Periodic Review Report

For

CMS ASSOCIATES REMEDIATION SITE
Site no. 915168

210 French Road
Town of Cheektowaga
Erie County NY

June 2019

Prepared for:

CMS Property Associates, LLC
100 Corporate Parkway
Suite 200
Amherst, NY 14226

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FIGURES

APPENDICES

I INTRODUCTION

1.1 Summary of Site

The CMS Property Associates Remediation Site is at 210 French Road in the Town of Cheektowaga, Erie County, NY, and is designated site no. 915168 on the *NYS Registry of Inactive Hazardous Waste Sites*. See Figure 1 for the site location.

A spill investigation and cleanup began after CMS excavated and removed in March 1996 what turned out to be a leaking, underground, 2,000-gallon, storage tank. CMS treated contaminated soil on, installed five perimeter bedrock groundwater monitoring wells and four monitoring/extraction wells at the source location, and installed a groundwater extraction/treatment system (GWE/TS) to arrest the spread of contamination. CMS installed two additional off-site monitoring wells in 1998.

In January 2005 the NYSDEC reclassified the site from Class 2 to Class 4, CMS installed two sub-slab depressurization systems in a portion of the 210 French building, and Cugini Ventures LLC purchased the property. CMS still owns and operates all remediation equipment, and installed five additional monitoring wells in 2010 (2,) 2011 (1,) and 2015 (2,) and in 2015 it enlarged and improved the SSDS system.

The adjacent Rosina Food Products, Inc. has leased the property since 2005 and currently warehouses packaging/shipping materials, new parts, maintenance supplies, and used mechanical equipment and parts, and in 210 French Road building.

1.2 Nature and Extent of Contamination

The complete range of compounds in the UST was not characterized before it was excavated, but the waste apparently contained fuel products, and chlorinated hydrocarbon solvents and other VOC compounds. While removing the LUST, it was evident that an unknown volume of the contents had leaked both into the surrounding soil and onto the bedrock surface on which the UST was installed.

The LUST had contaminated about 350 tons of soil, and subsequent groundwater monitoring revealed that VOCs had entered the bedrock groundwater regime. Compounds observed in the monitoring wells consisted of mostly dense chlorinated solvents, dense insecticides and pesticides, dense refrigerants and halogens, light gasoline-related petroleum hydrocarbons (BTEX,) aromatic hydrocarbons, and some light chlorinated solvents. Nearly 50 VOC compounds have been identified, although not all are observed in every well, and total VOC concentrations vary by orders of magnitude between the monitoring wells.

Site characterizations soon after the LUST and contaminated soil were removed revealed that contamination had reached the five perimeter monitoring wells and likely extended offsite, especially toward the northwest and east. The extent of the contaminate plume was undetermined at that time, however.

Subsequent monitoring confirmed that contamination extending off site is primarily toward the northwest, east, and southeast. Contamination at considerably lower VOC concentrations extends relatively short distances beyond the west, north, and south property lines.

1.3 Remedial History and Effectiveness of the Program

Four Remedial Measures were initially chosen for the Site:

1. Removing and properly disposing of the LUST to eliminate the contamination source.
2. Excavating the treating the surrounding contaminated soil on-site.
3. Installing a vacuum-enhanced, multi-phase groundwater extraction and treatment system (GWE/TS) to help control the groundwater contaminate plume.
4. Imposing Institutional Controls (deed restrictions on the use of the property) to minimize the potential for human contact with contaminates.

Additional Remedial Measures instituted were:

5. Installing two sub-slab depressurization (trench) systems in a portion of the 210 French building in 2006.
6. Enlarging and improving the SSDS systems in 2015 to cover a larger building footprint.

The first two IRMs had reduced the Total VOC concentrations in the site perimeter monitoring wells by up to 98-percent.

The GWE/TS system was installed in an outdoor shed and began operating in June 1998, but a December 1999 fire in the shed destroyed the equipment and CMS relocated the replacement inside the 210 French Road building. It went back on line in April 2000, but for the first ten years the extraction system had not operated as it was had been designed and specified—so it likely never reached its full potential to help control the contaminant plume. However, the extraction wells were retrofitted to the correct design arrangement and the revised system was placed back in service in April 2010.

The GWE/TS has helped to decrease VOCs at the perimeter wells, but the magnitude of the improvement is mixed—some wells exhibit significantly greater reductions than do others. In particular, the highest VOC concentrations remain in the perimeter wells to the east and southeast of the LUST location. In the perimeter wells where we have 1996 post-LUST-removal data, total VOCs have been reduced by a range of 32% to 99%.

The two sub-slab depressurization systems were installed in 2006 subsequent to soil vapor intrusion sampling. Additional SVI evaluations were prepared for selected surrounding buildings and for the 210 French building in 2013 and 2014 respectively. No SVI issues were discovered in off-site buildings so no remediation was required. The 210 French building SVI evaluation revealed that the indoor air contained only low-level VOCs, and that the two SSDSs remediated about 80% of the building footprint that exhibited above-action-level VOCs. In 2015, the existing SSDS was improved by installing additional sub-slab suction points, two new roof-mounted blowers, connecting suction manifold piping, and blower controllers. Subsequent testing and ongoing monitoring of sub-slab negative pressure demonstrates that the SSDS attains the remedial objective.

Progress Made Toward Meeting the Remedial Objectives of the Site

The remedial objective of controlling vapor intrusion into the 210 French building has been attained.

The remedial objective of reducing the spread of contamination is being met and the RMs have arrested further spread of the plume. Because the extraction wells were retrofitted and reconfigured after more than a decade of the GWE/TS operating incorrectly, we are using 2011 as a baseline year to evaluate the success of that RM on media contamination. There has been a reduction in the groundwater plume since that baseline, and ongoing groundwater monitoring indicates that VOC concentrations at the plume extent continue to decrease, albeit at different rates depending on the location.

Although the function of the GWE/TS RM is to control the contamination plume (not treat the plume itself) it has additionally helped to reduce groundwater VOCs both on and off-site by removing contaminate mass at the source area that would otherwise contribute to the groundwater plume. Recent modeling of the GWE/TS zone of influence indicates that the system intercepts about 1/3 of the groundwater contaminant plume. However, the mass of contamination that is captive in the rock pores versus the fraction is free to move away from the source via dispersion and diffusion is undetermined.

Ability of the Remedial Program to Achieve Remedial Objectives for the Site

The Institutional Controls have achieved their remedial objectives to minimize the potential for human contact with contaminants.

The SVI remediation of the 210 French building has achieved its remedial objective.

The GWE/TS is effective in helping to reduce groundwater VOCs but its efficiency is controlled by the tight bedrock and low transmissivity.

Historical groundwater level monitoring indicates that the GWE/TS cannot maintain a depressed level in the extraction wells during and soon after high precipitation and snowmelt. Otherwise, the system effectively lowers the groundwater surface proximate to the extraction wells. There has been a persistent natural "groundwater mound" at the LUST location since the remediation effort began (see March 2000 *Record of Decision*.) The low transmissivity of the bedrock and relatively low volume of groundwater extracted, indicates that the induced zone of depression and vacuum enhancement may not move great amounts of *surrounding* contamination toward the extraction wells. Nevertheless, the GWE/TS is effective in capturing and removing VOCs from the bedrock groundwater at the former LUST location proper. It also intercepts the upgradient contaminant plume that could otherwise migrate northerly (groundwater down-gradient direction) and off site. Recent modeling to determine the GWE/TS zone of influence indicates that, at best, the system intercepts 1/3 of the upgradient contaminant plume.

1.4 Site Management Plan

The 2015 *Site Management Plan* incorporates the remedial effort, and it will be updated during 2019 to reflect installing MW-15 and MW-16, repairing and reestablishing MW-5 in fall 2018, and other relevant site information.

1.5 Compliance with the Institutional Controls

In the past CMS has complied with, and the current property owner complies with, the Institutional Controls and no change in the ICs is necessary.

1.6 Compliance with the Engineering Controls

CMS continues to comply with operating the SSDS in the 210 French building and the site GWE/T System Engineering Controls.

The site inspections show that as of December 2018 all groundwater control systems are operating as intended. In fall 2018 the GWE/TS lost all vacuum when Rosina's lawn maintenance company hit and cracked a PVC riser on the vacuum manifold about 3-feet belowground. This was immediately repaired by a CMS contractor once we determined the cause of the vacuum loss.

In fall 2018, our inspection discovered a leak in a SSDS in the 210 French Road building, where the floor slab was apparently damaged due to a suction drop pipe being hit during warehouse forklift operations. CMS reported this to Rosina Food Products and the slab/vacuum leak was repaired by maintenance staff. Otherwise, the system operated exceptionally well during the reporting period.

1.7 Recommendations Based on Engineering Judgment for Necessary Changes to the Remedy, Engineering Controls, or Site Management Plan

1. Update the *Site Management Plan* as necessary.

   Continue monitoring shallow well MW-16 to evaluate whether perched groundwater being recharged from permeable areas north of the 210 French building contributes to the "groundwater mound" that persists in the area of the former LUST.
   (Ongoing effort)

2. Temporarily discontinue groundwater extraction as discussed with the NYSDEC to allow additional site groundwater and contamination characterization without being influenced by the manipulated groundwater level. (Ongoing; since May 23, 2019.)

   Monitor groundwater quality and coordinate with the NYSDEC during the temporary GW extraction shutdown to assure there are no substantive groundwater quality impacts.
   (Ongoing effort)

3. Update the tabulation of historical groundwater elevations based on the new elevation survey that was done for the entire site.

4. Prepare a top-of-bedrock elevation map using the new elevation survey and the previous depth-to-bedrock probes to help determine:
   a. The route contaminants from the LUST may have taken when travelling across the bedrock surface.
   b. How bedrock micro-variability may impact the recharge of bedrock groundwater in the area around the former LUST.

5. Investigate the blockage in the suction line at well MW-2 and whether it can easily be removed.

The following addresses data gaps and their sequencing is based on CMS's financial resources.

6. Closely watch monitoring wells MW-14 and MW-15 to determine if an off-site well on Boxwood Drive is warranted to determine the extent of the contaminant plume to the east of the 210 French building.
(Ongoing.)

7. Using existing information and measured bedrock hydraulic conductivity, determine the contaminant mass flux across and the mass discharge off site.
(Pending outcome of site evaluations during the temporary GWE/TS shutdown.)

8. Evaluate the plume stability and the fate of VOC parent/daughter compounds to determine historical trends and the natural attenuation of contaminants. The goal being to further refine the *Conceptual Site Model,* and to identify and evaluate any further improvements to the GWE/TS that could enhance its ability to collect VOCs and control the contaminant plume.
(Pending outcome of site evaluations during the GWE/TS shutdown.)

9. Evaluate an optimized GWE/TS against a Monitored Natural Attenuation option.
(Pending outcome of site evaluations during the GWE/TS shutdown.)

10. Evaluate if a more-aggressive RM is warranted. Methods that might be considered are ISCO by applying electron-donor or other catalysts to enhance VOC biotransformation and dechlorination, accelerated groundwater flushing by injecting the GWE/TS effluent, or using thermal destruction to degrade groundwater contaminants.
(Pending outcome of site evaluations during the GWE/TS shutdown.)

II SITE OVERVIEW

2.1 Site Location and Features

The CMS Associates Remediation Site contains 3.74 acres at 210 French Road in Cheektowaga, NY, east of Union Road (NYS Route 277.) French Road and Industrial Parkway border it on the south and north (see Figure 1 for location.) It contains a single-story, 44,750-square-foot, concrete slab-on-grade, masonry-block building, and a large asphalt and gravel parking lot—sections of which have had new bituminous overlays and spot repairs over the years since the LUST removal.

The following property uses currently surround the CMS Remediation Site (see Figure 2):

- Northwest — Latina Food Services warehouse/distribution center
  1 Scrivner Drive (across Industrial Pkwy)
- North — UPS Supply Chain distribution center
  60 Industrial Parkway (across Industrial Pkwy)
- North — Rosina Food Products Customer Welcome Center
  109 Industrial Parkway
- Northeast — Vacant Commercial (Uni-Punch, Inc.)
  56 Boxwood Lane
- East — South Line Fire District #10 station
  40 Boxwood Lane
- East — Absolute Canine (pet boarding/daycare)
  240 French Road
- South — Residential (Patio Homes)
  (across French Rd along Hickory Grove)
- West — Commercial
  Rosina Food Products, Inc.
  170 French Road and 75 Industrial Parkway

Utilities on the site include underground public water and natural gas, and aboveground electricity, telephone, and cable TV. There are no known potable water wells or other groundwater supply wells in the area, and there were no features on or near the site to indicate any material risk for public contact with groundwater contaminants.

Figure 3 depicts the surrounding land uses, which consist of:

- Commercial/light industrial/warehousing to the west, north, and east.
- Multi-family apartments to the southwest.
- A newer single-family patio home development to the south.
- Established single-family neighborhoods to the southeast.
- No nearby public-use areas that present a risk of exposure to groundwater contaminants.

The nearest watercourse is Slate Bottom Creek (Class C, ~1,900 feet to the north-northeast,) a tributary of Cayuga Creek (Class B and Class C.) There are no state-regulated wetlands within one-mile of the site, but there are several narrow linear US Fish and Wildlife Service *National Wetland Inventory* sites along Slate Bottom Creek and Cayuga Creek.

The site grade drops four feet from French Road (627.5') to Industrial Parkway (623.5',) and local surface drainage mirrors the topography. Runoff is overland, and intercepted and transported by open roadside ditches with driveway culverts and a storm sewer on Industrial Parkway. A drainage swale north of Industrial Parkway carries runoff north to Slate Bottom Creek (see Figure 3.)

2.2 Nature and History of Contamination Prior to Remediation Effort

According to CMS, a former tenant installed a UST in the 1960s for a vehicle fuel supply and later abandoned it. Presumably, at some unknown point(s) in time, a tenant disposed of chlorinated solvents in the UST as either a one-time event or a continuing practice.

In April 1996, CMS disposed of approximately 1,810 gallons contained in the UST, and then excavated the tank and found it compromised. The contents had leaked into the surrounding soil and onto the bedrock surface upon which it was installed.

CMS began a Remedial Investigation and initial groundwater sampling at the site perimeter revealed that contamination extended beyond the property boundary. The highest VOCs were toward the northwest (MW-5 at Industrial Parkway; TVOCs ~5,000 ppb) and toward Boxwood Lane to the east (MW-7; TVOCs ~1,500 ppb.) No off-site monitoring was performed at that time.

2.3 Selected Remedial Program for the Site

Two out of the five total remedial measures for the CMS Site were successfully completed, and three are ongoing. There were initially four RMs chosen:

1. The contamination source (LUST) was removed in April 1996 and properly disposed of off site.

2. About 350 tons of contaminated soil was excavated, treated on site until it met NYSDEC TAGM 4046 guidance values, spread on the lawn north of the building, and then graded, topsoiled, and seeded.

3. A vacuum-enhanced, multi-phase groundwater extraction/treatment system (Carbtrol Corporation model MPX-75) was installed to in 1998 to reduce the spread of the contaminate plume. Wells MW-1, -2, -3, and -9, are manifolded to the system and RI reports from 1996 and 1997 discuss the anticipated levels of VOCs to be treated. However, there apparently was no evaluation of how bedrock/groundwater well elevations would affect the system, the production from the proposed extraction wells, the location/elevation of the proposed GWE equipment, or anticipated ability to extract groundwater and contaminants from the tight bedrock. The GWE/TS operated continuously (24/7) during the reporting period.

4. Institutional Controls (Deed Declarations) were placed on the property to minimize the possibility for human contact with the contaminants. They are effective and remain in place.

2.4 Additions to the Original Remedial Program

2.4.1 210 French Building Sub-Slab Depressurization Systems Engineering Controls

This fifth ongoing RM was instituted in 2006 after sampling showed high VOCs under portions of the building footprint and low-level VOCs in the indoor air at the 210 French building. Two independent sub-slab depressurization systems were installed inside the northwest corner (nearest the LUST) and nearer to the east wall of the building, and both operated uninterrupted until 2015.

In 2015, adding additional sub-slab suction points and two new roof-mounted blowers were added to enlarge and enhance this RM. Additionally, several locations in the building received passive remediation (sealing cracks in the concrete floor slab, open wall/slab joints, and floor slab penetrations.) CMS currently operates the SSDS continuously (24/365.)

2.4.2 Additional Groundwater Monitoring Wells

The initial remedial program included long-term monitoring at five site perimeter bedrock wells (MW-4, -5, -6, -7, -8) and four extraction bedrock wells (MW-1, -2, -3, -9) at the former LUST location.

In 1998, off-site monitoring wells MW-10 and MW-11 were installed toward the north and northwest, respectively. In 2010, off-site bedrock wells MW-12 and MW-13 were installed to the northwest and north respectively, and in 2011, a sixth bedrock perimeter well (MW-14) was installed on the east property line.

In 2015, the seventh perimeter bedrock well (MW-15) was installed near the southeast corner of the site, and a shallow well to top-of-bedrock (MW-16) was placed north of the 210 French building.

III PERFORMANCE of the REMEDIAL MEASURES

3.1 Conceptual Site Model

The refinements to the *Conceptual Site Model* during the reporting period were

- The addition of the newest wells MW-15 and MW-16.
- Adjusting the depicted zone of contaminants from the tank to better reflect the extent of the original plume (see Figure 4) and
- The results of Groundwater & Environmental Services modeling the zone of influence (VOC capture) of the GWE/TS (see Appendix E.)

Due to the just recently completed modeling effort and including those results herein, further evaluation and consideration of the capture zone will be discussed in the next PRR.

Additional investigation is proposed for the Site (see Section 1.7, Recommendations)—the result of which will be incorporated into and help refine the *CSM*.

The CSM graphic (see Figure 4) depicts a north-south cross-section of the Site from north of Industrial Parkway to French Road, running approximately through MW-1. Well locations are plotted perpendicular to the profile baseline. For reference, groundwater levels that the consultant at the time reported (17 months after CMS removed the LUST) are depicted at each well location.

3.2 Performance of Groundwater Extraction in Controlling the Piezometric Surface

According to the 1997 RI report, the GWE/T System was installed to control the movement of the contaminant plume toward offsite using "shallow groundwater pumping" and applying a vacuum on the bedrock in the vicinity of the former LUST. The 1996-1997 RIs discuss neither the anticipated ability of the GWE/TS to lower the piezometric head, nor its expected zone of influence in the tight shale and limestone bedrock. There was also no discussion of what elevation pumping was expected to lower the groundwater surface to, or the anticipated effect pumping would have on the observed groundwater gradient across the site. The system has also gone through major pumping modifications over the years so it doesn't reflect the original installation.

Therefore, we measure system performance against what it "can do," rather than what it might have been "expected to do" when first installed. The GWE/TS operated exceptionally well during the reporting period, and during dry weather it is typical to see the groundwater elevation at MW-9 and MW-3 at or near the bottom of the wells. MW-2 was out of service during the period.

During the reporting period, the GWE/TS was set to extract groundwater continuously (i.e., operate 24/7) and the digital controller installed in spring 2015 to independently control the extraction and treatment times of the GWE/TS was not used. While unrelated to the groundwater levels, no treatment of the extracted groundwater was necessary because air sparging that occurs in the extraction wells reduces the VOCs to well below the discharge permit limits.

While the GWE/TS can easily draw down the groundwater level in the extraction wells during dry weather the system cannot keep up with long periods of wet weather or high snowmelt.

During the reporting period the GWE/TS in the "Carbtrol room" of the building was typically checked daily—and the extraction system vacuum, treatment system run time, effluent pump run time, and maintenance items are recorded in a logbook. The only significant downtime was two months in fall 2008 when vacuum was completely lost on the suction manifold to the wells. This was immediately repaired once the cause was determined (Rosina's lawn maintenance contractor had hit a PVC riser/cleanout and cracked it 2-3 feet belowground.) There were no other major repairs to the pumping or treatment equipment and only normal maintenance was provided (e.g., air compressor oil and oil filter during annual preventive maintenance, replacing air regulator filters, etc.) However, we took advantage of the system downtime to clean and replace some inside piping on the suction manifold.

The extraction pump and the spare standby pump continue to require high maintenance due to scale deposited from the groundwater, and they are serviced whenever required (cleaning/descaling, replacing diaphragms, valve balls, etc.) They required rebuilding during the reporting period—which is typically an annual occurrence.

The GWE/TS was installed with a single, underground, suction manifold connecting the extraction wells to the pumping equipment inside the building—so losing vacuum at one well can affect entire system performance. Maintaining constant/consistent vacuum on the extraction well network was typical unless an issue arose with an extraction pump, but such occurrences/downtime were minimized by more-intensive preventive maintenance and daily checking of the vacuum/pump operation.

Likewise because the GWE/TS is tied together via one suction manifold, from a system maintenance/repair standpoint a leak in that manifold, or between it and any extraction well, will affect performance of the entire system.

Observations and Conclusions Regarding the Groundwater Surface

We use 2011 as the baseline condition to evaluate the GWE/TS performance because, only after the extraction wells were rebuilt and reconfigured and put back on line in 2010, has the RM operated as it had been designed and intended. Additionally, after 2011 key groundwater quality data is available from MW-12, MW-13, and MW-14. Figure 5 shows groundwater conditions for the baseline period.

Retrofitting the groundwater extraction wells was a positive step because the system can significantly lower the groundwater level in the extraction wells.

The following are observed relative to the "groundwater mound" at the LUST source area:

- Adjacent to the east and northeast is a substantial permeable lawn area, which accepts roof runoff from the 210 French building, and likely contributes to short-term perched groundwater, and subsequent localized, rapid recharge to the bedrock groundwater.

- Most of the surface on and adjacent to the CMS Site is impervious (parking lot and building footprint) so those areas would not contribute to groundwater recharge.

- There appears to be micro variability in the top-of-rock, so perched groundwater moving across the bedrock surface could pond at certain locations and contribute to the bedrock groundwater recharge. This will be evaluated further with the complete resurvey of the site and the previous top-of-bedrock probes.

- Excavating and backfilling the former LUST and contaminated soil areas likely had increased the permeability of the overburden, allowing more perched groundwater to migrate into and pool on top of bedrock in that area.

The above support our hypothesis that the "groundwater mound" is due to local recharge in the area of the extraction wells. The bedrock in that vicinity could also have greater fracturing—which would contribute to more rapid recharge than at other areas of the site.

Accurate static groundwater levels in wells that have applied vacuum are problematic in determining the site groundwater gradient because their water surface is artificially depressed. Therefore, one extraction well is sometimes isolated from the GW/TS vacuum manifold to use it as a control to determine the static groundwater level at the extraction well field. That was typically MW-3, but MW-2 has been out of service because the PVC suction line to the suction manifold became clogged. Therefore MW-2 remains disconnected from the GWE/TS and was used to monitor the static groundwater.

Groundwater elevation monitoring at MW-4 continues to show significant differences between it and other groundwater elevations on the site, and the significantly different groundwater elevations continue to suggest a discontinuity in connectivity to the other wells.

Referencing the CSM (Figure 4) it is obvious that the lower the piezometric surface that the GWE/TS can consistently maintain, the more effectively it can capture groundwater contamination. However, lowering the level in the extraction wells has a greater effect on the groundwater gradient to the south (the up-gradient side of the site,) than it does to the north (the down-gradient direction.) Conversely stated, the groundwater surface at the extraction wells would need to be greatly depressed in order to have a significant effect in the northerly direction toward which the plume had historically migrated. The GWE/TS zone of influence shown in Appendix E confirms this.

