screen will be filled with sand filter pack to 2 feet above the top of the screen (15 to 22 feet bgs). A 2-foot bentonite seal will be placed above the sand filter pack, and the remaining annular space to the surface will be filled with Type I Portland cement. The monitoring well will completed with a flush-to-grade concrete pad and steel manhole.

Bedrock Monitoring Wells

The four bedrock monitoring wells (BP-7 through BP-10) will be installed using a combination of hollow-stem auger and rotary-drilling methods. Based on previous data, the depth to bedrock is expected to range between 32 and 40 feet in the western portion of the Site. The four bedrock monitoring wells will be constructed of 2-inch-diameter, Schedule 40 PVC pipe flush-jointed with 10 feet of 0.010-inch Schedule 40 PVC screen that will be placed entirely in the bedrock zone. The annular space between the borehole and the screen will be filled with sand filter pack to 2 feet above the top of the screen. A 2-foot bentonite seal will be placed above the sand filter pack, and the remaining annular space to the surface will be filled with Type I Portland cement. Bedrock monitoring wells BP-7 and BP-8, located in the open field to north, will completed with flush-to-grade concrete pads and steel manholes; BP-9 and BP-10 at the JCI facility will be completed in aboveground steel boxes.

Permanent and temporary double-casing (or surface casing) technique will be employed to minimize cross-circulation of fluids between the overburden and bedrock zones. Due to presence of low levels of chlorinated solvents detected in overburden monitoring well OP-9 (Figure 1), bedrock wells BP-7 and BP-8 will be double-cased with permanent surface casing. The hollow-stem augers (nominal 10-inch outside diameter and 6 ¼-inch inside diameter) will be advanced to top of the first occurrence of the competent bedrock and temporarily left in place. A 4-inch-

diameter steel surface casing will be set approximately 18 inches into the competent bedrock and anchored into position with cement that is pressure (tremie) grouted from bottom to top into the annulus between the steel casing and borehole. After allowing the cement to cure for at least 24 hours, a rotary drill bit will be advanced through the 4-inch surface casing to set the 2-inch-diameter PVC well into bedrock as described above.

As the chemicals of interest were below the criteria in OP-12 and OP-15, temporary surface casing will be used to install BP-9 and BP-10. The hollow-stem augers will be advanced to top of the first occurrence of the competent bedrock and temporarily left in place. A 4-inch diameter steel temporary surface casing will be installed (driven) to the top of the competent bedrock. Rotary drilling will be used to advance through inside of the 4-inch steel casing to set the 2-inch-diameter PVC well into bedrock as described above. Both the hollow-stem augers and steel casings will be retrieved as the wells are being grouted.

Decontamination and Well Development

All drilling equipment—such as hollow-stem augers, drill bits, and drill stems—will be steam-cleaned between well locations.

After grout maturation, the newly installed monitoring wells will be developed using a combination of surging and pumping until an appreciable reduction in fines is observed and much of the turbidity removed. The development water will be containerized and treated using the air-stripping unit. As previously approved by the U.S. EPA, drill cuttings will be managed on site unless free product or gross visible contamination is observed, in which case the cuttings will containerized in drums for off-site disposal.

Well Survey

The top-of-casing elevations and the horizontal coordinates will be surveyed by a licensed surveyor registered in the State of New York. The top-of-casing elevations will be referenced to the North American Vertical Datum of 1988 and horizontal coordinates to the North American Datum projected on the New York State Plane Coordinates System.

Reporting

During well installation, soil and rock from the borings will be observed and logged by field personnel using the Unified Soil Classification System. Soil from multiple intervals will be screened for head space using a portable photoionization detector.

The newly installed monitoring wells will be sampled for volatile organic compound analysis using EPA Method 8021C in conjunction with the semiannual monitoring event. All samples will be analyzed by Columbia Analytical Services, Inc., Rochester, New York—a full-service environmental laboratory with National Environmental Laboratory Accreditation Conference certification. A round of water levels from the newly installed (and existing) monitoring wells will be measured to evaluate groundwater flow and gradients. The results of the sampling and groundwater flow conditions will be presented in the next semiannual monitoring report.

Schedule

To facilitate installation of the additional monitoring wells, ARCADIS proposes to install the additional monitoring wells prior to the next semiannual monitoring event. The new monitoring wells will be sampled along with the other wells sampled semiannually. This will allow us to present a comprehensive and synoptic evaluation of site data and conditions. A report describing the installation and sampling of the additional wells, along with the results of the routine semiannual monitoring, will submitted upon receipt, review, and evaluation of monitoring data.