Therefore, it is critical to maintain the maximum vacuum possible at the extraction wells—but this is affected by the shallower depth of extraction wells MW-1, -2, and -3. Compared to the ~20-foot depth of MW-9, the shallower wells limit the ability of the GWE/TS to draw down the groundwater surface.

Additional Investigations To Address Issues Regarding Groundwater Control

The RIs described in Section 1.7 may help answer these unknowns about the groundwater regime:

1. Why the groundwater mound persists at the extraction wells.
2. Why anomalies exist in the groundwater elevations at MW-4.

With the concurrence of the NYSDEC, groundwater extraction was temporarily ceased in May 2019 to allow additional RIs into groundwater levels and VOC concentrations at the source area without the on-site monitoring wells being influenced by artificial manipulation of the groundwater surface. Both groundwater elevation and quality sampling will continue during this evaluation period. These results will be monitored and used to determine when the groundwater extraction can or should be reinstated.

3.3 Performance of Groundwater Extraction in Controlling the Contaminant Plume

Presumably, the intent of installing the GWE/TS and lowering the groundwater levels, was additionally to capture contaminates residing in the source area, and to create an unspecified zone of influence around the LUST source area (well extraction field MW-1, -2, -3, -9) to capture additional contaminated groundwater.

The recent evaluation of the GWE/TS zone of influence by Groundwater & Environmental Services (see Appendix E) indicates that, when operating at peak efficiency, the extraction can intercept about one-third of the up-gradient contaminant plume. It does not appear that the system can essentially "draw back" down-gradient contamination. However, even if the system does not affect the down-gradient plume, extracting groundwater from the source area will still help reduce VOCs at the site boundary and beyond. We believe that this is the primary benefit of operating the GWE/TS on this site.

Pursuant to a request to and after discussion with NYSDEC Region 9, CMS temporarily discontinued extraction in May 2019 to assist in further site characterizations. This will allow evaluations of groundwater movement and the impact on VOC levels without the groundwater being artificially manipulated by the GWE/TS.

Observations Regarding Control of the Contaminant Plume

Appendix A and Appendix B summarize the VOCs observed in the groundwater extraction wells (MW-1, -2, -3, -9,) perimeter wells (MW-4, -5, -6, -7, -8, -14, -15,) and off-site wells (MW-10, -11, 12, -13) since implementing the RMs and reconfiguring the extraction wells. In reviewing the groundwater VOC concentrations and Figure 7, it appears that expansion of the contaminant plume has been arrested and the outside limits of the highest VOC levels continue to contract.

While the RMs have reduced the initial Total VOCs that were observed in the perimeter wells, compared to the wells in other locations the levels remain problematic toward the southeast (MW-14,) where the highest concentrations remain. Nevertheless, the trend of the areal extent and contaminant density of the plume (see Figure 7 and Figure 8) indicates that it is under control, and the trends of total VOC concentrations (see Appendix B) in wells south (up-gradient) of the LUST source area continue in a downward trajectory (though less significantly at MW-14.) We anticipate both those trends to continue over the long term, despite if short-term variances occur during future groundwater sampling events.

The retrofitted GWE/TS aspect of the RMs appears to have had contributed to the reduced VOC concentrations in the perimeter wells (except MW-6) and off-site wells, and likely also in arresting the spread of the plume. And as noted above, concentrations at MW-14 are reducing—but at a slow rate.

The VOC concentrations at MW-14 are higher than what is currently observed in wells at the source area. Being on the upgradient side of the source, those higher VOC levels are consistent with the *CSM*'s depiction of the tank contents having migrated to the south, across the top-of-bedrock. At some point, contaminated perched groundwater would have encountered vertical fractures that allowed it to enter the bedrock groundwater.

3.4 Mass of Groundwater Contaminates Removed and Treated

The GWE/TS removes VOC product and contaminated groundwater from the immediate vicinity of the former LUST—which removes those contaminants from what could migrate toward the site boundary. The treated effluent has consistently been below the discharge limit of 155 µg/l of the Erie County/Buffalo Sewer Authority permit.

Observations Regarding Groundwater Contaminants Removed

During the reporting period, any GWE/T System downtime includes days the system was off for cleaning, pump servicing, annual compressor preventive maintenance, etc. There were no extraordinary equipment failures or replacements on the system itself, with only normal service needed on the primary and backup groundwater extraction pumps. The only significant GWE/TS downtime was in fall 2008 when vacuum was completely lost between the time the lawn maintenance contractor hit a PVC riser and cracked it off 2-3 feet belowground, and when we determined the cause and CMS immediately repaired it.

The GWE/T System was set to operate continuously (24/7) during the reporting period.
Since the system was installed in 1998, we estimate the following performance:

Reporting Period	CY 2018
GWE/T System operated	342 days
Mass VOC removed for year, lbs	0.370
Cumulative VOC mass removed, lbs	45.882
Groundwater volume extracted, gal	62,000
Cumulative extracted, gal	1,015,594

The discharge of the treated groundwater is calculated on a monthly basis, the average daily flow typically varies between 20 gpd to 500 gpd.

There is no historical data available to compare removals to the VOC mass that was released from the LUST to the soil, bedrock, and groundwater. Nevertheless, the estimates allow a comparison of relative ongoing performance of the GWE/T System.

3.5 Current Extent of Groundwater Contamination Plume

During the reporting period, contamination extended to all perimeter wells and to the off-site well toward the northwest (MW-12.) Nearby off-site well MW-13 has been non-detect and is used to determine the extent of the contaminant plume. The current estimated extent of the contaminant plume is shown by Figure 8.

Observations Regarding Extent of the Contaminant Plume

Figure 8 depicts the current iso-concentrations showing the estimated extent of the groundwater contaminant plume during the reporting period. The six bedrock monitoring wells that were most recently added to the Remedial Program have been invaluable in helping to define the limit and density of the plume.

The indication from the cumulative groundwater sampling program, is that the extent of the plume continues to reduce, compared to baseline year 2011 (see Figure 7.) However, due to the wide spacing of wells south of the LUST source area, the plume representation in that area is considered overly conservative. Caution should be used when interpreting the depicted contamination zones, and the plume limits should be considered approximate.

The number of *contaminants of concern* (n ~50) makes it unwieldy to include tabular data of the sampling results on a single well location map—so we tabulated the results in Appendix A. Appendix B contains a graphical analysis of each monitoring well since the date that the original contamination sources (LUST and soil) were removed, since the period after the GWE/TS Remedial Method began operating, and the period to date after the extraction system and four extraction wells were reconfigured.

Additional Investigations to Address Issues Regarding Contaminant Plume

The chosen RMs had not been as effective in controlling the contaminant plume quickly as may have initially been anticipated because the GWE/TS never operated as intended until April 2010, and therefore it never reached its full potential to control groundwater levels and the plume.

To address the high VOCs at MW-14, MW-15 was installed to help establish the limit of the groundwater plume toward the east and southeast. An additional well may be warranted in the future to establish the extent and/or movement of the plume to the east and the ongoing monitoring at MW-14 and MW-15 will assist in making that determination.

See Section 1.7 for a summary of additional RIs that are anticipated.

IV COMPLIANCE with SITE INSTITUTIONAL and ENGINEERING CONTROLS

4.1 Compliance with Institutional Controls

The Institutional Controls to limit potential human exposure to the contaminants were filed as a Deed Declaration that runs with the land and precludes the owner from using:

- Groundwater from beneath the CMS Site without treatment first to render it safe.
- The property for anything other than commercial or industrial use.

CMS, Cugini Ventures, and Rosina Food Products (the site occupant) all continue to comply with ICs, which have attained their intended remedial objective, and no modifications or additions are anticipated.

4.2 Compliance with Engineering Controls

The ongoing engineering controls consist of (1) operating the GWE/T System RM, and (2) operating the SSDS in the 210 French Building.

Groundwater Extraction and Treatment System

CMS continues to own and operate the GWE/TS EC, which has continued to operate during the reporting period substantially as designed according to the specifications for the system supplied by the equipment manufacturer and specified by Hazard Evaluations, Inc. in the 1996 and 1997 RIs.

Description of Performance Monitoring

The operation and performance of the system is checked daily and the vacuum in the suction manifold that is imparted on the extraction wells is recorded in a logbook. During the reporting period, the equipment operated exceptionally well, without significant/unusual issues.

The performance of the treatment portion of the system in stripping VOCs is determined by compliance sampling required by the Erie County/Buffalo Sewer Authority permit for the effluent discharge to the sanitary sewer system. It was unnecessary to operate the treatment (VOC stripping) portion of the system during the reporting period, because air sparging that occurs in the extraction wells significantly reduces the VOC concentrations and consequently the treatment system effluent is consistently well below the EC/BSA permit limits. The semiannual compliance reports are filed with the NYSDEC Region 9 DER and additionally, the effluent is typically sampled when groundwater wells are sampled.

The ability of the GWE/TS to control VOCs in the down-gradient contaminant plume is determined by groundwater sampling and the concentration of VOCs in those site perimeter and off-site wells. The plume has been receding since the reconfigured extraction wells came on line in April 2010. What is undetermined, however, is what portion is due to the GWE/TS removing VOCs from the source area versus natural attenuation of VOC compounds in the plume.

Routine Maintenance and Inspections

Any maintenance is recorded in the daily inspection logbook that also documents system performance, and additionally all shop tickets and repair reports are maintained on file. The daily readings are reviewed to identify trends such as low vacuum or a persistent maintenance condition. See the logbook submitted separately with the PRR for the GWE/TS performance.

When appropriate (depending on the cause and the effect on the system,) the extraction wells are checked if a problem is recognized such as lost vacuum on the suction manifold or if an unusual condition develops with the extraction pump. The frequency of these inspections is adjusted as necessary if any issue affecting system operation or performance arises.

Adjustments to the extraction system (e.g., air compressor and pump operation, vacuum applied to the suction manifold, well vacuums) are performed as needed.

During the monitoring period these adjustments, maintenance, and repairs were made on the GWE/TS:

- Annual preventive maintenance on the Atlas compressor that drives the groundwater extraction pump.
- Adjusted the compressor to both a lower cut-out pressure and wider operating range to have the system run more efficiently, and to reduce energy usage, operating hours, and wear on the compressor.
- Replaced the pressure regulator on the compressed-air supply line to the extraction pump.
- Replaced condensate auto-drain valves on both compressed-air storage tanks.
- Replaced a failed sump pump in the GWE/TS effluent tank.
- Cleaned and replaced portions of the interior suction manifold piping.
- Removed a stuck check valve from the suction manifold.
- Cleaned the ball valve on the suction manifold of groundwater scale.
- Serviced one of the groundwater extraction pumps.

210 French Building SVI Remediation Systems

The two SSD Systems installed in the 210 French building are operating as they were intended and meet the remedial objectives.

Description of Performance Monitoring

Performance monitoring of the SVI remediation systems in the 210 French Road building is recorded in the same logbook as the GWE/TS. See the logbook submitted separately with the PRR for the SSDS performance.

Routine Maintenance and Inspections

The routine inspection forms consists of the daily logbook that documents the SSDS system performance. Other standard forms may be prepared in the future if regular maintenance on the system becomes necessary.

During the monitoring period the following adjustments, maintenance, and repairs were necessary:

- Repair of the concrete floor slab where one suction drop pipe became dislodged and there was a vacuum leak, apparently when hit during warehouse forklift operations.

V COMPLIANCE with SITE MANAGEMENT PLAN

5.1 Status of SMP

The SMP was updated in 2015 to reflect the RM components and the Engineering and Institutional Controls. It needs minor updates to include new monitoring wells and other site information.

5.2 Monitoring to Determine Treatment System Performance and Effectiveness

Effluent from the GWE/TS is discharged under an Erie County/Buffalo Sewer Authority permit that requires semi-annual compliance monitoring. The reports are also submitted to Region 9 DER as PDFs, and the EDDs are uploaded to the EQuIS database.

Since the GWE/T System went on line in 1998, the effluent has consistently been well below the permit limits and oftentimes VOCs have been non-detectable using EPA Method 625 for wastewater (as provided for in the discharge permit.) More recently, effluent has bees analyzed using the lower-detection-limit Method 8021 for groundwater, and currently Method 8260. Using any of the three test methods, the discharge to the sanitary system is typically an order of magnitude below the permitted 1.55 mg/l.

We sampled the GWE/TS effluent these times during the reporting period:

Date	Total VOCs GWE/T System Effluent (µg/l)
March 21, 2018	467.81
June 29, 2918	51.84
October, 3 2019	ND
December 28, 2018	526.9

Permitted discharge limit is 1,550 µg/l

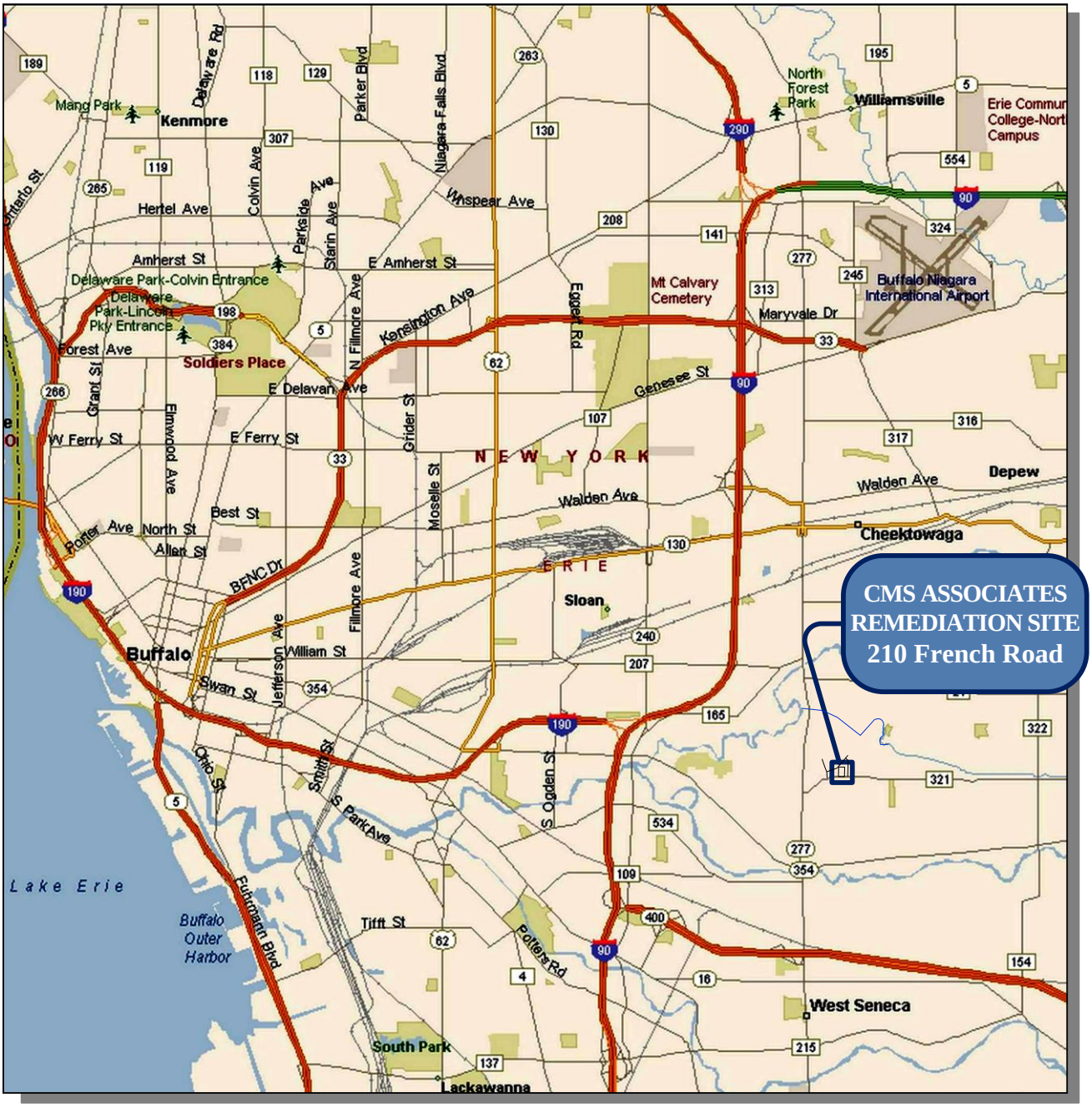
5.3 SVI Remediation System Monitoring

The SSD Systems in the 210 French building are monitored to ensure that the sub slab maintains a negative pressure, and the results are recorded in a logbook maintained in the GWE/TS equipment room ("Carbtrol Room".) During the reporting period, the SSD Systems have operated as designed and are meeting the Remedial Objective.

5.4 Groundwater Elevation and Quality Monitoring

Appendix A summarizes the results of groundwater monitoring—and no change is recommended in the sampling plan or the analyte list (see Appendix C.)

FIGURES

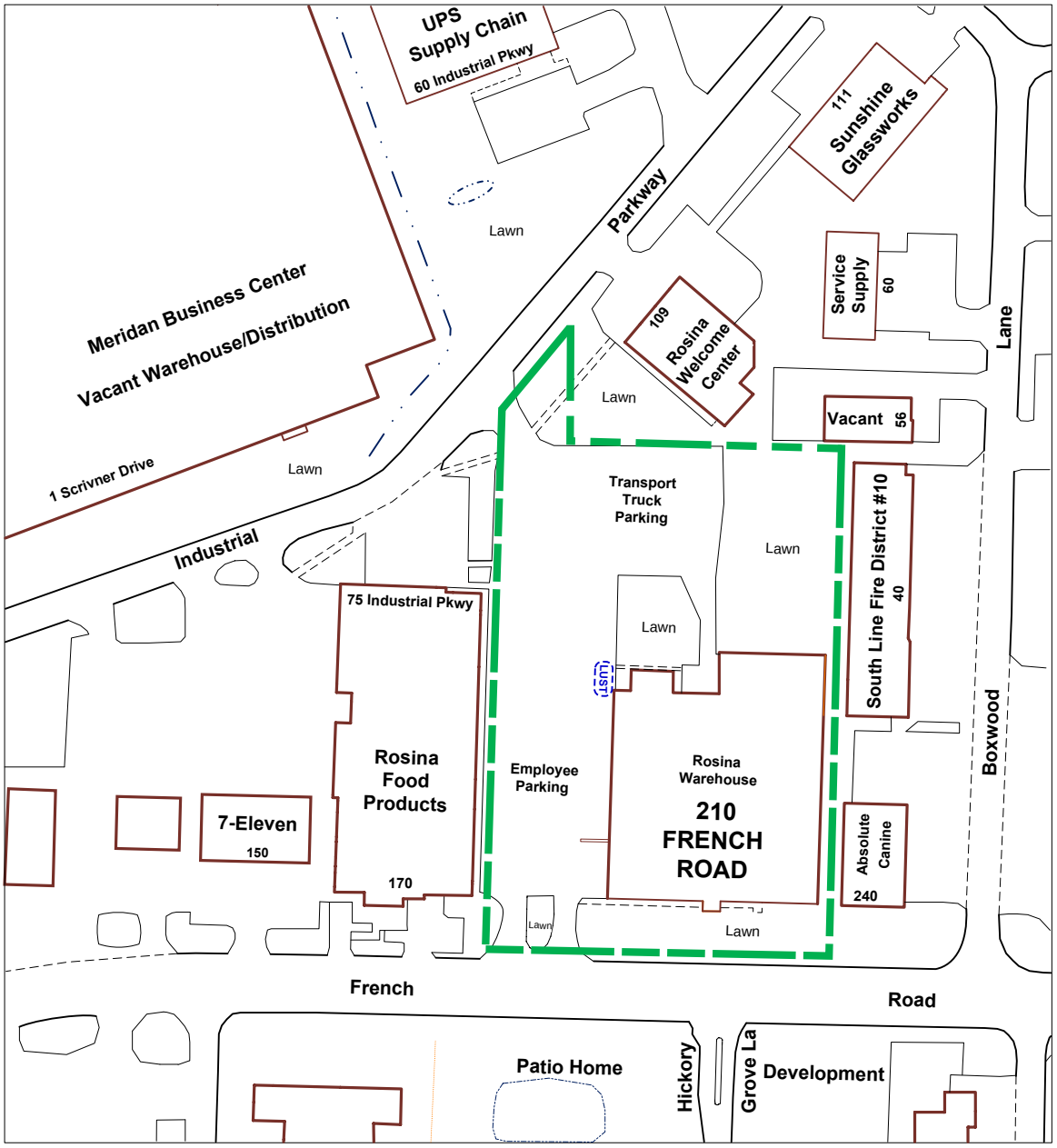


CMS Property Associates Remediation Site
Periodic Review Report

Figure 1

SITE LOCATION

Ken W. Kloeber Consulting Engineers



Key:

LUST — *Former LUST Location*

CMS Site Property Boundary

N

0 60 100 200

Approximate Feet

CMS Property Associates Remediation Site
Periodic Review Report

Figure 2

Surrounding Properties

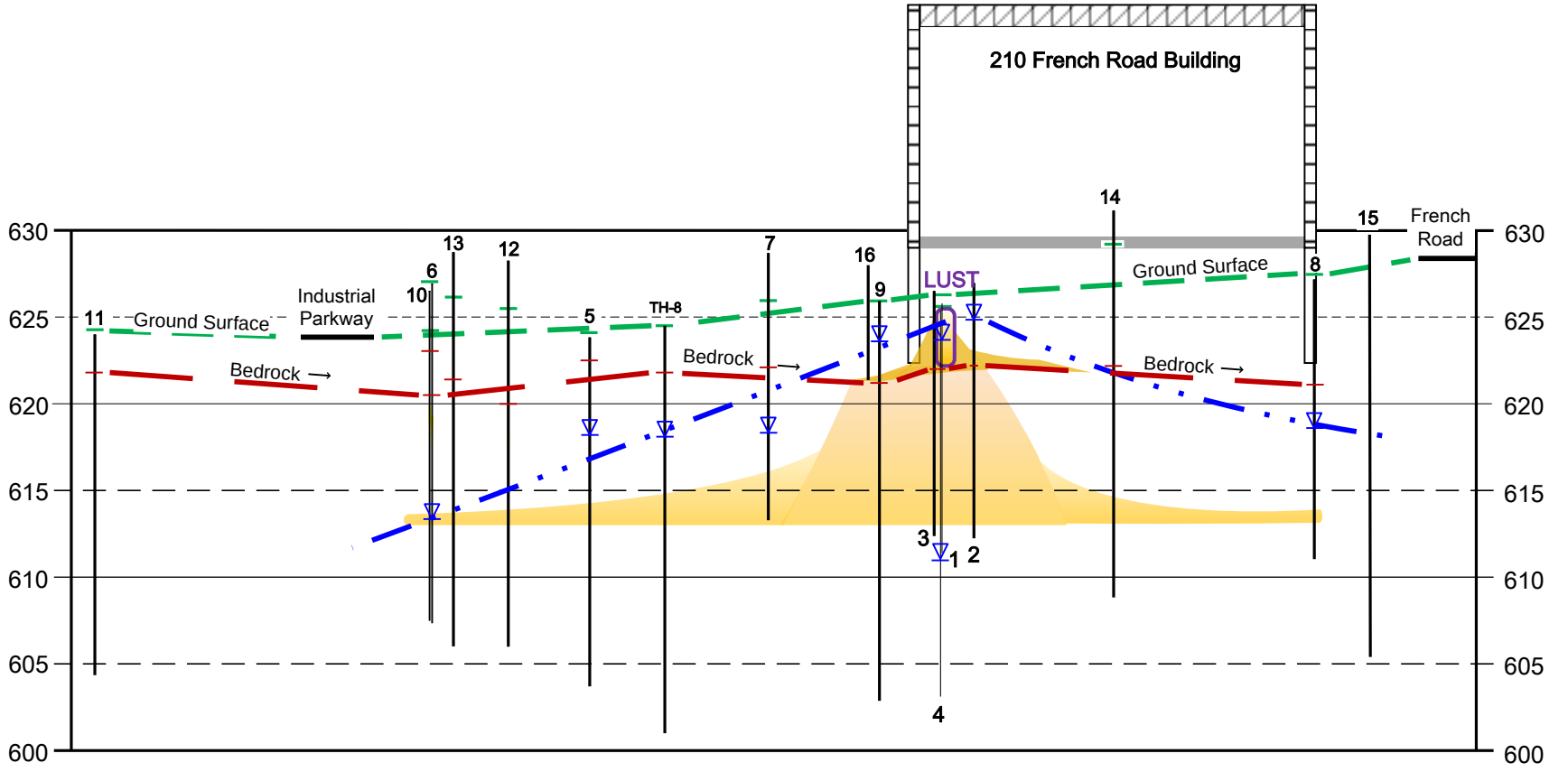
Ken W. Kloeber Consulting Engineers

CMS Property Associates Remediation Site
Periodic Review Report

Figure 3

Area Land Uses

Ken W. Kloeber Consulting Engineers



Key:

Groundwater Monitoring Wells

5 — *Well No.*

Ground Surface

Ground Water Elevation

Bedrock Surface

Existing Site Grade

Top of Bedrock

Assumed Piezometric Surface after LUST removed (Aug 1997)

0 60 100 Feet 200

Approximate Horizontal Scale

N

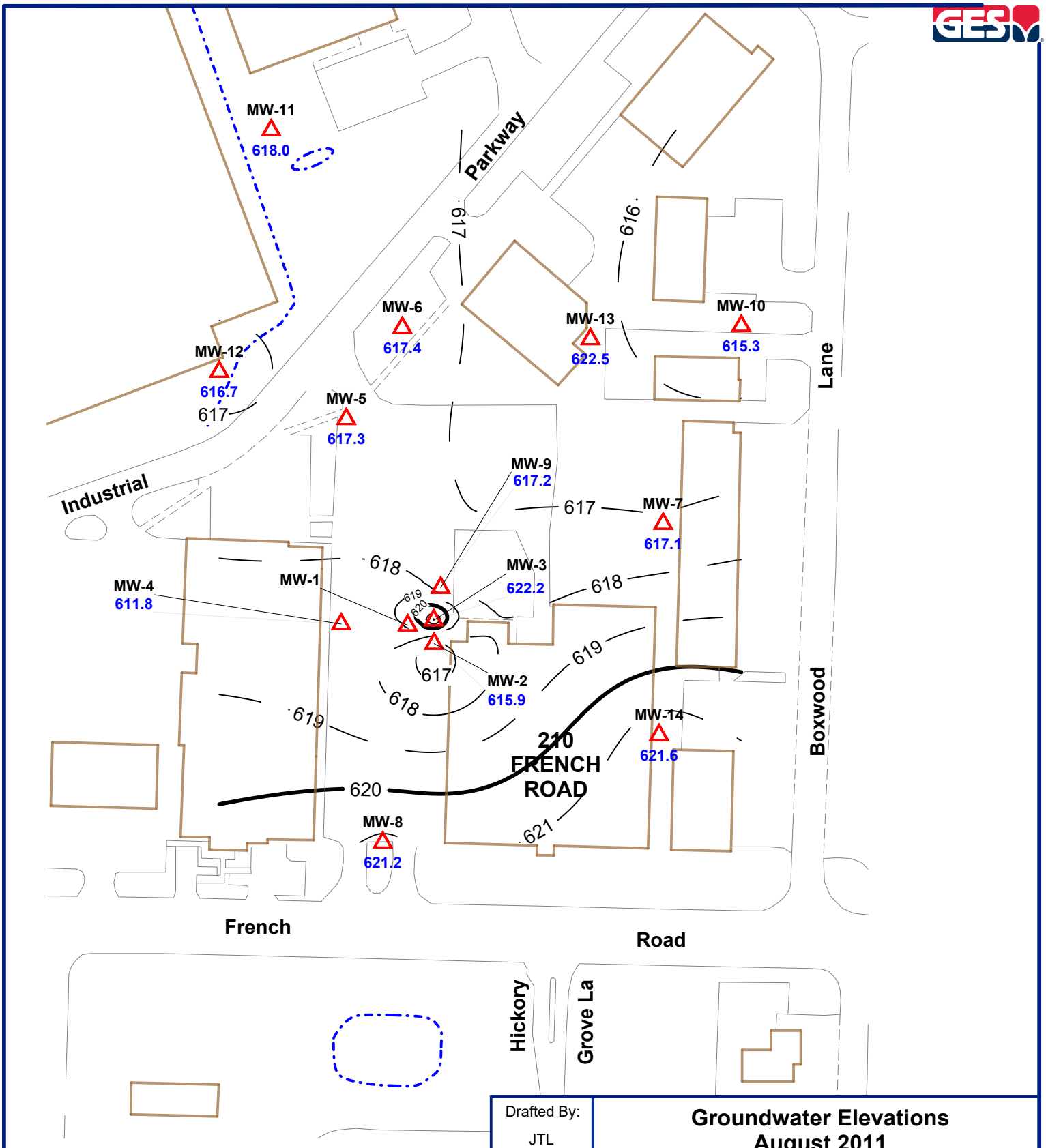
Note: Site cross-section is an approximate north-south line through well MW-1. Elevations are NAVD88.

CMS Property Associates Remediation Site
Periodic Review Report

Figure 4

Conceptual Site Model

Ken W. Kloeber Consulting Engineers



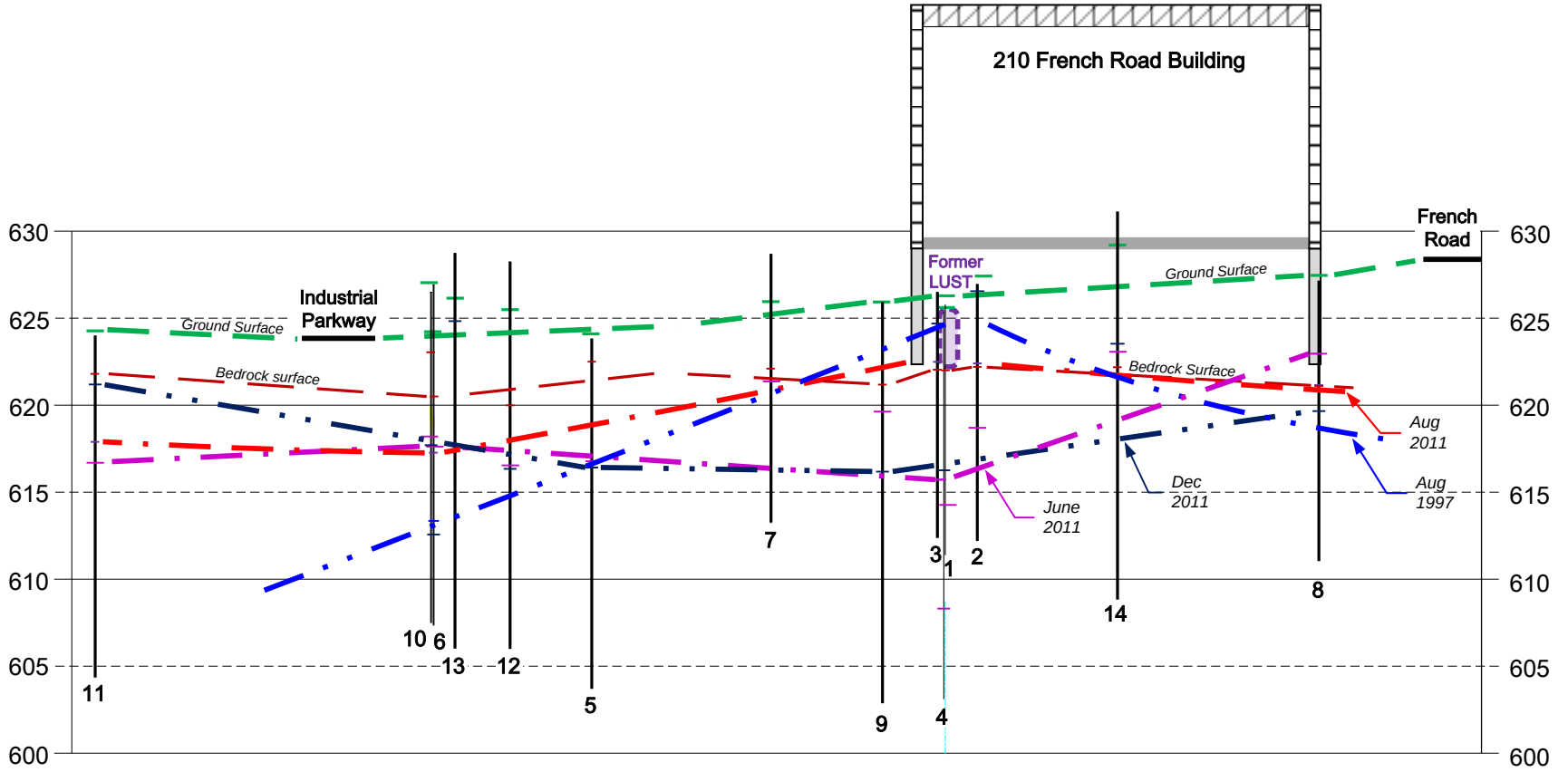
Notes:
- MW-4 and MW-13 were discounted
- The piezometric head in the extraction wells is artificially depressed by the GWE/TS

Legend:

Main Drainage Swale

Storm Water detention Basin

Drafted By: JTL	**Groundwater Elevations August 2011**
Checked By: DMC	CMS Associates Remediation Site 210 French Road Cheektowaga, New York
Date: 10-26-2017	**Groundwater & Environmental Services, Inc.** 708 North Main, Suite 201, Blacksburg, VA 24060
North	Map Scale (ft) 0 100 200
	Figure 5



Key:

Groundwater Monitoring Wells

Ground Surface

Water Elevation

Bedrock Surface

MW No.

5

Existing Site Grade

Top of Bedrock

Assumed Piezometric Surface Between Wells

0 60 100 Feet 200

Approximate Horizontal Scale

N

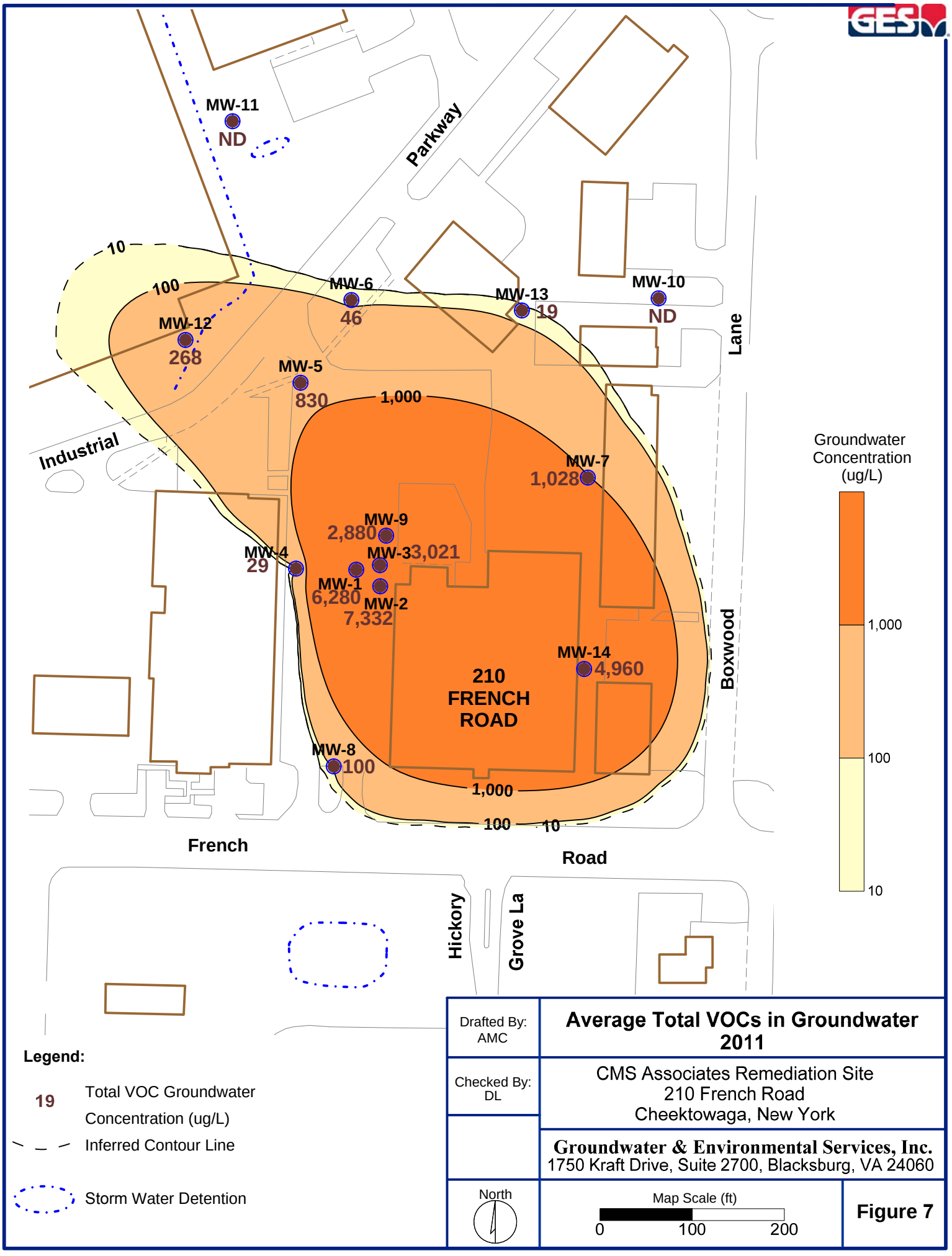
CMS Property Associates Remediation Site
Periodic Review Report

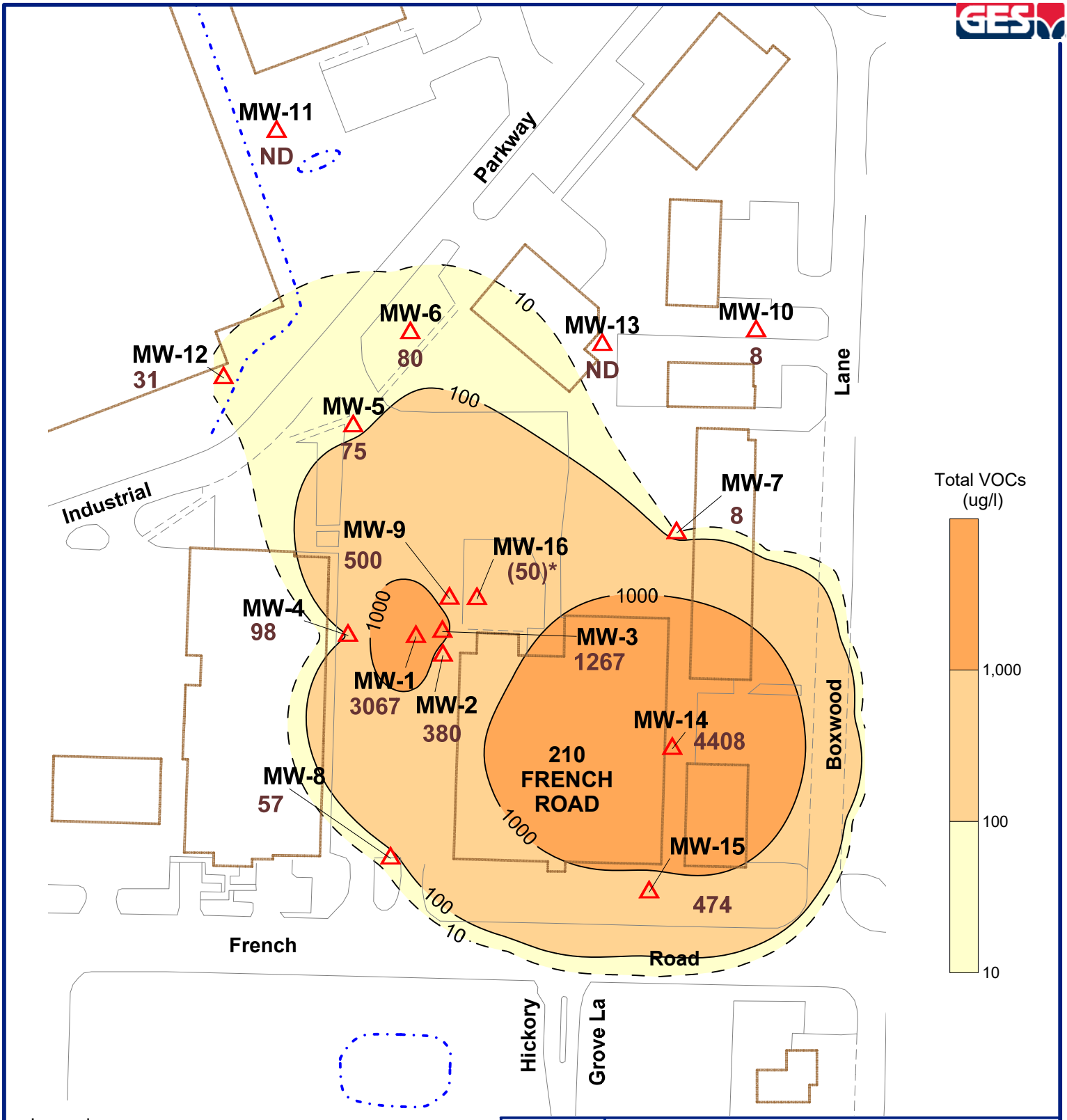
Figure 6

Confined Groundwater Piezometric Surface

Ken W. Kloeber Consulting Engineers

Note: Site cross-section is an approximate north-south line through well MW-1. Elevations are NAVD88. Assumed piezometric surface is from well elevations and is generalized between wells.


MW-11
ND
Parkway
10
100
MW-6
46
MW-13
19
MW-10
ND
MW-12
268
Lane
MW-5
830
1,000
Industrial
MW-7
1,028
MW-9
2,880
MW-4
29
MW-3
3,021
MW-1
6,280
MW-2
7,332
MW-14
4,960
210
FRENCH
ROAD
Boxwood
MW-8
100
1,000
100
10
French
Road
Hickory
Grove La
Groundwater
Concentration
(ug/L)
1,000
100
10
Legend:
19
Total VOC Groundwater
Concentration (ug/L)
Inferred Contour Line
Storm Water Detention
Drafted By:
AMC
Average Total VOCs in Groundwater
2011
Checked By:
DL
CMS Associates Remediation Site
210 French Road
Cheektowaga, New York
Groundwater & Environmental Services, Inc.
1750 Kraft Drive, Suite 2700, Blacksburg, VA 24060
North
Map Scale (ft)
0
100
200
Figure 7



Legend:

* Shallow Ooverburden Well

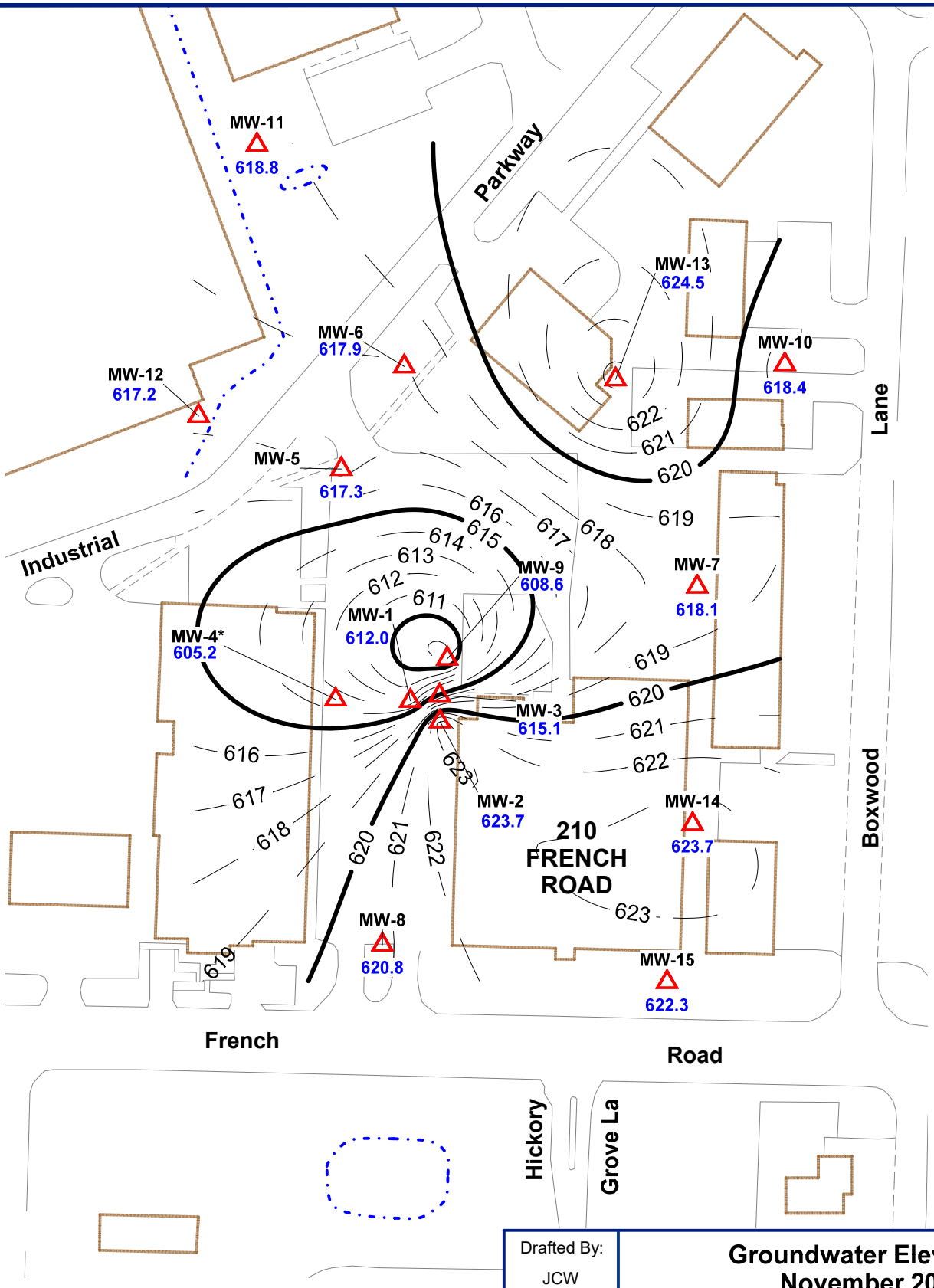
19 Total Groundwater VOCs (ug/L)

Inferred Contour Line

Main Drainage Swale

Storm Water Detention

Drafted By: JCW	**Total Groundwater VOCs December 2018**
Checked By: DMC	CMS Associates Remediation Site 210 French Road Cheektowaga, New York
Date: 6-25-2019	**Groundwater & Environmental Services, Inc.** 708 North Main, Suite 201, Blacksburg, VA 24060
North	Map Scale (ft) 0 100 200
	Figure 8



Notes:
* Average groundwater elevation at MW-4 was not used in contours.