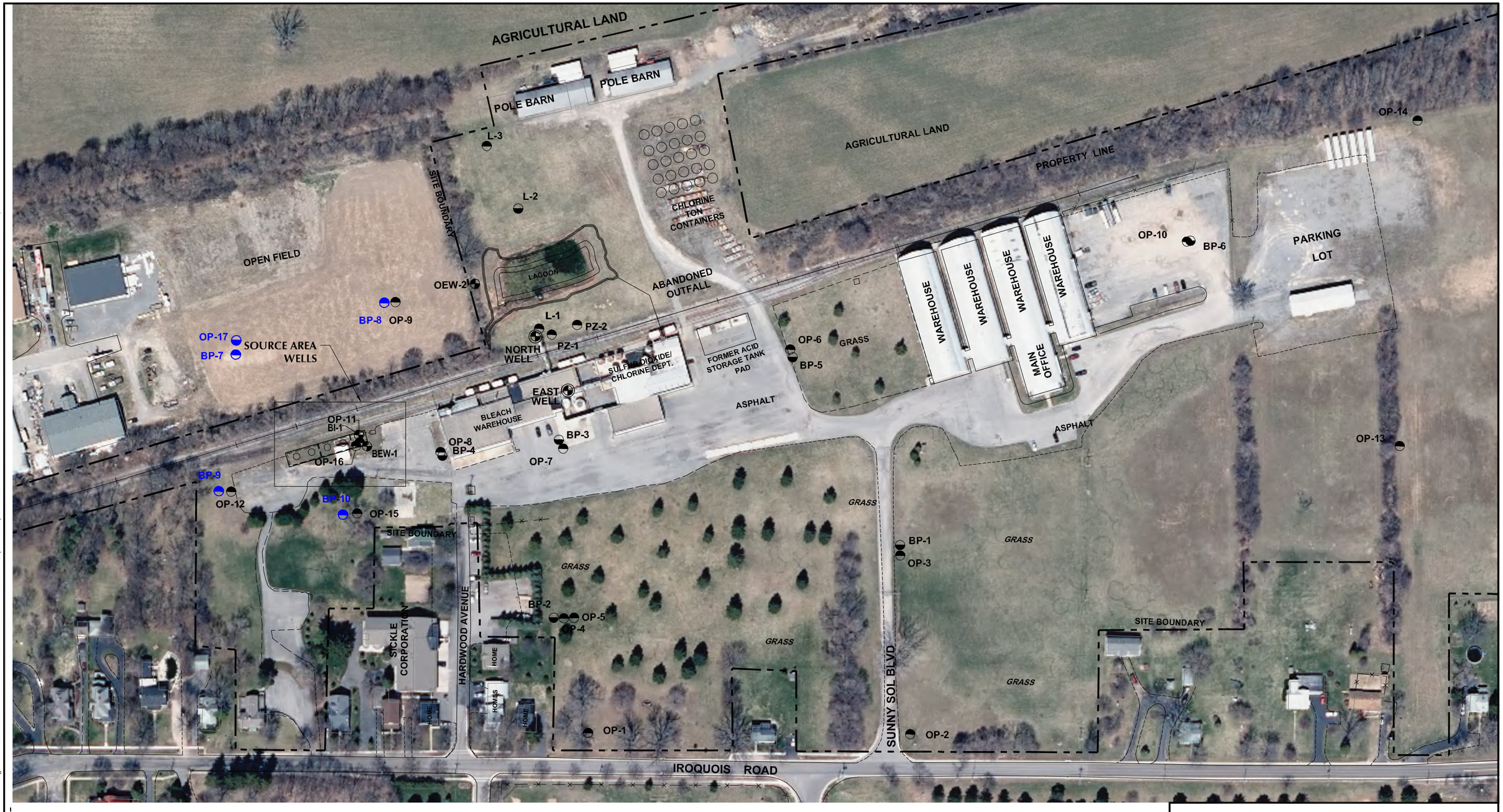
Please contact me at 570.961.9433 if you have any questions or comments.

Sincerely,

ARCADIS U.S., Inc.

Shekhar Melkote
Principal Hydrogeologist

Copies:
Tom Festa; NYSDEC
Tim Gaffney; JCI
Kevin M. Warner, P.E.; ARCADIS



LEGEND

- Site boundary JCI Jones Chemicals, Inc.
- Monitoring well-Bedrock
- Monitoring well-Overburden
- Production well
- OEW-1 Overburden Extraction well
- BEW-1 Bedrock Extraction well
- OW-1 Vapor Observation well
- Bedrock Injection well
- SVE well
- Overburden Groundwater Injection Well
- Proposed Monitoring Well-Bedrock
- Proposed Monitoring well-Overburden

0 150 FEET
SCALE IN FEET

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JCI JONES CHEMICALS, INC. - SUPERFUND SITE
CALEDONIA, NEW YORK

SITE MAP WITH MONITORING WELLS

ARCADIS

FIGURE 1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\Graphics\Graphics 2009\0165 caledonia\316revisedbase.dwg LAYOUT: LAYOUT1 SAVED: 5/6/2011 1:13 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: ---
XREFS: PROJECTNAME: --- PLOTSTYLETABLE: FDEP.CTB PLOTTED: 5/6/2011 3:38 PM BY: BERNDGEN, WENDY