Legend:

Main Drainage Swale

Storm Water Detention

Drafted By: JCW	**Groundwater Elevations November 2018**
Checked By: DMC	CMS Associates Remediation Site 210 French Road Cheektowaga, New York
Date: 6-25-2019	**Groundwater & Environmental Services, Inc.** 708 North Main, Suite 201, Blacksburg, VA 24060
North	Map Scale (ft) 0 100 200
	Figure 9

APPENDIX A

Tabular Summary of Groundwater Quality Monitoring – through Dec 2018

Summary of Summary of Total VOC Concentrations (µg/l)

After Removing Source (Leaking UST)

MW		-1	-2	-3	-9	-4	-5	-6	-7	-8
Date		Extraction Wells				Perimeter Wells				
Leaking UST removed March 5, 1996										
		Wells Installed 5/3/96								
5/15/1996		27,440	94,560	19,130		Wells Installed May 1996				
5/29/196	Phase I	--	--	--		20,970	12,990	--		
5/31/1996		--	--	--		--	--	86	Wells Installed 9/26/96	
6/5/1996		--	--	--		138	4,028	--		
6/15/1996		42,180	130,070	49,387		443	3,727	147	--	--
10/9/1996	Phase II	--	130,600	55,700	Well Installed 7/18/97	620	5,230	277	1,500	249
10/30/1996		--	153,300	--		--	--	--	--	--
3/20/1997		--	117,861	29,134		600	5,800	100	2,000	72
1/7/1998	Phase III	--	6,830	--	--	--	--	--	--	--
2/11/1998		--	457	--	--	--	6,700	111	2,000	--

Summary of Summary of Total VOC Concentrations (µg/l)

After Installing Groundwater Extraction / Treatment System

MW		-1	-2	-3	-9	-4	-5	-6	-7	-8	-10	-11
Date		Extraction Wells				Perimeter Wells					Off-Site Wells	
Post Recovery & Treatment Sampling (operational 6/4/98):												
8/12/1998		--	3,740	--	--	--	4,080	--	751	--	Wells Installed 11/23-24/98	
10/12/1988		27,400	30,100	10,600	29,800	--	--	--	--	--		
1/13/1999	Phase	--	--	--	--	--	--	--	--	--	nd	nd
2/10/1999	III	5,240	8,920	14,300	--	--	--	--	--	--	--	--
5/28/1999		8,500	12,270	10,600	3,210	--	--	--	--	--	--	--
6/25/1999	Phase	--	33,000	--	--	16	5,040	102	1,100	282	nd	nd
10/22/1999	IV	40,990	28,400	28,400	10,490	--	--	--	--	--	--	--
Extraction System shut down 12/1/1999 when fire destroyed system -- replaced and back on line 4/6/2000												
NYSDEC *Record of Decision* March 2003												
6/13/2000		6,530	379	29,400	5,220	--	--	--	--	--	--	--
11/1/2001		2,027	2,152	7,114	8,015	226	2,631	23	2,092	74	nd	nd
9/25/2002		2,442	3,943	5,621	9,813	--	2,462	23	241	138	nd	nd
6/29/2003		--	--	--	--	--	3,177	20	870	--	nd	nd
6/30/2003		2,174	5,081	17,918	12,984	--	--	--	--	--	--	--
8/9/2003		6,372	375	5,890	3,926	31	1,740	31	676	140	nd	nd
11/7/2003		3,830	8,900	18,500	8,700	14	3,434	--	1,400	115	--	--
3/31/2004		6,920	4,280	14,600	1,626	22	1,490	--	804	63	--	--
5/28/2004	Phase	9,280	1,624	8,630	1,715	37	3,220	69	610	112	nd	nd
9/26/2004	IV	13,030	9,940	34,100	6,580	--	--	--	--	--	--	--
9/28/2004		--	--	--	--	23	3,400	69	782	(1)	--	--
5/22/2005		9,540	5,060	13,250	3,980	8	2,810	50	850	86	nd	nd
1/31/2006		469	4,860	9,800	1,092	0	2,950	33	984	22	nd	nd
6/9/2006		9,940	2,836	10,600	5,040	89	1,700	27	680	95	nd	nd
9/29/2006		5,500	3,681	4,810	6,060	0	1,770	30	1,078	57	nd	nd
12/17/2006		11,590	4,920	4,240	2,200	1	3,010	21	1,420	68	--	--
3/27/2007		3,390	2,913	8,580	2,156	4	1,443	28	596	50	--	--
3/17/2008		--	--	--	--	57	2,530	25	1,300	47	--	--
3/18/2008		6,650	4,630	6,700	2,278	--	--	--	--	--	--	--
10/2/2008		--	--	--	--	590	3,290	26	910	62	nd	nd
10/7/2008		5,970	6,020	8,850	7,600	--	--	--	--	--	--	--

Note:

(1) Appeared to be sampling and/or lab result error, and 9/28/04 results were subsequently discarded

Summary of Summary of Total VOC Concentrations (µg/l)

After Rebuilding Groundwater Extraction Wells

MW	-1	-2	-3	-9	-4	-5	-6	-7	-8	-14	-10	-11	-12	-13
Date	Extraction Wells				Perimeter Wells						Off-site Wells			
MW-5 connected to suction manifold; MW-3 suction closed in October 2008														
4/10/2009	7,070	8,940	4,600	5,580	4	1,370	42	1,500	60		nd	nd		
9/4/2009	2,910	4,780	3,960	5,590	52	780	26	540	68		--	--		
Extraction system shut down October 2009 for well rebuilding and manifold repairs														
2/25/2010	7,040	13,970	1,268	670	44	880	21	1,200	--		--	--		
3/24/2010	--	--	--	--	--	--	--	--	64		--	--		
MW-1, -2, -3, -9 Rebuilt / fully operating in April 2010														
4/13/2010	8,940	16,790	2,170	1,437	49	1,200	39	1,300	49		nd	nd	Installed 10/21-25/10	
10/29/2010	5,070	2,108	1,970	1,480	43	1,780	70	580	169		--	--		
11/20/2010	--	--	--	--	--	--	--	--	--	Installed 4/7/11	--	--	136	5
2/3/2011	--	19,560	8,610	2,910	14	--	34	740	--		--	--	126	5
4/15/2011	4,990	920	5,130	238	8	136	39	1,700	35	5,380	nd	nd	312	5
6/8/2011	--	--	--	--	--	556	--	--	--	4,500	--	--	560	3
7/21/2011	--	--	--	--	--	950	--	--	--	3,460	--	--	197	16
10/18/2011	6,118	4,615	46	8,335	33	355	47	--	146	6,498	1	nd	277	86
12/12/2011	--	--	193	--	--	--	--	820	--	--	--	--	--	--
1/31/2012	43	2,886	1,753	1,135	8	537	46	125	81	8,308	< 1	--	338	< 1
3/22/2012	2,927	5,096	5,088	1,136	33	1,196	45	125	67	7,922	< 1	1	358	10
6/30/2012	3,262	3,742	2,577	1,495	3	1,573	55	1,291	134	7,794	< 1	< 1	239	4
10/2/2012	111	1,758	133	284	12	1,458	52	587	175	12,548	< 1	< 1	247	6
12/18/2012	4,245	865	214	1,860	20	2,202	14	292	359	4,955	< 1	2	325	< 1
4/5/2013	556	3,032	922	1,213	27	2,154	193	846	66	5,308	< 1	--	215	4
7/24/2014	nd	186	455	2,203	54	1,265	76	571	130	61	< 1	1	64	< 1
12/4/2014	2,746	377	233	871	21	1,537	55	196	93	8,006	< 1	< 1	226	< 1

Summary of Summary of Total VOC Concentrations (µg/l)

After Rebuilding Groundwater Extraction Wells

MW	-1	-2	-3	-9	-4	-5	-6	-7	-8	-14	-15	-10	-11	-12	-13
Date	Extraction Wells				Perimeter Wells							Off-site Wells			
MW-5 connected to suction manifold; MW-3 suction closed in October 2008															
4/10/2009	7,070	8,940	4,600	5,580	4	1,370	42	1,500	60			nd	nd		
9/4/2009	2,910	4,780	3,960	5,590	52	780	26	540	68			--	--		
Extraction system shut down October 2009 for well rebuilding and manifold repairs															
2/25/1010	7,040	13,970	1,268	670	44	880	21	1,200	--			--	--		
3/24/2010	--	--	--	--	--	--	--	--	64			--	--		
MW-1, -2, -3, -9 Rebuilt / fully operating in April 2010															
4/13/2010	8,940	16,790	2,170	1,437	49	1,200	39	1,300	49			nd	nd	Installed 10/21-25/10	
10/29/2010	5,070	2,108	1,970	1,480	43	1,780	70	580	169			--	--		
11/20/2010	--	--	--	--	--	--	--	--	--	Installed 4/7/11		--	--	136	5
2/3/2011	--	19,560	8,610	2,910	14	--	34	740	--			--	--	126	5
4/15/2011	4,990	920	5,130	238	8	136	39	1,700	35	5,380		nd	nd	312	5
6/8/2011	--	--	--	--	--	556	--	--	--	4,500		--	--	560	3
7/21/2011	--	--	--	--	--	950	--	--	--	3,460		--	--	197	16
10/18/2011	6,118	4,615	46	8,335	33	355	47	--	146	6,498		1	nd	277	86
12/12/2011	--	--	193	--	--	--	--	820	--	--		--	--	--	--
1/31/2012	43	2,886	1,753	1,135	8	537	46	125	81	8,308		< 1	--	338	< 1
3/22/2012	2,927	5,096	5,088	1,136	33	1,196	45	125	67	7,922		< 1	1	358	10
6/30/2012	3,262	3,742	2,577	1,495	3	1,573	55	1,291	134	7,794		< 1	< 1	239	4
10/2/2012	111	1,758	133	284	12	1,458	52	587	175	12,548		< 1	< 1	247	6
12/18/2012	4,245	865	214	1,860	20	2,202	14	292	359	4,955		< 1	2	325	< 1
4/5/2013	543	3,032	922	1,213	27	2,154	193	846	66	5,308		< 1	--	215	4
7/24/2014	nd	186	455	2,203	54	1,265	76	571	127	61		< 1	1	64	< 1
12/4/2014	2,746	377	233	858	21	1,537	55	196	92	8,006		< 1	< 1	224	< 1
6//7/2015	2,988	--	756	432	26	73	115	173	109	7,710	Installed 10/19/15	nd	nd	151	< 1

Summary of Summary of Total VOC Concentrations (µg/l)

After Rebuilding Groundwater Extraction Wells

MW	-1	-2	-3	-9	-4	-5	-6	-7	-8	-14	-15	-10	-11	-12	-13	-16
Date	Extraction Wells				Perimeter Wells							Off-site Wells				Shallow Overburden Well
MW-5 out of service / Additional wells MW-15, MW-16 installed																
											Installed 10/19/15					Installed 10/19/15
12/17/2015	5,146	1,415	289	195	13	Out of service	104	133	145	4,704	--	nd	< 1	183	< 1	dry
5/2/2016	3,226	1,031	2.738	720	28		129	57	26	8,969	838	nd	nd	119	< 1	64
7/21/2016	5,615	863	1,408	992	24		85	410	93	3,710	664	10	nd	158	nd	dry
12/21/2016	45	nd	177	156	21		82	13	--	3,775	984	nd	nd	29	nd	52
4/21/2017	2,587	792	169	554	7		81	79	75	2,798	763	nd	nd	165	nd	36
6/16/2017	5,577	721	682	1,068	69		52	157	61	4,902	770	nd	nd	189	7	48
11/2/2017	4,055	518	644	1,127	nd		103	107	42	5,142	538	nd	nd	55	nd	35
4/24/2018	1,733	570	1,051	144	14		61	2	31	8,917	487	nd	nd	192	nd	40
7/3/2018	3,031	573	436	724	175	Re-established Nov 2018	60	23	67	6,169	440	nd	nd	69	nd	43
10/3/2018	2.669	364	505	809	157		98	633	83	6,660	473	nd	nd	106	nd	99
12/28/2018	3,067	980	1,227	500	98	975	80	8	45	4,408	474	nd	nd	31	nd	50

CMS REMEDIATION SITE MW-1	pre IRM <=		=> post IRM				system down 12/12/99 - 4/6/00										
Volatile Organic Compound	5/15/96	6/15/96	10/12/98	2/10/99	5/28/99	10/22/99	6/13/00	11/1/01	9/25/02	6/30/03	8/9/03	11/7/03	3/31/04	5/28/04	9/26/04	5/22/05	1/31/06
Detection limit	100																10
1,1,1-Trichloroethane	9400	18000	14000	1400		16000	2200	509	564	688	2350	1000	1900	3200	2200	2300	
1,1,2,2-Tetrachloroethane		640	1														
1,1,2-Trichloro-1,2,2-trifluoroethane																	
1,1,2-Trichloroethane							240										
1,1-Dichloroethane	9800	17000	4900	1800	5200	9000	1600	665	908	569	1750	1400	2600	3300	6000	4500	
1,1-Dichloroethene	560						100		35.1				110				
1,2,4-Trichlorobenzene																	
1,2,4-Trimethylbenzene													310	280		250	40
1,2-Dichloroethane	100						180										
1,3,5-Trimethylbenzene																	27
1,4-Dichlorobenzene	540		1														
2-Butanone																	
4-Isopropyltoluene																	
Acetone																	
Benzene																	39
Bromomethane										85.9							
Carbon disulfide																	
Chloroethane															270		
Chloroform		630													960		
cis-1,2-Dichloroethene	1900	2900	4100	1100		15000	1600	853	734	720	1820	1100	1600	2000	2300	1900	
Cyclohexane																	
Ethylbenzene																	21
Hexachlorobutadiene																	
Methylene chloride																	16LC
Naphthalene																	16
n-Propylbenzene																	
Tetrachloroethene	3700	2900		100	3300												
Toluene		29															110
trans-1,2-Dichloroethene																	
Trichloroethene	1200		4400	840		990	610		37.1				200	220			
Vinyl chloride									164	111	452	330	200	280	1300	590	
m,p-Xylene	100																150
o-Xylene	140																50
Total Xylenes		81															
Total VOCs, µg/l	**27440**	**42180**	**27402**	**5240**	**8500**	**40990**	**6530**	**2027**	**2442.2**	**2173.9**	**6372**	**3830**	**6920**	**9280**	**13030**	**9540**	**453**

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-1	<= post IRM =>									=> post extraction well rebuild							
Volatile Organic Compound	6/9/06	9/29/06	12/17/06	3/27/07	3/18/08	10/7/08	4/10/09	9/4/09	2/25/10	4/13/10	10/29/10	4/16/11	10/18/11	1/31/12	3/22/12	6/30/12	10/2/12
Detection limit												100	125-2500	0.5 - 10	12 - 500	25 - 500	1 - 20
1,1,1-Trichloroethane	2600	1800	4600	1100	2200	2300	2700	1100	3100	2000	1000	970	855	14.9	606	1070	2.1
1,1,2,2-Tetrachloroethane																	
1,1,2-Trichloro-1,2,2-trifluoroethane														0.14	10	6	
1,1,2-Trichloroethane																	
1,1-Dichloroethane	4800	2300	2100	1400	2300	1700	2000	1100	2600	4600	2700	2500	3790	16.4	1480	1450	8.4
1,1-Dichloroethene														0.32	39.8	13.5	
1,2,4-Trichlorobenzene																	
1,2,4-Trimethylbenzene				110		410						70	112	0.48	69.2	49	1.78
1,2-Dichloroethane																	
1,3,5-Trimethylbenzene												50		0.11	17.8	10.5	0.44
1,4-Dichlorobenzene																	
2-Butanone																	80
4-Isopropyltoluene															8.5		
Acetone														3.75LC		176LC	10LC
Benzene																	
Bromomethane																	
Carbon disulfide														0.11		56	
Chloroethane												60	290		38.2	27	6.42
Chloroform												20					
cis-1,2-Dichloroethene	1900	780	3800	580	1800	740	1400	380	930	1600	660	1000	473	5.54	411	326	0.68
Cyclohexane															7.25		
Ethylbenzene															2.75		
Hexachlorobutadiene																	
Methylene chloride			210LC				530LC			210LC					11.5LC	40.5LC	0.82LC
Naphthalene																	
n-Propylbenzene																	
Tetrachloroethene																	
Toluene			210												9		0.22
trans-1,2-Dichloroethene															2.5	5.5	
Trichloroethene			240									40	42.5	1.47	36.5	12	
Vinyl chloride	640	620	430	200	350	820	440	330	510	530	710	280	555	3.99	156	236	0.86
m,p-Xylene															13.2		
o-Xylene															19		
Total Xylenes																	
Total VOCs, µg/l	**9940**	**5500**	**11380**	**3390**	**6650**	**5970**	**6540**	**2910**	**7140**	**8730**	**5070**	**4990**	**6117.5** w/ Js	**43.46** w/ Js	**2926.7** w/ Js	**3261.5** w/ Js	**100.9** w/ Js
italic = found in tank contents																	
underlined = found in soil																	

CMS REMEDIATION SITE MW-1	<= post extraction well rebuild =>															
Volatile Organic Compound	12/18/12	4/5/13	7/24/14	12/4/14	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	25 - 50	5 - 100	1 - 2	10 - 20	23 - 500	.50 - 10	25 - 500	40 - 400	2 - 20	20 - 200	20 - 200	20 - 200	40 - 200	20 - 100	20 - 200	20 - 100
1,1,1-Trichloroethane	970	106		918	868	1270	762	1850	1.94	519	1540	959	340	636	500	498
1,1,2,2-Tetrachloroethane																
1,1,2-Trichloro-1,2,2-trifluoroethane	5	2		3			8									
1,1,2-Trichloroethane																
1,1-Dichloroethane	2290	311		1330	1420	2750	1710	2960	28	1470	3040	2390	1010	1860	1760	1940
1,1-Dichloroethene	29	2		11	27.5	8	22			16.7						10.2
1,2,4-Trichlorobenzene					110	67.5	107									
1,2,4-Trimethylbenzene	43.5	5.7				31.5		57.9		44.4	74.4	70.8	55.0	90.5	29.9	47.1
1,2-Dichloroethane																
1,3,5-Trimethylbenzene	11	1.9			18		17							11.5		
1,4-Dichlorobenzene																
2-Butanone		14.7														
4-Isopropyltoluene					8											
Acetone		12.8LC			64.5LC											
Benzene																
Bromomethane																
Carbon disulfide																
Chloroethane	49.5	9.7		14.4	39	93.5	57.5	102		78.4	179	252	79.6	105	149	152
Chloroform																
cis-1,2-Dichloroethene	482	38.9		294	277	123	264	135	9.54	212	156		118	87.4		96.1
Cyclohexane		1.1			6.5	18										
Ethylbenzene																
Hexachlorobutadiene						5.5										
Methylene chloride	21LC	2.9LC			69.0LC	10LC										
Naphthalene						89.5										
n-Propylbenzene					9	10	8.5									
Tetrachloroethene				4.2												
Toluene	5	1.2		2.4		7										
trans-1,2-Dichloroethene				2.0		5	5.5									
Trichloroethene	37	3.2		23	19	14	33		4.92	23.2	21.6			13.8		19.4
Vinyl chloride	318	44.7		144	186	434	224	510	1.04	223	566	383	130	227	230	304
m,p-Xylene																
o-Xylene	5	1.2				23	7									
Total Xylenes																
Total VOCs, µg/l	**4245** w/ Js	**543.3** w/ Js	**nd** w/ Js	**2746** w/ Js	**2988** w/ Js	**5145.5** w/ Js	**3225.5** w/ Js	**5614.9** w/ Js	**45.44** w/ Js	**2586.7** w/ Js	**5577** w/ Js	**4054.8** w/ Js	**1732.6** w/ Js	**3031.2** w/ Js	**2668.9** w/ Js	**3066.8** w/ Js
italic = found in tank contents																
underlined = found in soil																

CMS REMEDIATION SITE MW-2	pre IRM <=							=> post IRM							system down 12/12/99 to 4/6/00				
Volatile Organic Compound	5/15/96	6/15/96	10/9/96	10/30/96	3/20/97	1/7/98	2/11/98	8/12/98	10/12/98	2/10/99	5/28/99	6/25/99	10/22/99	6/13/00	11/1/01	9/25/02	6/30/03	8/9/03	11/7/03
Detection limit	500			3-10,000	5000														
1,1,1-Trichloroethane	45000	84000	82000	81000	84000	2700	230	1500	12000	1600	6200	21000	9400	320	625	1040	1460	143	3300
1,1,2,2-Tetrachloroethane		1700																	
1,1,2-Trichloro-1,2,2-trifluoroethane																			
1,1,2-Trichloroethane																			
1,1-Dichloroethane	32000	26000	31000	30000	19000	2700	130	650	4400	4800	2400	5200	4500		616	854	1280	85	2600
1,1-Dichloroethene	1200																		
1,2,3-Trichloropropane																			
1,2,4-Trimethylbenzene																			
1,2-Dichloroethane	650																		
1,3,5-Trimethylbenzene																			
1,3-Dichloro-2-propanol																			
1,4-Dichlorobenzene	610																		
1,4-dioxane																			
2-Butanone																			
Acetone																			
Allyl chloride																			
Benzene																			
Bromomethane																		17.9	
Carbon tetrachloride				24000															
Chloroethane																			
Chloroform		1200																	
Chloromethane																			
cis-1,2-Dichloroethene	1800	1900	3600	4300		670	33	200	1700	620	870	1900	9800		865	1930	2250	112	3000
Cyclohexane																			
Ethylbenzene		80			81														
Isopropylbenzene																			
Methylcyclohexane																			
Methylene chloride																			
Naphthalene																			
n-Propylbenzene																			
sec-Butylbenzene																			
Tetrachloroethene	12000	11000	14000	14000	14000		17	190						59					
Toluene		290			230														
trans-1,2-Dichloroethene																			
trans-1,3-dichloropropene																			
Trichloroethene	1300	3300				760	47	1200	12000	1900	2800	4900	4700		46.4	119			
Vinyl chloride																	91.4	17.4	
m,p-Xylene																			
m-Xylene																			
o-Xylene																			
Total Xylenes		600			550														
Total VOCs, µg/l	**94560**	**130070**	**130600**	**153300**	**117861**	**6830**	**457**	**3740**	**30100**	**8920**	**12270**	**33000**	**28400**	**379**	**2152.4**	**3943**	**5081.4**	**375.3** w/ Js	**8900**
						sample re-run with lower limits													
italic = found in tank contents																			
underlined = found in soil																			

CMS REMEDIATION SITE MW-2	<= post IRM =>							<= post IRM =>							post extraction well rebuild =>				
Volatile Organic Compound	3/31/04	5/28/04	9/26/04	5/22/05	1/31/06	6/9/06	9/29/06	12/17/06	3/27/07	3/18/08	10/7/08	4/10/09	9/4/09	2/25/10	4/13/10	10/29/10	2/3/11	4/16/11	10/18/11
Detection limit																	500	100	25-499
1,1,1-Trichloroethane	1200	560	3200	1300	1400	1000	1000	1800	770	1800	1700	3800	1600	5600	7600	610	5900	190	1010
1,1,2,2-Tetrachloroethane																			
1,1,2-Trichloro-1,2,2-trifluoroethane																			26.5
1,1,2-Trichloroethane																			
1,1-Dichloroethane	1100	400	2900	1300	2000	990	1100	1400	710	1200	1700	2200	1300	4100	5300	680	7400	260	1490
1,1-Dichloroethene																			35.5
1,2,3-Trichloropropane																			
1,2,4-Trimethylbenzene				110					60		420					68			109
1,2-Dichloroethane															560				20.5
1,3,5-Trimethylbenzene																			18.5
1,3-Dichloro-2-propanol																			
1,4-Dichlorobenzene																			
1,4-dioxane																			
2-Butanone																			
Acetone																			
Allyl chloride																			
Benzene																			
Bromomethane																			
Carbon tetrachloride																			
Chloroethane									71									20	53.5
Chloroform			230															20	
Chloromethane																			
cis-1,2-Dichloroethene	1600	610	2700	2200	1000	760	1100	1500	1100	1500	1500	2600	1500	3900	2000	570	5600	410	1390
Cyclohexane																			
Ethylbenzene																			5.5
Isopropylbenzene																			
Methylcyclohexane																			
Methylene chloride			400		170							340			600				
Naphthalene																			
n-Propylbenzene																			9.5
sec-Butylbenzene																			
Tetrachloroethene																			5.5
Toluene																			11
trans-1,2-Dichloroethene																			11
trans-1,3-dichloropropene																			
Trichloroethene	380	54					81		52										39
Vinyl chloride			510	150	290	86	400	220	150	130	700				730	180	660	20	366
m,p-Xylene																			
m-Xylene																			
o-Xylene																			14
Total Xylenes													380	370					
Total VOCs, µg/l	**4280**	**1624**	**9940**	**5060**	**4860**	**2836**	**3681**	**4920**	**2913**	**4630**	**6020**	**8940**	**4780**	**13970**	**16790**	**2108**	**19560**	**920**	**4615** w/ Js

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-2	<= post extraction well rebuild =>																			
Volatile Organic Compound	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13	7/24/14	12/4/14	12/4/14	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit		25 - 200	25 - 500	25 - 500	10 - 40	25 - 50	2.50 - 50	1 - 20	1 - 20	10 - 200	10 - 200	20 - 100	2 - 10	10 - 50	10 - 100	20 - 100	10 - 50	5 - 25	2 - 10	10 - 100
1,1,1-Trichloroethane	698	1730	1080	128	162	784	49.9	67.2	67.2	111	64.8	32.4								29.1
1,1,2,2-Tetrachloroethane								0.64	0.64	2.9										
1,1,2-Trichloro-1,2,2-trifluoroethane	13	36	21.5	7		9	8.2				3.8									
1,1,2-Trichloroethane										1.76										
1,1-Dichloroethane	1130	1570	1400	1180	363	1170	26.2	127	127	1110	774	709		605	557	477	382	356	173	589
1,1-Dichloroethene	14.5	68.5	27.5		3.6	18	1	0.9	0.9											
1,2,3-Trichloropropane																				
1,2,4-Trimethylbenzene	25.5	89	92	40	5.8	33.5	4.65	36.8	36.8	21.7	10.8			12.4						7.15
1,2-Dichloroethane			8.5		4.4			3.54	3.54	5.58	3.4								1.24	7.82
1,3,5-Trimethylbenzene	5.5	27	16.5	7		6.5		5.52	5.52		2.6									
1,3-Dichloro-2-propanol																				
1,4-Dichlorobenzene																				
1,4-dioxane																		54.6	49.0	
2-Butanone			59	129			24.4	3.42	3.42	13.8										
Acetone			154				28	4.46	4.46		46.8L									
Allyl chloride																				
Benzene										0.28				8.73	4.45		3.49	2.6	1.47	4.77
Bromomethane																				
Carbon tetrachloride										15.7										
Chloroethane	36.5	69	122	17.5		32	3.65	3.36	3.36		162	122		148	160	41.1	184	157	133	235
Chloroform																				
Chloromethane										92.1										
cis-1,2-Dichloroethene	508	1130	332	26.5	294	783	7.2	73.4	73.4	1.56									1.49	40.9
Cyclohexane										0.92										
Ethylbenzene		5						1.44	1.44	1.06										
Isopropylbenzene								1.02	1.02											
Methylcyclohexane																		2.97	1.86	5.02
Methylene chloride		22	41.5L	25L	8.2L	14L		0.98L	0.98L	.54L										
Naphthalene								2.04	2.04	3.66										
n-Propylbenzene							0.7	3.7	3.7	2.04										
sec-Butylbenzene							0.85	2.2	2.2											
Tetrachloroethene								0.46	0.46	0.3										
Toluene	6	19.5	12.5			9.5	0.5	1.18	1.18	2.2	2.4			18.1						8.39
trans-1,2-Dichloroethene		6	6	5				0.6	0.6	4.36	4								1.67	
trans-1,3-dichloropropene																				
Trichloroethene	14	62	9.5		8	14	1.9	5.74	5.74	0.24										
Vinyl chloride	435	202	366	218	24.4	167	27.1	21.3	21.3	5.22									1.66	52.5
m,p-Xylene		23.5	24					3.94	3.94	1.28										
m-Xylene																				
o-Xylene		36	10.5			5.5	0.55	5.96	5.96	5.26	3.4									
Total Xylenes										6.54			nd							
Total VOCs, µg/l	**2886**	**5095.5**	**3741.5**	**1758**	**865.2**	**3032**	**186.2**	**376.12**	**376.12**	**1414.98**	**1031.2**	**863.4**	**nd**	**792.23**	**721.45**	**518.1**	**569.49**	**573.17**	**364.39**	**979.65**
	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js
italic = found in tank contents																				
underlined = found in soil																				

CMS REMEDIATION SITE MW-3	pre IRM <=				=> post IRM			system down 12/12/99 - 4/6/00						<= post IRM =>						
Volatile Organic Compound	5/16/96	6/15/96	10/9/96	3/20/97	10/12/98	2/10/99	2/11/99	10/22/99	6/13/00	11/1/01	9/25/02	6/30/03	8/9/03	11/7/03	4/1/04	5/28/04	9/26/04	5/22/05	1/31/06	6/9/06
Detection limit																				
1,1,1-Trichloroethane	7,300	22000	23000	16000	4200	8000		11000	16000	1720	1710	7470	2250	5800	6700	4000	15000	6300	4400	3500
1,1,2-Trichloro-1,2,2-trifluoroethane																				
1,1-Dichloroethane	8200	22000	26000	10000	2800	2700	5400	6200	5200	1700	1190	3110	1010	5800	1800	1200	6500	2100	1600	3600
1,1-Dichloroethene	310																			
1,2,4-Trimethylbenzene																				
1,2-Dichloroethane	120																			
1,2-Dichloropropane																				
1,3,5-Trimethylbenzene																				
1,4-Dichlorobenzene	100																			
1,4-dioxane																				
2-Butanone																				
(p-) 4-Isopropyltoluene																				
Acetone																				
Carbon disulfide																				
Chloroethane																				
Chloroform		570															1500			
cis-1,2-Dichloroethene	1000	3000	6700	1900		1300		10000	3500	3370	2550	6570	2630	5700	4700	2900	8400	4200	2600	3500
Cyclohexane																				
Ethylbenzene		17		16																
Isopropylbenzene																				
Methylcyclohexane																				
Methylene chloride														1200			2700		410	
n-Propylbenzene																				
sec-Butylbenzene																				
Tetrachloroethene	1700	1600																		
Toluene		70		46								35.6								
trans-1,2-Dichloroethene																				
Trichloroethene	400			1100	3600	2300	5200	1200	4700	324	171	732			1400	530		650	510	
Vinyl chloride																			280	
m,p-Xylene																				
o-Xylene																				
Total Xylenes		130		72																
Total VOCs, µg/l	**19,130**	**49387**	**55700**	**29134**	**10600**	**14300**	**10600**	**28400**	**29400**	**7114**	**5621**	**17917.6** w/ Js	**5890**	**18500**	**14600**	**8630**	**34100**	**13250**	**9800**	**10600**

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-3	<= post IRM =>								=> post extraction well rebuild												<= post extraction we
Volatile Organic Compound	9/29/06	12/17/06	3/27/07	3/18/08	10/8/08	4/10/09	9/4/09	2/25/10	4/13/10	10/29/10	2/3/11	4/16/11	10/18/11	12/12/11	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13
Detection limit											200	100	25 - 500	0.5 - 25	5 - 100	5 - 100	5 - 100	0.5 - 10	1.0	5 - 10
1,1,1-Trichloroethane	1300	1500	3800	2400	1400	1700	870	760	660	490	3700	2000	14.6	24.7	798	1730	1090	28.1	41.4	160
1,1,2-Trichloro-1,2,2-trifluoroethane													0.9	2.16	13	36	25	1.85	3.52	7.8
1,1-Dichloroethane	1200	1700	1900	1400	1400	600	840	190	500	530	1500	1000	20.1	82.2	380	1570	454	54.6	86.4	312
1,1-Dichloroethene												30	0.24	0.85	16.5	68.5	31.2	0.41	0.64	9.7
1,2,4-Trimethylbenzene					380			98	66	130	250	80		10.4	13.1	89	112	2.7	19.6	29
1,2-Dichloroethane														0.24						8.1
1,2-Dichloropropane														0.3						
1,3,5-Trimethylbenzene												50		0.29	1.3	27	20.2	2.54	1.78	2.7
1,4-Dichlorobenzene																				
1,4-dioxane																				
2-Butanone														2.22			31	1.37		
(p-) 4-Isopropyltoluene														0.16		14.5				
Acetone													1.5L	2.08L			94.8L	3	4.62	
Carbon disulfide														0.62					5.86	
Chloroethane					240							60		0.82	8.4	69	34			21.2
Chloroform																				
cis-1,2-Dichloroethene	1800	730	2400	2700	3400	1700	1600	220	880	420	2700	1700	6.6	30	435	1130	494	19.4	24.1	236
Cyclohexane														0.3				0.15	0.4	
Ethylbenzene														0.53	1.3	5	6.75	0.15	0.68	2
Isopropylbenzene														0.57					0.32	
Methylcyclohexane																				
Methylene chloride						410			64							22L	29.5L	0.24L	0.48L	2.9L
n-Propylbenzene														1.36	1		4		0.96	2.1
sec-Butylbenzene														0.98					0.8	1.6
Tetrachloroethene													0.2	0.37	1.4		3	0.29	0.92	3.9
Toluene														0.61		19.5	23	0.45	0.92	3.8
trans-1,2-Dichloroethene													0.25	0.38	2.1	6	4.5	0.22	0.46	1.4
Trichloroethene			220									70	0.86	1.78	17.9	62	29.2	1.47	3.64	10.4
Vinyl chloride	510	310	260	200	1200	190	650			400	260	140	2.57	29.9	59.8	202	179	14.1	12.4	103
m,p-Xylene					340						200				2	23.5	16.5	0.54	0.78	3.2
o-Xylene					320									1.05	2.2	36	20	1.81	3.44	4.4
Total Xylenes																				
Total VOCs, µg/l	**4810**	**4240**	**8580**	**6700**	**8680**	**4600**	**3960**	**1268**	**2170**	**1970**	**8610**	**5130**	**46.32**	**192.79**	**1753**	**5088**	**2577.35**	**133.15**	**213.64**	**922.3**
													w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-3	ll rebuild =>					<= post extraction well rebuild =>								
Volatile Organic Compound	7/24/14	12/4/14	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	5.0	5 - 10	2 - 50	5 - 100	12.5 - 250	20 - 100	2 - 10	2 - 10	10-100	2 - 10	10 - 100	2 - 10	5 - 25	10 - 100
1,1,1-Trichloroethane	164	49.7	284	67.1	1150	299	8.13	87.1	245	75.9	349	137	46.9	304
1,1,2-Trichloro-1,2,2-trifluoroethane	4				32.8			6.62				1.22		10.2
1,1-Dichloroethane	196	99.6	248	114	846	1010	103	41	290	480	441	172	352	574
1,1-Dichloroethene			3.6								9.14			7.30
1,2,4-Trimethylbenzene	13.5		23.8			26		6.29			18.8	7.27		24.6
1,2-Dichloroethane			1.05											
1,2-Dichloropropane														
1,3,5-Trimethylbenzene	2.1		2.1									1.10		
1,4-Dichlorobenzene								1.17						
1,4-dioxane							26.9				8.36	58.5	61.5	
2-Butanone														
(p-) 4-Isopropyltoluene					2.0									
Acetone			15.0L									9.82 LC		
Carbon disulfide		1.5		1.4				1.34				8.37		
Chloroethane			14.3	38.5			2.26			37.4	13.2	4.90	10.2	11.9
Chloroform														
cis-1,2-Dichloroethene	46.5	50.3	124	20.5	474	22.4	39.4	16.9	89.9		137	24.9	10.0	138
Cyclohexane			2.65											
Ethylbenzene	1.1		1		3.6									
Isopropylbenzene					1.8									
Methylcyclohexane												2.83		
Methylene chloride	9.7L	3.5L	8.65L	1.7	11.5L									
n-Propylbenzene			1.45		4.4									
sec-Butylbenzene			1.2		2.75									
Tetrachloroethene			0.55		4									
Toluene	1.6		2.65		8.15									
trans-1,2-Dichloroethene	1		1.2		4.6									
Trichloroethene	3.2	1.7	6.3	1.3	28.4		20	3.44			16.7	3.5	7.92	12.5
Vinyl chloride	10.3	16.8	29.6	30.3	145	50.1	3.97	5.5	56.7	50.5	57.4	14.3	16.5	144
m,p-Xylene			1.4											
o-Xylene	1.5		2.6	4.2	9.35									
Total Xylenes			4		17.4									
Total VOCs, µg/l	**444.8**	**219.6**	**755.45**	**289.2**	**2737.5**	**1407.5**	**203.66**	**169.36**	**681.6**	**643.8**	**1050.6**	**435.89**	**505.02**	**1226.5**
	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js
italic = found in tank contents underlined = found in soil														

CMS REMEDIATION SITE MW-4				pre IRM <==		system down 12/12/99 - 4/6/00	post IRM =>										
Volatile Organic Compound	5/29/96	6/5/96	6/15/96	10/9/96	3/20/97	6/25/99	11/1/01	8/9/03	11/7/03	3/31/04	5/28/04	9/28/04	5/22/05	1/31/06	6/9/06	9/29/06	12/17/06
Detection limit																	
1,1,1-Trichloroethane	20,000					3											
1,1-Dichloroethane	400	15	3.5			6	5.84						1.2				
1,1-Dichloroethene	570																
1,2,4-Trimethylbenzene									4						23		
1,2-Dichlorobenzene								3.32									
1,3,5-Trimethylbenzene																	
1,4-Dichlorobenzene								0.625									
2-Butanone																	
4-Isopropyltoluene																	
Acetone																	
Benzene		14	39	110	120		117	1.29	4	11	28	19	4.8		30		0.67
Carbon disulfide																	
Chloroform																	
cis-1,2-Dichloroethene		1															
Cyclohexane																	
Ethylbenzene		6	20	23	21		21.7	9.13	3						7.9		
Isopropylbenzene																	
Methyl tert-butyl ether								5.38									
Methylcyclohexane																	
Naphthalene																	
n-Propylbenzene																	
Styrene										2							
Tetrachloroethene						2											
Toluene		37	160	240	230					5	6.3	3.5			11		
Trichlorofluoromethane						5											
m,p-Xylene		48		180					3	4	2.2		1.8		14		
o-Xylene		17		67											3.3		
Total Xylenes			220		229		81.2	11.8									
Total VOCs, µg/l	**20,970**	**138** w/o B	**443**	**620**	**600**	**16**	**226**	**32** w/ Js	**14**	**22**	**37**	**23**	**8**	**nd**	**89**	**nd**	**1**
italic = found in tank contents		(method blank contaminated)															
underlined = found in soil																	

CMS REMEDIATION SITE MW-4	<= post IRM =>					==> post extraction well rebuild											
Volatile Organic Compound	3/27/07	3/17/08	4/10/09	9/4/09	2/25/10	4/13/10	10/29/10	2/3/11	4/15/11	10/18/11	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13	7/24/14
Detection limit								10	1	0.5 - 2	0.5 - 10	0.5 - 10	0.5 - 10	0.5 - 2	0.5 - 10	0.5 - 1	25
1,1,1-Trichloroethane																	
1,1-Dichloroethane										0.41	0.3	0.24	0.11				
1,1-Dichloroethene																	
1,2,4-Trimethylbenzene	1.1	6.5		6.2	18	15	11		0.5	0.92		2.43				1.07	1.57
1,2-Dichlorobenzene																	
1,3,5-Trimethylbenzene										0.26		0.58		0.28	0.18	0.19	0.32
1,4-Dichlorobenzene																	
2-Butanone													1.31		4.85		2.99
4-Isopropyltoluene									0.6								
Acetone										4.75B	18.3B	18.7B	8.99L		11.9	23.1	24.7
Benzene	0.59	26		28			15			13.5	3.81	13.1	0.87	0.41			16.4
Carbon disulfide										0.19							
Chloroform												0.2		0.22			
cis-1,2-Dichloroethene																	
Cyclohexane										1.68	0.26	3.49	0.56	5.15	1.6	1.46	3.41
Ethylbenzene		3.3	4.4		10	11			2	0.97	0.72	1.49		2.17	1.36	0.19	1.27
Isopropylbenzene	1.2								1					0.35	0.2	0.14	0.18
Methyl tert-butyl ether									1.3	2.18	1.49	0.98	0.18	0.16			
Methylcyclohexane																	
Naphthalene	1.4								1.1								
n-Propylbenzene									0.6					0.21	0.3		0.19
Styrene																	
Tetrachloroethene																	
Toluene		16		6.8						4.96	1.01	4.9					1.34
Trichlorofluoromethane																	
m,p-Xylene				11	16	23	17	14		1.83		3.63		1.04		0.46	1.21
o-Xylene		4.7								1.23	0.82	1.79		0.65			0.46
Total Xylenes																	
Total VOCs, µg/l	**4**	**57**	**4**	**52**	**44**	**49**	**43**	**14**	**7**	**28** w/ Js	**8** w/ Js	**33** w/ Js	**3.03** w/ Js	**12.2** w/ Js	**20.39** w/ Js	**26.61** w/ Js	**54.04** w/ Js
italic = found in tank contents underlined = found in soil																	

CMS REMEDIATION SITE MW-4	<= post extraction well rebuild =>												
Volatile Organic Compound	12/4/14	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	0.5 - 1	0.5 - 10	0.5 - 10	0.5 - 10	2 - 10	2 - 10	2 - 20	2 - 10	2 - 10	2 - 20	2 - 10	2 - 10	2 - 10
1,1,1-Trichloroethane													
1,1-Dichloroethane												1.63	
1,1-Dichloroethene													
1,2,4-Trimethylbenzene		0.79		0.84								1.10	
1,2-Dichlorobenzene													
1,3,5-Trimethylbenzene	0.11	0.14		0.11									
1,4-Dichlorobenzene													
2-Butanone		1.17						10.4		6.32	14.8	5.63	
4-Isopropyltoluene													
Acetone			2.50L	18.1L				49.2L		42.7L	54.8L	27.8L	12.5
Benzene	14.7	17.7	6.78	17.1	23.8	21.2	6.95	9.81		7.61	51.8	55.0	22.7
Carbon disulfide													
Chloroform													
cis-1,2-Dichloroethene	0.12												
Cyclohexane	1.99	1.81	0.54	2.27							27.7	34.0	33.9
Ethylbenzene	0.53	0.49	0.26	0.99							2.10	3.26	1.93
Isopropylbenzene	0.12	0.17		0.23									
Methyl tert-butyl ether			0.96										
Methylcyclohexane											12.6	14.5	15.5
Naphthalene	0.79	0.19	1.77B	1.06									
n-Propylbenzene	0.13	0.13		0.22									
Styrene				0.16									
Tetrachloroethene													
Toluene	1.23	0.76	0.29	1.8							5.19	5.71	6.81
Trichlorofluoromethane													
m,p-Xylene	0.93	0.4	0.24	0.62							3.79	4.51	2.47
o-Xylene	0.64	0.66	0.54	1.21							2.11	3.41	2.45
Total Xylenes		1.06	0.78	1.83									
Total VOCs, µg/l	**21.29** w/ Js	**25.47** w/ Js	**13.15** w/ Js	**28.44** w/ Js	**23.8** w/ Js	**21.2** w/ Js	**6.95** w/ Js	**20.21** w/ Js	**nd** w/ Js	**13.93** w/ Js	**120.09** w/ Js	**128.75** w/ Js	**98.26** w/ Js
italic = found in tank contents underlined = found in soil													

CMS REMEDIATION SITE MW-5	pre IRM <==						system down 12/12/99 to 4/6/00			post IRM =>						
Volatile Organic Compound	5/29/96	6/5/96	6/15/96	10/9/96	3/20/97	2/11/98	8/12/98	6/25/99	11/1/01	9/25/02	6/29/03	8/9/03	11/7/03	3/31/04	5/28/04	9/28/04
Detection limit					200											
1,1,1-Trichloroethane	8900	120	120				110	320								
1,1,2-Trichloroethane		2														
1,1-Dichloroethane	3300	2500	2000	3000	3500	4400	2700	3800	2380	1870	2020	1460	2100	850	1800	2200
1,1-Dichloroethene		89	59													
1,2-Dichloroethane		31														
Benzene		2	1.2										54			
Chloroethane													100			
Chloroform																
cis-1,2-Dichloroethene	790	740	960	1200	1300	1100	820	920	110	206	552	122	430	240	530	380
Cyclohexane																
Ethylbenzene		2														
Tetrachloroethene		200	260	240												
Toluene		5	4													
trans-1,2-Dichloroethene																
Trichloroethene					270	270							110	210	170	
Vinyl chloride		320	320	790	730	930	450		141	386	605	158	640	190	720	820
o-Xylene		6														
Total Xylenes			2.4													
Total VOCs, µg/l	**12990**	**4028**	**3726.6**	**5230**	**5800**	**6700**	**4080**	**5040**	**2631**	**2462**	**3177**	**1740**	**3434**	**1490**	**3220**	**3400**
																originally mislabeled mw-6 in
italic = found in tank contents																
underlined = found in soil																

CMS REMEDIATION SITE MW-5	<= post IRM =>								<= post IRM =>		
Volatile Organic Compound	5/22/05	1/31/06	6/9/06	9/29/06	12/17/06	3/27/07	3/17/08	10/2/08	4/10/09	9/4/09	2/25/10
Detection limit											
1,1,1-Trichloroethane											
1,1,2-Trichloroethane											
1,1-Dichloroethane	1800	2200	1400	1500	1800	950	1400	1900	780	880	590
1,1-Dichloroethene											
1,2-Dichloroethane											
Benzene											
Chloroethane						93					
Chloroform				170							
cis-1,2-Dichloroethene	390	160	100		430		430	500	300	620	200
Cyclohexane											
Ethylbenzene											
Tetrachloroethene											130
Toluene											
trans-1,2-Dichloroethene											
Trichloroethene	120					110					
Vinyl chloride	500	430	200	100	780	290	700	890	290	710	330
o-Xylene											
Total Xylenes											
Total VOCs, µg/l	**2810**	**2790**	**1700**	**1770**	**3010**	**1443**	**2530**	**3290**	**1370**	**2210**	**1250**
	field/lab report										
italic = found in tank contents											
underlined = found in soil											

CMS REMEDIATION SITE MW-5	==> post extraction well rebuild										<= post extraction well rebuild =>					
Volatile Organic Compound	4/13/10	10/29/10	4/15/11	6/8/11	7/21/11	10/18/11	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13	7/24/14	12/4/14	6/7/15	12/28/18
Detection limit			10	50	50	6 - 125	5 - 100	12 - 125	12 - 250	12.5 - 50	25 - 100	25 - 50	25 - 50	25 - 50	.5 - 10	10 - 100
1,1,1-Trichloroethane							7.2								10.1	
1,1,2-Trichloroethane																
1,1-Dichloroethane	1200	1000	81	310	560	268	265	716	870	902	1410	1170	758	919	22.1	592
1,1-Dichloroethene							6.2	25.5	11	6.75	10	22			0.65	
1,2-Dichloroethane						4.25	4.8	9.5	12.5	12.8	17.5	13	9		0.2	7.26
Benzene									4.25							
Chloroethane						8.38	59.4	41.2	104	32.5	91.5	24	37			56.8
Chloroform																
cis-1,2-Dichloroethene	400	260	26	86	150	44.1	57.8	125	149			281		81.5	30.2	44.1
Cyclohexane							1.6	6.5	6	6		7.5	5			
Ethylbenzene																
Tetrachloroethene															0.21	
Toluene																
trans-1,2-Dichloroethene						1.38	2.1	2.5	4.25	3.25		6			0.29	
Trichloroethene			3	20	20	4	12.7	25.5	4.25	495	9	28			3.13	
Vinyl chloride	360	520	26	140	220	24.6	120	244	408		664	590	374	524	5.56	275
o-Xylene																
Total Xylenes																
Total VOCs, µg/l	**1960**	**1780**	**136** w/ J values	**556** w/ Js	**950** w/ Js	**354.71** w/ Js	**536.8** w/ Js	**1195.7** w/ Js	**1573.25** w/ Js	**1458.3** w/ Js	**2202** w/ Js	**2154** w/ Js	**1264.5** w/ Js	**1537** w/ Js	**72.62** w/ Js	**975.16** w/ Js
italic = found in tank contents underlined = found in soil																

CMS REMEDIATION SITE MW-6	pre IRM <==					system down 12/12/99 - 4/6/00		post IRM =>										
Volatile Organic Compound	5/31/96	6/15/96	10/9/96	3/20/97	2/11/98	6/25/99	11/1/01	9/25/02	6/29/03	8/9/03	5/28/04	9/28/04	5/22/05	1/31/06	6/9/06	9/29/06	12/17/06	3/27/07
Detection limit																		
1,1,1-Trichloroethane																		
1,1,2-Trichloro-1,2,2-trifluoroethane																		
1,1-Dichloroethane	10	27	31	28	66	32	10.3	1.63	8.55	19.2	7.9	17	35	23	16	23	16	21
1,2,4-Trimethylbenzene																		
1,2-Dichloroethane																		
Acetone																		
Benzene			10	8					5.26	2.02				1.8	2.5		0.66	0.81
Bromomethane						15			2.05									
Chloroethane								8.72		0.626	11	21						
Chloroform		2.5																
Chloromethane										1.79								
cis-1,2-Dichloroethene		76	60	24	40	55	10.8	3.36	4.06	6.93	22	17	15	6	7	7.4	4.6	6.6
Cyclohexane																		
Ethylbenzene		1.3	11	2														
Isopropylbenzene																		
Methylcyclohexane																		
Methylene chloride																		
Styrene																		
Tetrachloroethene		5.2																
Toluene	21	4.3	34	1					0.408	0.908								
Trichloroethene		9.9	6	3	5													
Vinyl chloride		9.7					1.69	9.39			28	14		2.2	1.6			
m,p-Xylene																		
m-Xylene	17		32															
o-Xylene																		
p-Xylene	38		93															
Total Xylenes		11		34														
Total VOCs, µg/l	**86**	**147**	**277**	**100**	**111**	**102**	**23**	**23**	**20**	**31**	**69**	**69**	**50**	**33**	**27**	**30**	**21**	**28**
									w/ J values		mislabeled mw-5							
italic = found in tank contents											in field/lab report							
underlined = found in soil																		

CMS REMEDIATION SITE MW-6	<= post IRM =>					==> post extraction well rebuild										
Volatile Organic Compound	3/17/08	10/2/08	4/10/09	9/4/09	2/25/10	4/13/10	10/29/10	2/3/11	4/15/11	10/18/11	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13
Detection limit									5	0.5 - 10	0.5-10	0.5 - 10	0.5 - 10	0.5 - 2	0.5 - 1	0.5 - 1
1,1,1-Trichloroethane																79.7
1,1,2-Trichloro-1,2,2-trifluoroethane																16
1,1-Dichloroethane	17	19	17	22	15	25	48	23	26	21.9	30.2	24.6	20.4	18.1	8.99	77.9
1,2,4-Trimethylbenzene													0.93	0.19		
1,2-Dichloroethane										0.47	0.22	0.16				0.4
Acetone											4.56LC					1.59LC
Benzene	3.9		21				2.6	3.1		4.85		8.67	16.1	18.7	1.17	0.46
Bromomethane																
Chloroethane										1.88	1.18	0.53				
Chloroform													0.14	0.17		
Chloromethane													2.12	3.08		
cis-1,2-Dichloroethene	3.8	6.6	2.7	4	4.4	12	19	8.2	13	14.6	13.6	9.29	7.46	5.26	3.12	14.1
Cyclohexane										0.58	0.63	0.75	2.18	3.41		0.15
Ethylbenzene			1.7							0.22		0.54	1.39			
Isopropylbenzene													0.1			
Methylcyclohexane																
Methylene chloride					1.5	1.5							0.26LC	0.18LC		
Styrene										0.72						
Tetrachloroethene																1.28
Toluene													0.14			
Trichloroethene										0.34	0.5	0.37	0.39	0.31		0.46
Vinyl chloride										1.28						0.61
m,p-Xylene													1.3	0.24		
m-Xylene																
o-Xylene													2.19	2.27		
p-Xylene																
Total Xylenes																
Total VOCs, µg/l	**25**	**26**	**42**	**26**	**21**	**39**	**70**	**34**	**39**	**47** w/ J s	**46.33** w/ J s	**44.91** w/ J s	**54.84** w/ J s	**51.73** w/ J s	**13.57**	**191.06** w/ J s
italic = found in tank contents underlined = found in soil																

CMS REMEDIATION SITE MW-6	<= post extraction well rebuild =>													
Volatile Organic Compound	7/24/14	12/4/14	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	1	0.5	.5 - 10	.5 - 10	.50 - 10	2 - 10	2 - 20	2 - 20	2 - 20	2 - 20	2 - 10	2 - 10	2 - 10	2 - 10
1,1,1-Trichloroethane	18.7	3.85	3.9	2.99	1.2									
1,1,2-Trichloro-1,2,2-trifluoroethane	0.9													
1,1-Dichloroethane	38.2	25	58.3	56.1	50	43	42.4	37.4	1.11	59.3	35.8	34.1	44.8	45.5
1,2,4-Trimethylbenzene					0.22									
1,2-Dichloroethane		0.71	1.56	1.13	1.81						1.05		1.23	
Acetone			2.07LC		2.66LC				5.24					
Benzene	1.16	4.37	1.24	2.34	7.9	7.58	5.51	11.1	0.604	1.6		1.15	3.75	2.99
Bromomethane														
Chloroethane		0.37		2.46	0.75		1.31							1.76
Chloroform				0.12										
Chloromethane														
cis-1,2-Dichloroethene	11.8	15.8	46	33.2	52.9	34.9	31.3	30	44.1	39.5	24.1	23.3	35.2	26.1
Cyclohexane	0.94	0.68	0.48	1.56	2.19								5.17	
Ethylbenzene		0.31		0.21	0.55			1.15						
Isopropylbenzene														
Methylcyclohexane							1.26						1.46	1.09
Methylene chloride	3.34	1.15												
Styrene														
Tetrachloroethene	0.48	0.16	0.22	0.48	0.15									
Toluene														
Trichloroethene	0.42	0.19	0.39	0.21	0.38									
Vinyl chloride		2.54	2.49	2.44	8.03		1.61	1.16	1.29	2.95		1.29	6.30	2.94
m,p-Xylene					0.36									
m-Xylene														
o-Xylene		0.17		0.45	0.8									
p-Xylene														
Total Xylenes					1.16									
Total VOCs, µg/l	**75.94** w/ J s	**55.41** w/ J s	**114.76** w/ J s	**104.14** w/ J s	**128.88** w/ J s	**85.48**	**83.39** w/ J s	**80.81** w/ J s	**52.344** w/ J s	**103.35**	**60.95** w/ J s	**59.84** w/ J s	**97.91** w/ J s	**80.38** w/ J s
italic = found in tank contents underlined = found in soil														

CMS REMEDIATION SITE MW-7	pre IRM <=			=> post IRM	system down 12/12/99 to 4/6/0(		post IRM =>				<= post IRM =>							
Volatile Organic Compound	10/9/96	3/20/97	2/11/98	8/12/98	6/25/99	11/1/01	9/25/02	6/29/03	8/9/03	11/7/03	3/31/04	5/28/04	9/28/04	5/22/05	1/31/06	6/9/06	9/29/06	12/17/06
Detection limit																		
1,1,1-Trichloroethane																		
1,1,2-Trichloro-1,2,2-trifluoroethane																		
1,1-Dichloroethane	1500	1900	2000	690	1100	1890	210	743	676	1300	700	610	720	850	910	680	800	1300
1,1-Dichloroethene																		
1,2-Dichloroethane		100		61		52.5		45.6		100	51						64	
Acetone																		
Benzene																		
Chloroethane							31.3											
Chloroform											53						54	
cis-1,2-Dichloroethene																		
Cyclohexane																		
Methylene chloride						149									74		60	120
Trichloroethene								34.1										
Trichlorofluoromethane								31.5										
Vinyl chloride								16					62				100	
Total VOCs, µg/l	**1500**	**2000**	**2000**	**751**	**1100**	**2091.5**	**241.3**	**870.2**	**676**	**1400**	**804**	**610**	**782**	**850**	**984**	**680**	**1078**	**1420**

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-7	<= post IRM =>						==> post extraction well rebuild									<= post extraction well rebuild =>		
Volatile Organic Compound	3/27/07	3/17/08	10/2/08	4/10/09	9/4/09	2/25/10	4/13/10	10/29/10	2/3/11	4/15/11	12/12/11	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13	7/24/14
Detection limit										100	12 - 250	12.5	12.5	10 - 200	10 - 40	25 - 50	10 - 20	10 - 20
1,1,1-Trichloroethane																		
1,1,2-Trichloro-1,2,2-trifluoroethane												8.00	2.75	2.6				
1,1-Dichloroethane	530	1300	810	1500	540	1200	1000	580	740	1500	684		1080	449	260	761	1100	472
1,1-Dichloroethene													20				5.2	
1,2-Dichloroethane	34		100							80	49	41.8	67.2	21	6.8	34.5		24
Acetone														46				
Benzene											12.8	6.25		3.4				
Chloroethane											8.75			13.8			8.6	15
Chloroform																		
cis-1,2-Dichloroethene										30	25.5	23.2		11.8	6.4	16	27.4	23
Cyclohexane													34.8	2.6				
Methylene chloride							300						24.2LC	11LC	9.6LC	22.5LC	4.6	
Trichloroethene										40	4.25	10.2	39.2	16.6		12	32	14.8
Trichlorofluoromethane																		
Vinyl chloride	32									50	35.5	35.8	47.2	20.6	16	22.5	48.4	22.2
Total VOCs, µg/l	**596**	**1300**	**910**	**1500**	**540**	**1200**	**1300**	**580**	**740**	**1700**	**819.8**	**125.25**	**1291.15**	**587.4**	**292.4**	**846**	**1226.2**	**571**
											w/J s	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-7	>					<= post extraction well rebuild =>							
Volatile Organic Compound	12/4/14	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	5 - 10	5 - 100	2.50 - 100	2.50 - 50	5 - 12	2 - 20	2 - 20	2 - 20	2 - 20	2 - 10	2 - 10	10 - 100	2 - 10
1,1,1-Trichloroethane													1.47
1,1,2-Trichloro-1,2,2-trifluoroethane	1.9												1.19
1,1-Dichloroethane	165	145	122	49.4	405	12.9	68.3	129	88.1		14.0	470	5.46
1,1-Dichloroethene													
1,2-Dichloroethane	8.1	8.9	2.4	2.5			2.92	8.12	2.5		1.27	37.3	
Acetone		10.4LC						7.22					
Benzene													
Chloroethane	6.4		2.2				4.78		7.33		3.91		
Chloroform													
cis-1,2-Dichloroethene	5.3	7.3	5.3	1.9	5.03		1.24	7.18	5.8	1.81	1.58	37.0	
Cyclohexane													
Methylene chloride		6.50LC	.85LC										
Trichloroethene	1.7	3.9	1.5	1.15									
Trichlorofluoromethane													
Vinyl chloride	7.1	7.7		1.85			2.01	5.53	3.55		2.13	89.3	
Total VOCs, µg/l	**195.5**	**172.8**	**133.4**	**56.8**	**410.03**	**12.9**	**79.25**	**157.05**	**107.28**	**1.81**	**22.89**	**633.6**	**8.12**
	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s	w/J s

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-8	pre IRM <=		system down 12/12/99 to 4/6/00			post IRM =>										
Volatile Organic Compound	10/9/96	3/20/97	6/25/99	11/1/01	9/25/02	8/9/03	11/7/03	3/31/04	5/28/04	5/22/05	1/31/06	6/9/06	9/29/06	12/17/06	3/27/07	3/17/08
Detection limit		2														
1,1,1-Trichloroethane																
1,1,2-Trichloro-1,2,2-trifluoroethane																
1,1-Dichloroethane	120	34	76	34.4	72.3	67.3	61	28	45	38	16	39	36	31	25	17
1,1-Dichloroethene																
1,2-Dichloroethane					1.13											
Acetone																
Benzene				4.55										1.6		
Bromomethane			76													
Chlorobenzene																
Chloromethane																
cis-1,2-Dichloroethene	110	30	130	33	60.2	72.4	54	35	57	42	4.3	45	21	33	25	26
cis-1,3-dichloropropene																
Cyclohexane																
Methyl tert-butyl ether					1.61											
Methylene chloride																
Styrene																
trans-1,2-Dichloroethene																
Trichloroethene	9	8			2.75	1.88			5.1	3.7	1.4	2.9				1.6
Vinyl chloride	10			2.31					4.4	2.3		7.6		2.4		2.5
Total VOCs, µg/l	**249**	**72**	**282**	**74.26**	**137.99**	**141.58** w/ Js	**115**	**63**	**111.5**	**86**	**21.7**	**94.5**	**57**	**68**	**50**	**47.1**

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-8	<= post IRM =>				==> post extraction well rebuild											
Volatile Organic Compound	10/2/08	4/10/09	9/4/09	3/24/10	4/13/10	10/29/10	4/15/11	10/18/11	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13	7/24/14	12/4/14
Detection limit						5	5	0.5 - 5	0.5 - 5	0.5 - 1	0.5 - 2	0.5 - 2	25 - 50	1 - 2	1 - 2	1 - 2
1,1,1-Trichloroethane														7.92		
1,1,2-Trichloro-1,2,2-trifluoroethane														2.92		
1,1-Dichloroethane	28	27	30	30	18	82	11	61.9	43.8	29.2	58.4	80.2	198	32.9	50.9	44.4
1,1-Dichloroethene								1.24	0.54		1.71	1.69		0.4	1.28	0.6
1,2-Dichloroethane								1.43	0.48	0.49	1.19	1.72			1.02	0.78
Acetone																
Benzene		0.86						4.41	0.78	0.17	0.85	2.62		0.58	0.96	1.9
Bromomethane																
Chlorobenzene								0.1								
Chloromethane														0.82		1.34
cis-1,2-Dichloroethene	34	31	38	34	19	75	12	65.7	32.2	30.2	52.6	63.8	120	15.8		34
cis-1,3-dichloropropene								0.96							51.5	
Cyclohexane									1.2	0.42	0.65	1.91		1.74	2.54	2.02
Methyl tert-butyl ether								0.37	0.19	0.52		0.26				
Methylene chloride					12						0.26LC	0.18LC	21LC		2.88LC	0.94LC
Styrene								0.29								
trans-1,2-Dichloroethene								0.47		0.24	0.47	0.43			0.38	
Trichloroethene		1						0.69	0.52	0.68	0.62	0.52		0.32	0.56	0.28
Vinyl chloride						12	12	8.45	1.18	5.19	17.3	21.1	41	2.8	17.5	6.96
Total VOCs, µg/l	**62**	**59.86**	**68**	**64**	**49**	**169**	**35**	**146.01** w/ Js	**80.89** w/ Js	**67.11** w/ Js	**134.41** w/ Js	**174.64** w/ Js	**359** w/ Js	**66.2** w/ Js	**126.64** w/ Js	**92.28** w/ Js

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-8	<= post extraction well rebuild =>										
Volatile Organic Compound	6/7/15	12/17/15	5/2/16	7/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	1 - 20	1 - 20	1 - 20	2 - 10	2 - 20	2 - 20	2 - 20	1 - 10	2 - 20	2 - 20	2 - 20
1,1,1-Trichloroethane											
1,1,2-Trichloro-1,2,2-trifluoroethane											
1,1-Dichloroethane	48.9	77.4	22.7	47.8	31.4	33.5	21.7	15.7	32.5	38.4	32.2
1,1-Dichloroethene	1.74	1.26			1.08						
1,2-Dichloroethane	0.98	1.52									
Acetone	3.00LC		4.02LC					10.5L			12.3L
Benzene	0.3	0.32	0.5				2			1.02	0.790
Bromomethane											
Chlorobenzene											
Chloromethane											
cis-1,2-Dichloroethene	41.8	45.9	3.06	33.4	28.3	21.8	14.4	14.1	23.6	28.8	8.24
cis-1,3-dichloropropene											
Cyclohexane	0.38	1.04									
Methyl tert-butyl ether											
Methylene chloride	.76LC										
Styrene											
trans-1,2-Dichloroethene	0.38										
Trichloroethene	0.64	0.56									
Vinyl chloride	14	17.9		12.5	13.9	5.23	4.1	1.6	11.1	15.0	3.74
Total VOCs, µg/l	**109.12** w/ Js	**145.9** w/ Js	**26.26** w/ Js	**93.7** w/ Js	**74.68** w/ Js	**60.53** w/ Js	**42.2** w/ Js	**31.4** w/ Js	**67.2**	**83.22**	**44.97**

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-9	<= pre IRM			system down 12/12/99 to 4/6/00					post IRM =>								
Volatile Organic Compound	10/12/98	5/28/99	10/22/99	6/13/00	11/1/01	9/25/02	6/30/03	8/9/03	11/7/03	3/31/04	5/28/04	9/26/04	5/22/05	1/31/06	6/9/06	9/29/06	12/17/06
Detection limit																	
1,1,1-Trichloroethane	11000	1200	2500	1400	3200	1730	4330	1070	1300	470	410	1200		210	950	620	400
1,1,2-Trichloro-1,2,2-trifluoroethane																	
1,1,2-Trichloroethane																	
1,1-Dichloroethane	8900	1100	4300	1600	2480	3840	3060	1280	3300	590	440	1900	2500	460	2000	1800	690
1,1-Dichloroethene				110		183										150	
1,2,4-Trimethylbenzene																	
1,2-Dichloroethane				180		27.1											
1,4-Dioxane																	
Acetone																	
Bromomethane							412										
Chloroethane																	
Chloroform																130	
cis-1,2-Dichloroethene	4300	580	2200	930	1500	3190	4310	1410	2400	410	640	2200	1100	250	1400	1800	860
Cyclohexane																	
Methylene chloride									520					32			
n-Propylbenzene																	
Tetrachloroethene		330															
Toluene																	
trans-1,2-Dichloroethene																	
Trichloroethene	5600		1100	1000	835	312	563	105	670	100	170	490	120	52	230	680	110
Vinyl chloride			390			531	226	60.5	510	56	55	790	260	88	460	880	140
o-Xylene																	
p-Xylene							83.1										
Total VOCs, µg/l	**29800**	**3210**	**10490**	**5220**	**8015**	**9813.1**	**12984.1** w/ Js	**3925.5** w/ Js	**8700**	**1626**	**1715**	**6580**	**3980**	**1092**	**5040**	**6060**	**2200**

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-9	<= post IRM =>						==> post extraction well rebuild									
Volatile Organic Compound	3/27/07	3/18/08	10/7/08	4/10/09	9/4/09	2/25/10	4/13/10	10/29/10	2/3/11	4/16/11	10/18/11	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12
Detection limit									100	10	250-5000	12 - 250	13 - 250	25 - 500	2.5 - 10	25 - 50
1,1,1-Trichloroethane	490	470	1400	1000	810	210	360	210	620	33	830	229	138	189	15.4	106
1,1,2-Trichloro-1,2,2-trifluoroethane												3.75		10.2		
1,1,2-Trichloroethane																
1,1-Dichloroethane	1100	870	2700	3100	2700	190	390	690	850	76	5860	581	516	690	139	943
1,1-Dichloroethene												16.2	24.5	13.2	2.85	22
1,2,4-Trimethylbenzene							57			7			13	6.25		
1,2-Dichloroethane							510						4	5	2.6	
1,4-Dioxane																
Acetone														73		
Bromomethane																
Chloroethane										5						
Chloroform																
cis-1,2-Dichloroethene	350	540	1900	820	1100	270		260	1200	88	960	324	242	211	75.8	398
Cyclohexane														6		
Methylene chloride				160	230									28LC	2.47LC	24
n-Propylbenzene																
Tetrachloroethene		200										5.25	5		0.75	8
Toluene													6.5	5.25		
trans-1,2-Dichloroethene														9	0.6	
Trichloroethene	56	78						90		8	70	92.8	114	56.8	28	241
Vinyl chloride	160	120	1600	500	750		120	230	240	21	615	143	72.8	192	18.3	118
o-Xylene														4.25		
p-Xylene																
Total VOCs, µg/l	**2156**	**2278**	**7600**	**5580**	**5590**	**670**	**1437**	**1480**	**2910**	**238**	**8335** w/ Js	**1395** w/ Js	**1135.8** w/ Js	**1495.2** w/ Js	**283.85** w/ Js	**1860** w/ Js

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-9	<= post extraction well rebuild =>														
Volatile Organic Compound	4/5/13	7/24/14	12/4/14	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	10 - 20		5 - 10	5 - 100	2.50 - 50	2.50 - 50	10 - 100	2 - 20	2 - 20	4 - 20	10 - 100	10 - 50	4 - 20	5 - 25	5 - 25
1,1,1-Trichloroethane	258	170	77.7	47.8	17	30.6	58	6.98	20.3	76	55.3	8.96	46.4	27.2	36.6
1,1,2-Trichloro-1,2,2-trifluoroethane	7	8.1	3.9			1.95				4.61	5.33		2.22		
1,1,2-Trichloroethane		1.8													
1,1-Dichloroethane	365	833	228		84.6	272	520	92.3	231	398	495	102	318	497	332
1,1-Dichloroethene	8.6	41.8	17.9	15.3	3.05	14.1	12.7		9.8	21.6	25		11.3	7.75	3.75
1,2,4-Trimethylbenzene	9.4	2													
1,2-Dichloroethane	4.8	6.6	3.3	3.9		2.7			2.13	3.24			3.14	3.75	
1,4-Dioxane								20.4					34.1		
Acetone						6.15LC				15.4					
Bromomethane															
Chloroethane		20.1	7.2	10.6		6.2		1.96	9.82	17.1	15.5		12.1	13.5	7.32
Chloroform															
cis-1,2-Dichloroethene	323	606	157	120	26.9	135	200	34.1	97	210	177	15.7	121	130	34.7
Cyclohexane															
Methylene chloride	5.4		3LC	6.20LC											
n-Propylbenzene		1													
Tetrachloroethene			3.9	1.7	0.5	2.25									
Toluene	6	1.8													
trans-1,2-Dichloroethene	2.8	9.1	3	3.2	0.65	2.3			2.08	5.09	6.08		3.86	6.53	3.13
Trichloroethene	39.4	223	189	89.8	37	192	73.7	16.9	125	161	158	7.98	98.6		20.2
Vinyl chloride	153	270	165	138	25.4	60.6	128	3.45	57.2	156	190	9.69	73.0	123	61.8
o-Xylene	4	1.2													
p-Xylene															
Total VOCs, µg/l	**1213.2** w/ Js	**2202.8** w/ Js	**857.7** w/ Js	**431.7** w/ Js	**195.1** w/ Js	**719.7** w/ Js	**992.4**	**176.09** w/ Js	**554.33** w/ Js	**1068.04** w/ Js	**1127.21** w/ Js	**144.33** w/ Js	**723.72** w/ Js	**808.73** w/ Js	**499.5** w/ Js
italic = found in tank contents															
underlined = found in soil															

CMS REMEDIATION SITE MW-10	<= Post IRM =>												
Volatile Organic Compound	1/13/99	6/25/99	11/1/01	9/25/02	6/29/03	8/9/03	5/28/04	5/22/05	1/31/06	6/9/06	9/29/06	10/2/08	4/10/09
Detection limit													
1,1,2-Trichloro-1,2,2-trifluoroethane													
1,1-Dichloroethane													
Acetone													
Benzene													
Chloroform													
Methylene chloride		5.0L											
Toluene													
Total VOCs, µg/l	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**

italic = found in tank contents

underlined = found in soil

CMS REMEDIATION SITE MW-10	=> post extraction well rebuild											
Volatile Organic Compound	4/13/10	4/15/11	10/18/11	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13	7/24/14	12/4/14	6/7/15	12/17/15
Detection limit			0.5 - 10	0.5 - 10	25 - 500	0.5 - 10	0.5 - 10	0.5 - 10	0.5 - 2	0.5 - 2	.50 - 10	2.5 - 50
1,1,2-Trichloro-1,2,2-trifluoroethane							0.14	0.18				
1,1-Dichloroethane						0.12			0.16			
Acetone			1.04L		3.99L	5.12L	2.69L	2.84L	5.05L	5.21L	23.4L	1.97L
Benzene						0.17	0.24					
Chloroform										0.58		
Methylene chloride	1.4L				0.21L	0.22L						
Toluene												
Total VOCs, µg/l	**nd**	**nd**	**nd** w/ Js	**nd**	**nd** w/ Js	**0.29** w/ Js	**0.38** w/ Js	**0.18** w/ Js	**0.16** w/ Js	**0.58**	**nd**	**nd**

italic = found in tank contents

underlined = found in soil

CMS REMEDIATION SITE MW-10	<== post extraction well rebuild ==>									
Volatile Organic Compound	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	.50 - 10	2 - 5	2 - 20	2 - 20	2 - 20	2 - 20	2 - 5	2 - 10	2 - 10	2 - 10
1,1,2-Trichloro-1,2,2-trifluoroethane										
1,1-Dichloroethane										
Acetone	1.54L				13.4 L					7.54L
Benzene										
Chloroform										
Methylene chloride										
Toluene		10.3								
Total VOCs, µg/l	**nd**	**10.3**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-11	<= post IRM =>													=> post extraction well rebuild						
Volatile Organic Compounds	1/13/99	6/25/99	11/1/01	9/25/02	6/29/03	8/9/03	5/28/04	5/22/05	1/31/06	6/9/06	9/29/06	10/2/08	4/10/09	4/13/10	4/15/11	10/18/11	3/22/12	6/30/12	10/2/12	12/18/12
Detection limit															*1*	*0.5 - 10*	*0.5 - 11*	*10*	*0.5 - 10*	*0.5 - 2.5*
1,1,1-Trichloroethane																				
1,1,2-Trichloro-1,2,2-trifluoroethane																				
1,1-Dichloroethane																				
1,1-Dichloroethene																				
1,2,4-Trimethylbenzene																	0.47			
1,3,5-Trimethylbenzene																	0.36			
Acetone																1.13LC		2.74L	2.57L	2.02L
Carbon disulfide																				0.13
Chloroethane																				
cis-1,2-Dichloroethene																				
Cyclohexane																	0.46	0.26	0.35	0.2
Methylene chloride																		.29L	.18L	
n-Propylbenzene														1.4L						
Tetrachloroethene																				
Trichloroethene																				
Total VOCs	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**1.29** w/ Js	**0.26** w/ Js	**0.35** w/ Js	**0.33** w/ Js
italic = found in tank contents																				** field mi
underlined = found in soil																				

CMS REMEDIATION SITE MW-11												<= post extraction well rebuild =>			
Volatile Organic Compounds	4/5/13	7/24/14	12/4/14	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	*0.5*	*0.5*	*0.5*	*.50 - 10*	*.50 - 10*	*.50 - 10*	*2 - 20*	*2 - 20*	2 - 20	2 - 20	2 - 20	2 - 10	2 - 10	2 - 10	2 - 10
1,1,1-Trichloroethane	17.7														
1,1,2-Trichloro-1,2,2-trifluoroethane	14.3														
1,1-Dichloroethane	19.3	0.54	0.48		0.35										
1,1-Dichloroethene	0.41														
1,2,4-Trimethylbenzene															
1,3,5-Trimethylbenzene															
Acetone	2.25L				2.37L	1.53L						10.6 L			
Carbon disulfide															
Chloroethane			0.11												
cis-1,2-Dichloroethene	0.41														
Cyclohexane		0.25			0.46										
Methylene chloride															
n-Propylbenzene															
Tetrachloroethene	0.41														
Trichloroethene	0.1														
Total VOCs	** w/ Js	**0.79** w/ Js	**0.59** w/ Js	**nd**	**0.81** w/ Js	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**	**nd**
italic = found in tank contents	s-ID or contaminated														
underlined = found in soil															

CMS REMEDIATION SITE MW-12	post IRM		=> post extraction well rebuild											
Volatile Organic Compound	11/20/10	2/3/11	4/15/11	6/10/11	7/21/11	10/18/11	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13	7/24/14	12/4/14
Detection limit	100	5	10	50	20	6 - 125	5 - 100	5 - 100	1 - 10	2.5 - 10	2.5 - 5	2.5 - 5	2.5	1 - 2
1,1-Dichloroethane	120	90	190	270	140	178	175	168	66	134	160	74.4	24.5	81.8
1,2-Dichloroethane			4			5	4.1	4.2	3.35	4.1	4.65	3.4	1.7	4
1,4-Dioxane														
Acetone									14					
Benzene						1.5								
Chloroethane	16		4			37.6	19.4	32	90.8	21.6	29.2	48.8	8.5	9.48
Chloromethane														
cis-1,2-Dichloroethene		9.4	26	30	10	9.38	20.3	23.5	9.05	15.9	20.6	9.35	2.05	18.9
Cyclohexane						2.38		2.2	1.7			1.4	0.75	0.36
Methylene chloride								11.8LC	4.5LC	2.25LC	2.65LC	0.95LC		1.34LC
Trichloroethene											0.75			
Vinyl chloride		27	88	260	47	43.2	119	128	53.6	71.4	107	77	26.4	109
Total VOCs, µg/l	**136** w/ Js	**126**	**312.00** w/ Js	**560.00**	**197.00** w/ Js	**277.06** w/ Js	**337.8** w/ Js	**357.9** w/ Js	**238.5** w/ Js	**247** w/ Js	**322.2** w/ Js	**214.35** w/ Js	**63.9** w/ Js	**224.14** w/ Js

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-12	<= post extraction well rebuild =>											
Volatile Organic Compound	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	1 - 20	1 - 20	.50 - 10	2 - 10	2 - 10	2 - 20	2 - 20	2 - 20	2 - 10	2 - 10	2 - 10	2 - 10
1,1-Dichloroethane	74.4	99.3	31.4	79.9	15.7	72.3	87	29.2	88	36.1	47.5	25.0
1,2-Dichloroethane	2.08	2.78	2.09	2.2		1.37	2.02		1.79		1.27	
1,4-Dioxane					10.5			12.2		23.3	29.0	
Acetone	3.54LC						11.8		**14.4 LC**			
Benzene												
Chloroethane	3.4		6.06	4.32		2.43	5.93		4.12	1.42	3.3	
Chloromethane		6.06										
cis-1,2-Dichloroethene	12.1	9.6	8.41	6.83	1.87	8.78	5.21	2.57	6.96	2.00	3.68	1.5
Cyclohexane	0.22	0.76										
Methylene chloride	.80LC	.38LC										
Trichloroethene												
Vinyl chloride	58.3	64.6	70.8	64.6	11.7	80	76.8	10.8	90.7	6.39	21.0	4.87
Total VOCs, µg/l	**150.5** w/ Js	**183.1** w/ Js	**118.76** w/ Js	**157.85** w/ Js	**39.77** w/ Js	**164.88** w/ Js	**188.76** w/ Js	**54.77** w/ Js	**191.57** w/ Js	**69.21** w/ Js	**105.75** w/ Js	**31.37** w/ Js

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-13	<= post extraction well rebuild =>												
Volatile Organic Compound	11/20/10	2/3/11	4/15/11	6/8/11	7/21/11	10/18/11	1/31/12	3/22/12	6/30/12	10/2/12	12/18/12	4/5/13	7/24/14
Detection limit	100	1	1	1	1	0.5 - 10	0.5 - 10	0.5 - 10	25 - 500	0.5 - 2	0.5 - 2	0.5 - 1	0.5
1,1,2-Trichloroethane										1.94			
1,1-Dichloroethane			4	0.2			0.19		0.22	0.29	0.23	0.19	0.2
1,2,4-Trimethylbenzene			0.4	0.6	4.5	16.2		1.4	0.48	0.18		1.18	0.13
1,3,5-Trimethylbenzene	5.3	1.7	0.5	0.6	5.6	13.2		1.56	0.33	0.61	0.22	0.17	
(p) 4-Isopropyltoluene					0.4	0.59		0.58					
Acetone							1.85L		4.57L				
Benzene		1.1		0.3		0.3				0.22			
Carbon disulfide						0.89			1.58				
Chloromethane		2.6											
cis-1,2-Dichloroethene													
Cyclohexane						34.50	0.13	2.6	0.89	2.31	0.37	0.27	0.15
Ethylbenzene					0.6	2.61						0.17	
Isopropylbenzene				0.6	0.6	1.70						0.48	
Methylcyclohexane													
Methylene chloride								1.5	0.27L	.2L			
Naphthalene					1.2	1.64							
n-Propylbenzene				0.5	0.7	2.39						0.64	
sec-Butylbenzene				0.5	0.3	0.66						0.3	
Styrene					0.4	0.57							
Tetrachloroethene					0.2								
Toluene					0.3	0.48							
m,p-Xylene					1.0	7.6		1.34	0.58			0.37	
o-Xylene					0.5	2.6		1.42	0.11	0.22	0.1		
Total VOCs, µg/l	**5.3**	**5.4**	**4.9**	**3.3**	**16.3**	**85.92**	**0.32**	**10.4**	**4.19**	**5.77**	**0.92**	**3.77**	**0.48**
	w/ Js		w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-13	<= post extraction well rebuild =>												
Volatile Organic Compound	12/4/14	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	0.5	.50 - 5	.50 - 10	.50 - 10	2 - 20	2 - 20	2 - 20	2 - 20	2 - 20	2 - 20	2 - 20	2 - 20	2 - 20
1,1,2-Trichloroethane													
1,1-Dichloroethane	0.16	0.16	0.23	0.1									
1,2,4-Trimethylbenzene													
1,3,5-Trimethylbenzene													
(p) 4-Isopropyltoluene													
Acetone				1.27L				5.42 L		**25.1 L**			
Benzene													
Carbon disulfide													
Chloromethane													
cis-1,2-Dichloroethene			0.6										
Cyclohexane	0.35												
Ethylbenzene													
Isopropylbenzene													
Methylcyclohexane								1.61					
Methylene chloride													
Naphthalene													
n-Propylbenzene													
sec-Butylbenzene													
Styrene													
Tetrachloroethene													
Toluene													
m,p-Xylene													
o-Xylene													
Total VOCs, µg/l	**0.51** w/ Js	**0.16** w/ Js	**0.83** w/ Js	**0.1** w/ Js	**nd**	**nd**	**nd**	**1.61** w/ Js	**nd**	**nd**	**nd**	**nd**	**nd**

italic = found in tank contents
underlined = found in soil

CMS REMEDIATION SITE MW-14	<= post extraction well modifications =>											
Volatile Organic Compound	4/15/11	6/8/11	7/21/11	10/18/11	1/31/12	3/22/12	6/24/12	10/2/12	12/18/12	4/5/13	7/24/14	12/4/14
Detection limit	*100*	*1000*	*500*	*100-2000*	*50-1000*	*100-2000*	*100-2000*	*50 - 200*		*25 - 50*	*0.5 - 5.0*	*25 - 50*
1,1,1-Trichloroethane	1700	2100	540	1970	3390	4190	3380	5660	1920	1860	15.7	3500
1,1,2-Trichloro-1,2,2-trifluoroethane				644	2580		618	2030	725	1330	12.5	1220
1,1-Dichloroethane	3400	1400	1300	2390	1970	3100	2610	3900	2010	1650	23.8	2670
1,1-Dichloroethene	50			62	74	170	66	119	46	55.5	0.72	59
1,2,4-Trimethylbenzene				32				17		33.5	0.85	
1,3,5-Trimethylbenzene	50									11.5	0.26	5.5
Acetone				1040			530					
Benzene	30			38	16		20	19	10	15	0.64	26.5
Carbon disulfide							234					
Chloroethane												36
Chloroform		500										
cis-1,2-Dichloroethene	40			60	114	206	134	236	75	81	0.89	134
Cyclohexane				90	71	56	56	105	29	91.5	2.54	118
Ethylbenzene	40									7.5	0.28	8.5
Methylcyclohexane												
Methylene chloride		500	1800			146	176LC	53LC	43LC	11		
Tetrachloroethene				30			114	375	82	61.5	0.95	132
Toluene	40			68	31	54	32	29	20	21	0.36	21
Trichloroethene								22		5.5	0.18	17
Vinyl chloride					33							35.5
m,p-Xylene				52	29			25		35.5	0.53	11
m-Xylene	30											
o-Xylene				22				11		13	0.5	11.5
Total VOCs, µg/l	**5380**	**4500**	**3640**	**6498**	**8308**	**7922**	**7794**	**12548**	**4955**	**5308**	**60.7**	**8005.5**
	w/ J	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js

italic = found in tank contents
underlined = found in soil

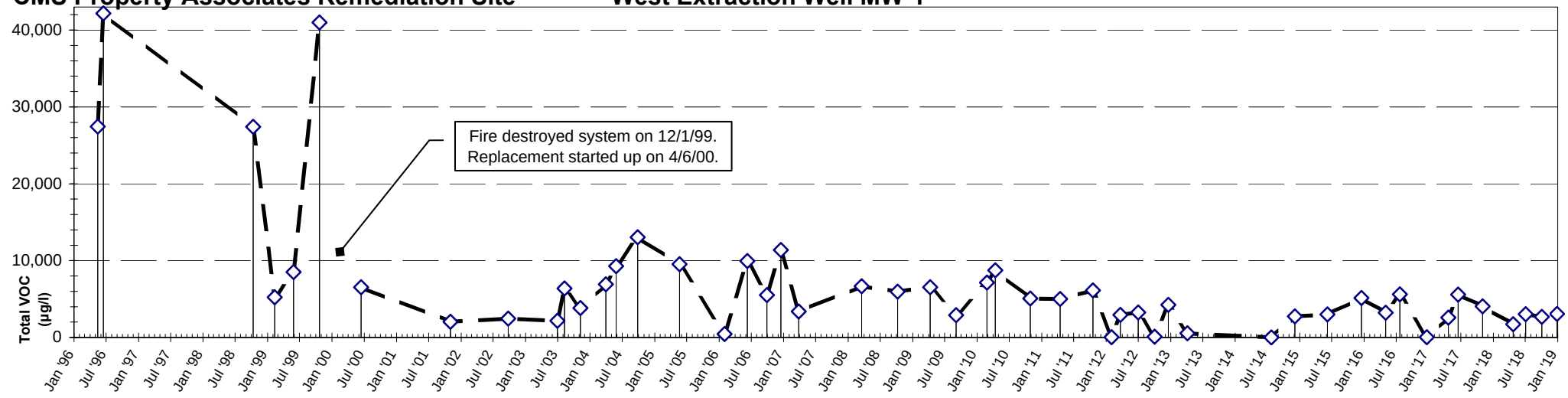
CMS REMEDIATION SITE MW-14	<= post extraction well modifications =>											
Volatile Organic Compound	6/7/15	12/17/15	5/2/16	7/21/16	12/21/16	4/21/17	6/16/17	11/2/17	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	*50-1000*	*50-1000*	*50-1000*	*100-1000*	*100 - 250*	*20 - 200*	*20 - 200*	*20 - 200*	50 - 125	50 - 250	50 - 250	50 - 250
1,1,1-Trichloroethane	3840	1790	4400	1830	1010	1040	1690	1600	2030	1500	1380	1160
1,1,2-Trichloro-1,2,2-trifluoroethane			1540			470	439	512	1650	1070	917	820
1,1-Dichloroethane	3570	2340	2640	1880	2530	1120	2610	2680	4910	3280	3950	2250
1,1-Dichloroethene	89	34	62			19.7	42.4	42.2	151	62.9	69.2	25.7
1,2,4-Trimethylbenzene												
1,3,5-Trimethylbenzene												
Acetone	110L		275L									
Benzene	12				38.3	8.74	14	19.9	17.4	21.4	28.4	
Carbon disulfide												
Chloroethane					84.1	10		53.8		46.7	43.5	29.2
Chloroform												
cis-1,2-Dichloroethene		99	113			51	57	91.3	52.9	58.5	86.4	50.8
Cyclohexane	31	44										
Ethylbenzene												
Methylcyclohexane					88.5	25		47.6	43.9	55.3	62.1	
Methylene chloride	68.0L	26.0L										
Tetrachloroethene	82	17	60			13.4			29.9	40.3		
Toluene	10	13									35.4	
Trichloroethene	76	56	121			40	50	51.6	32.2		27.6	30.6
Vinyl chloride			33		50			44		34.0	60.7	**41.5**
m,p-Xylene												
m-Xylene												
o-Xylene		41										
Total VOCs, µg/l	**7710**	**4704**	**8969**	**3710**	**3800.9**	**2797.84**	**4902.4**	**5142.4**	**8917.3**	**6169.1**	**6660.3**	**4407.8**
	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js
italic = found in tank contents												
underlined = found in soil												

CMS REMEDIATION SITE MW-15	<= post extraction well rebuild =>									
Volatile Organic Compound	5/2/2016	7/21/2016	12/21/2016	4/21/2017	6/16/2017	11/2/2017	4/24/18	7/3/18	10/3/18	12/28/18
Detection limit	*25 - 500*	*10 - 100*	*10 - 100*	*10 - 100*	*10 - 100*	*10 - 100*	2 - 50	10 - 50	5 - 25	4 - 20
1,1,1-Trichloroethane		103	84.3	88.1	46.3	40.1	16.7	11.5	35.4	26.2
1,1,2-Trichloro-1,2,2-trifluoroethane	27.5	10.6	15.3	39.4	21.6	8.09	20.6	17.4	18.3	18.2
1,1-Dichloroethane	798	535	707	612	445	484	408	316	376	326
1,1-Dichloroethene										
1,2,4-Trimethylbenzene			21.7		6.04					
Acetone					30.9					
Benzene		6.06	12.8	2.84	4.8		3.55	10.3	3.85	4.41
Chloroethane				8.78	47.3		24.2	76.4	31.8	78.6
cis-1,2-Dichloroethene	12.5	6.66	7.1	6.31		5.83			4.17	3.67
Cyclohexane			58.9		63.9					12.2
Methylcyclohexane		9.15	64.6	5.89	104		13.6	8.2	3.79	4.24
Toluene			9.5							
m,p-Xylene			5.94							
o-Xylene			12.2							
Total VOCs	**838**	**670.47**	**999.34**	**763.32**	**769.84**	**538.02**	**486.65**	**439.8**	**473.31**	**473.52**
	w/ Js		w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js	w/ Js
italic = found in tank contents										
underlined = found in soil										

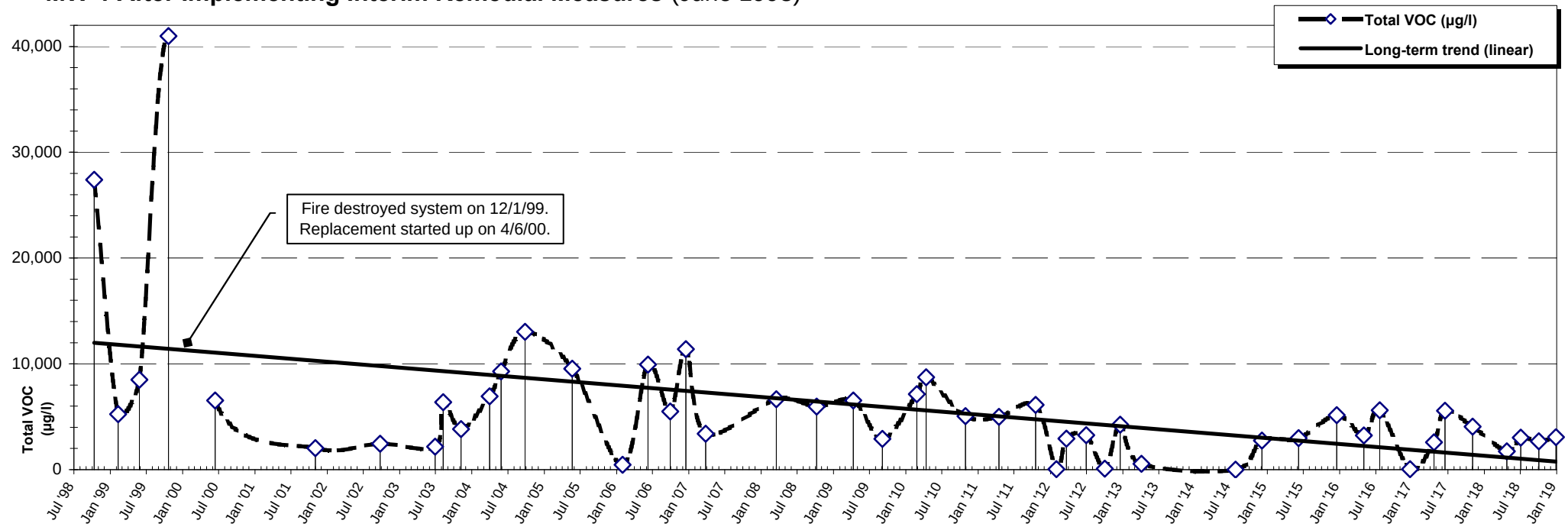
APPENDIX B

Graphical Presentation of Groundwater Quality Monitoring through December 2018

CMS Property Associates Remediation Site West Extraction Well MW-1



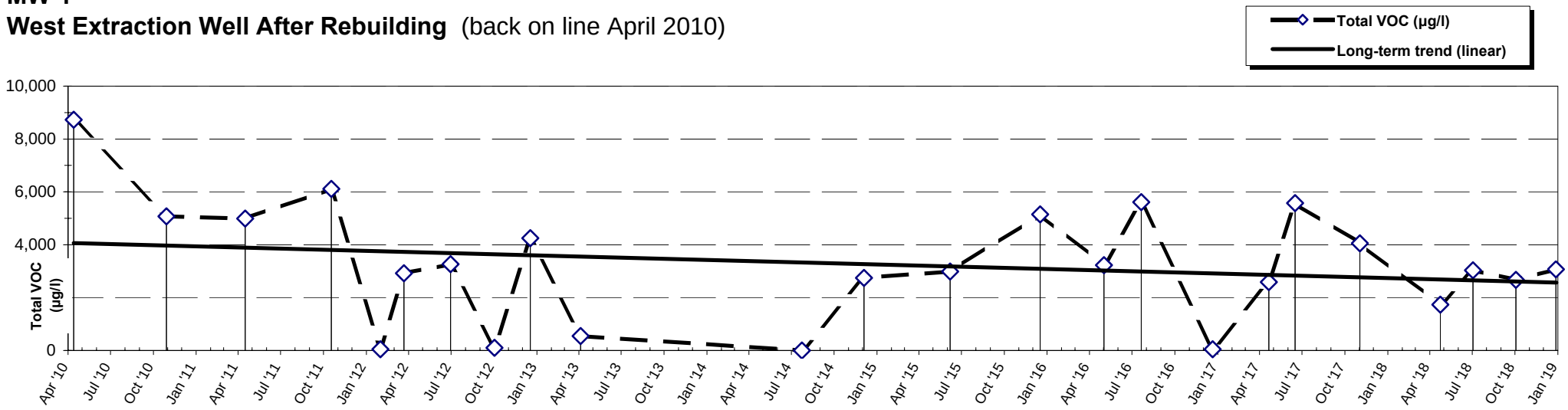
MW-1 After Implementing Interim Remedial Measures (June 1998)



Date	Oct '08	Apr '09	Sep '09	Feb '10	Apr '10	Oct '10	Apr '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	5,970	6,540	2,910	7,140	8,730	5,070	4,990	6,118	43	2,927	3,262	101	4,245	543	nd	2,746	2,988	nd	3,226	5,615	45	2,587	5,577	4,055	1,733	3,031	2,669	3,067

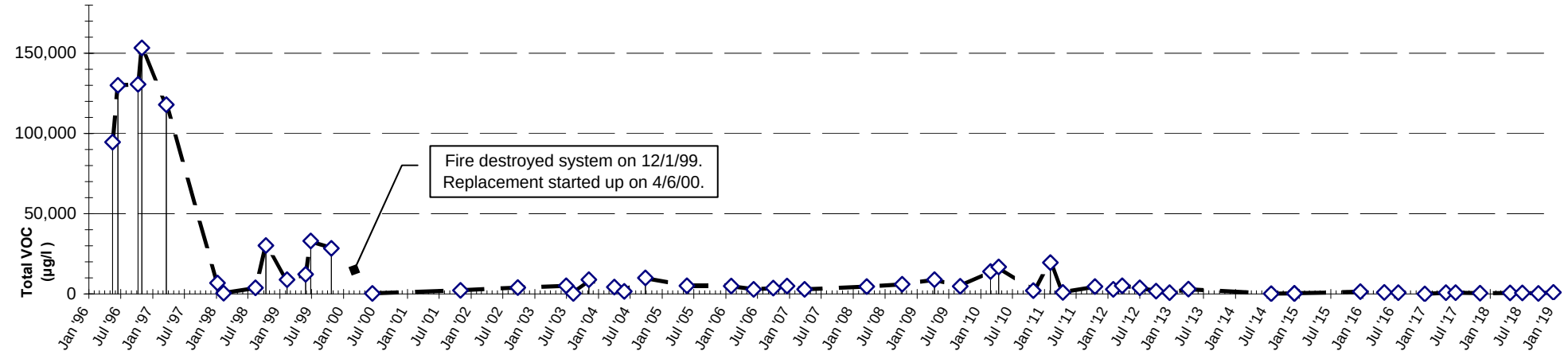
MW-1

West Extraction Well After Rebuilding (back on line April 2010)

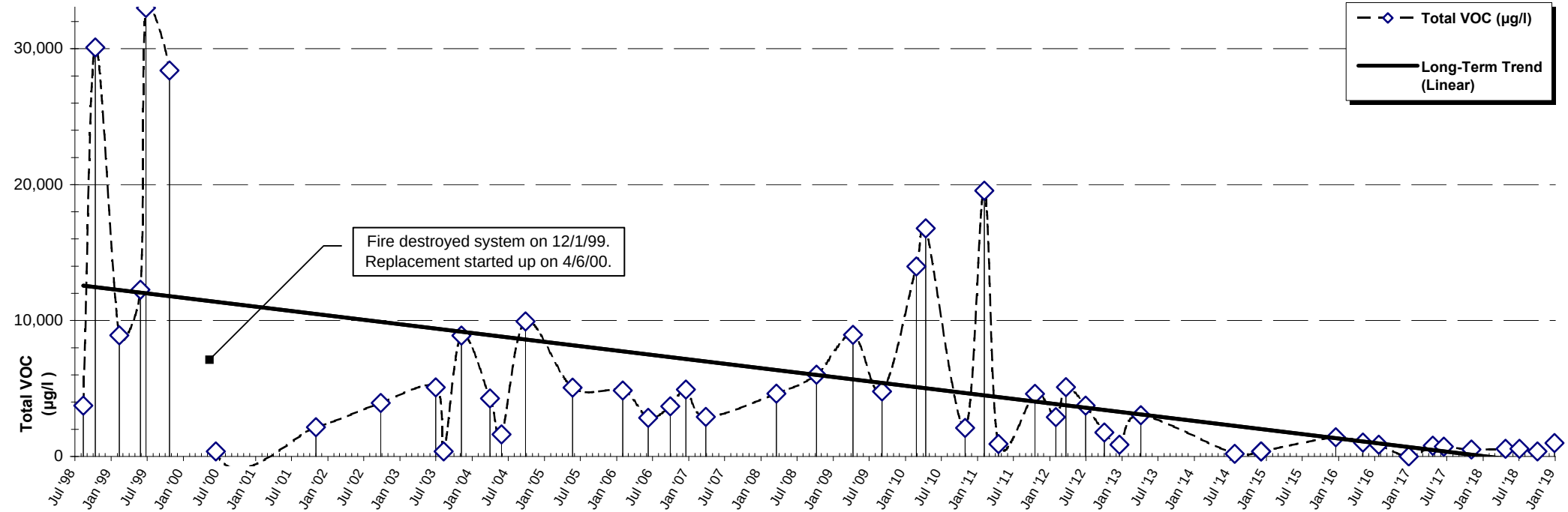


Date	Apr '10	Oct '10	Apr '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	8,730	5,070	4,990	6,118	43	2,927	3,262	101	4,245	543	nd	2,746	2,988	5,146	3,226	5,615	45	2,587	5,577	4,055	1,733	3,031	2,669	3,067

CMS Associates Remediation Site — South Extraction Well MW-2



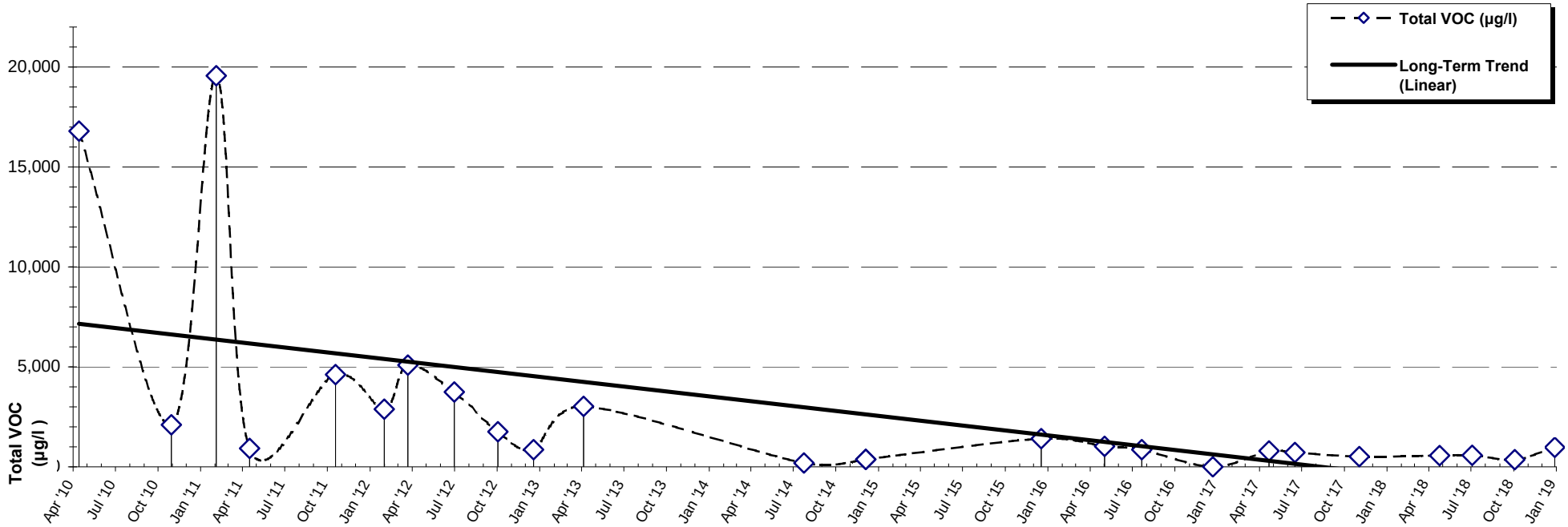
MW-2 After Implementing Interim Remedial Measures (June 1998)



Date	Aug '98	Oct '98	Feb '99	May '99	Jun '99	Oct '99	Jun '00	Nov '01	Sep '02	Jun '03	Aug '03	Nov '03	Mar '04	May '04	Sep '04	May '05	Jan '06	Jun '06	Sep '06	Dec '06	Mar '07	Mar '08	Oct '08	Apr '09	Sep '09	Feb '10	Apr '10			
TVOCs	3,740	30,100	8,920	12,270	33,000	28,400	379	2,152	3,943	5,081	375	8,900	4,280	1,624	9,940	5,060	4,860	2,836	3,681	4,920	2,913	4,630	6,020	8,940	4,780	13,970	16,790			

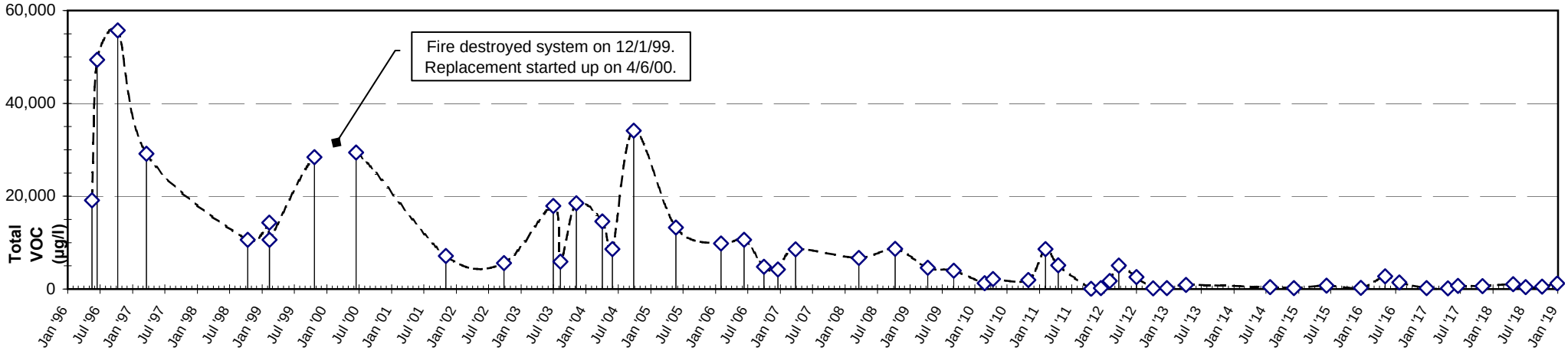
MW-2

South Extraction Well After Rebuilding (back on line April 2010)

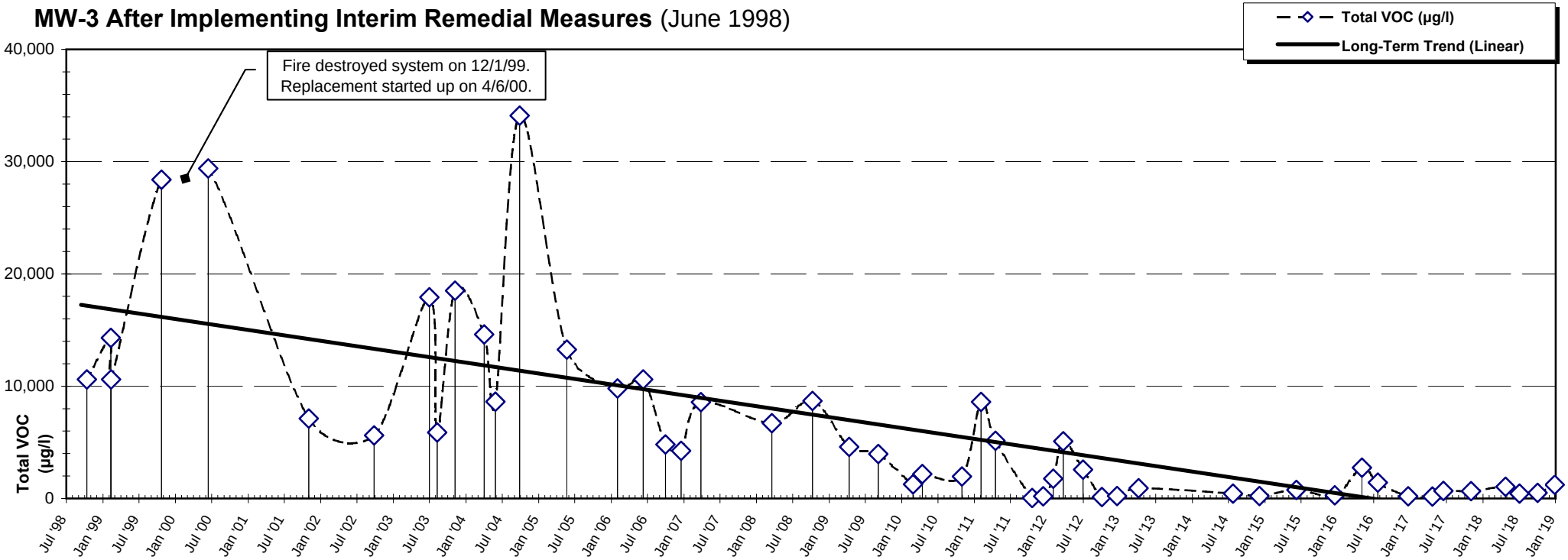


Date	Apr '10	Oct '10	Feb '11	Apr '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Dec '14	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	16790	2108	19560	920	4615	2886	5096	3742	1758	865	3032	186	376	376	1415	1031	863	nd	792	721	518	569	573	364	980

CMS Property Associates Remediation Site Center Extraction Well MW-3



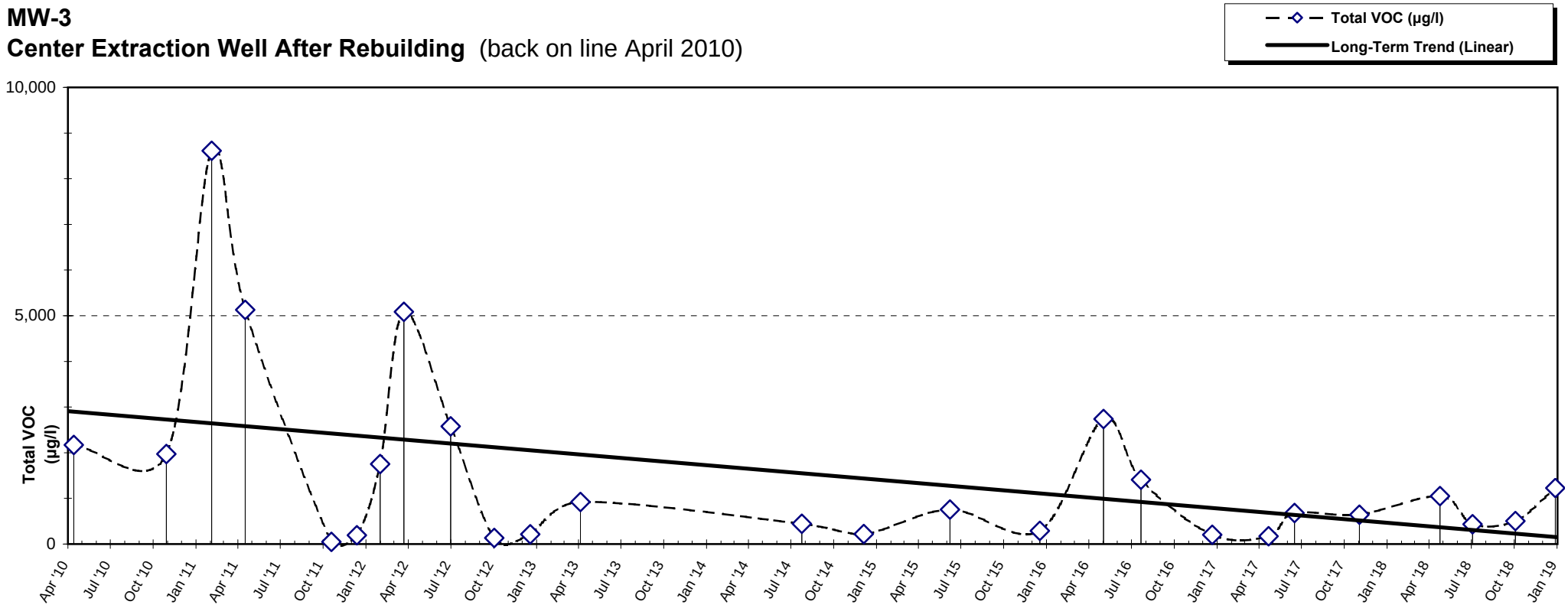
MW-3 After Implementing Interim Remedial Measures (June 1998)



Date	Oct '98	Feb '99	Feb '99	Oct '99	Jun '00	Nov '01	Sep '02	Jun '03	Aug '03	Nov '03	Apr '04	May '04	Sep '04	May '05	Jan '06	Jun '06	Sep '06	Dec '06	Mar '07	Mar '08	Oct '08	Apr '09	Sep '09	Feb '10	Apr '10	Oct '10	Feb '11
TVOCs	10,600	14,300	10,600	28,400	29,400	7,114	5,621	17,918	5,890	18,500	14,600	8,630	34,100	13,250	9,800	10,600	4,810	4,240	8,580	6,700	8,680	4,600	3,960	1,268	2,170	1,970	8,610

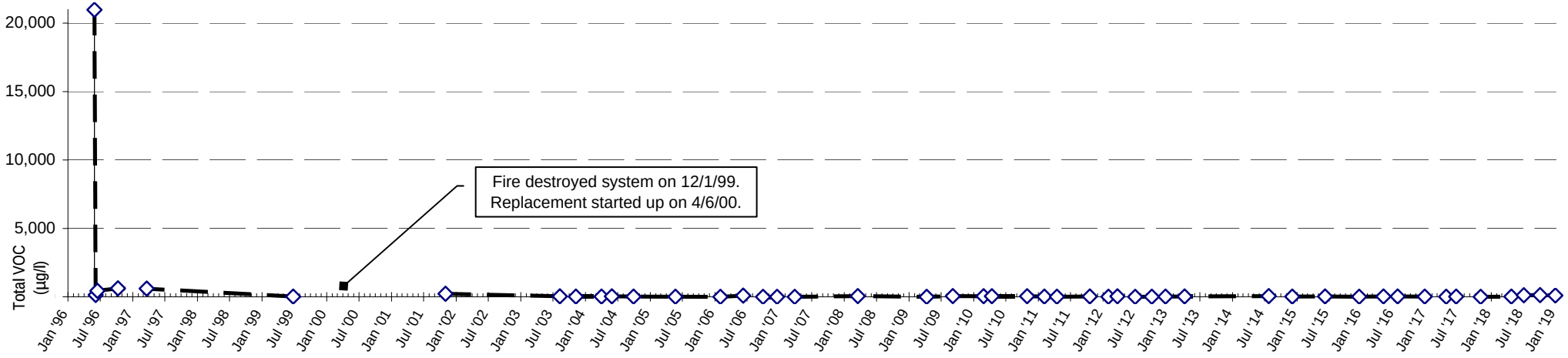
MW-3

Center Extraction Well After Rebuilding (back on line April 2010)

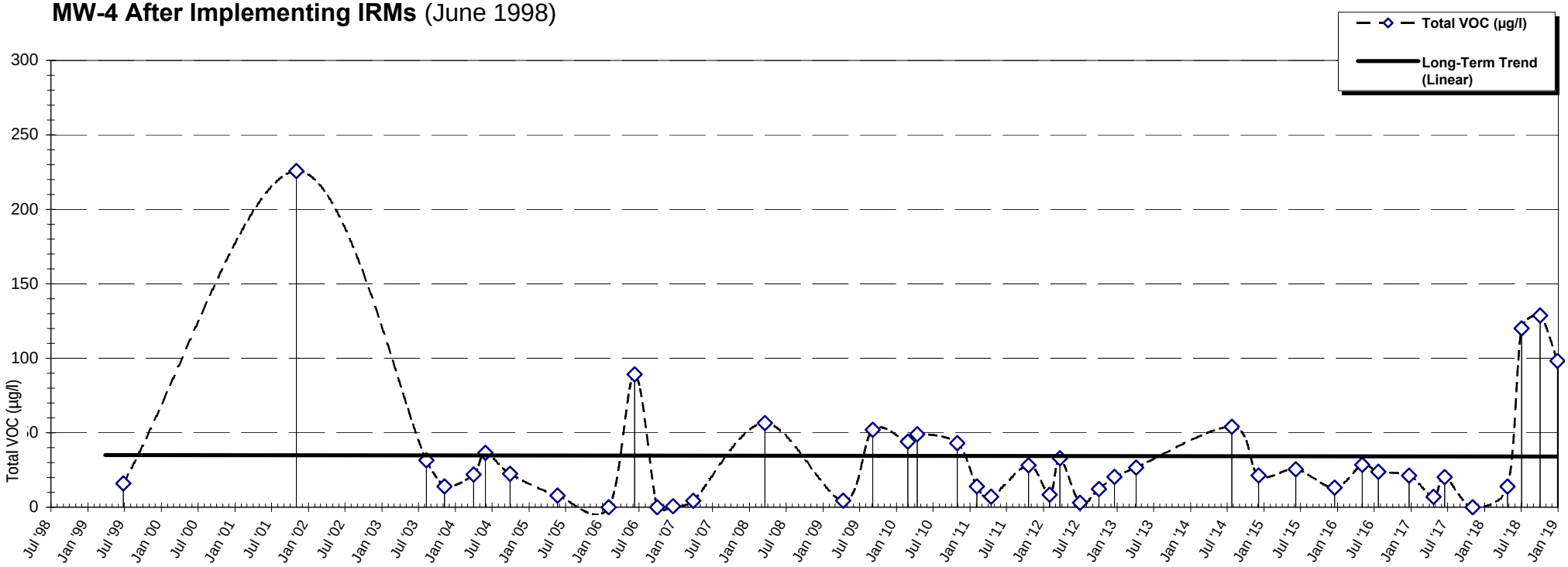


Date	Apr '10	Oct '10	Feb '11	Apr '11	Oct '11	Dec '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	2,170	1,970	8,610	5,130	46	193	1,753	5,088	2,577	133	214	922	445	220	755	289	2,738	1,408	204	169	682	644	1,051	436	505	1,227

CMS Associates Remediation Site — West Perimeter Monitoring Well MW-4



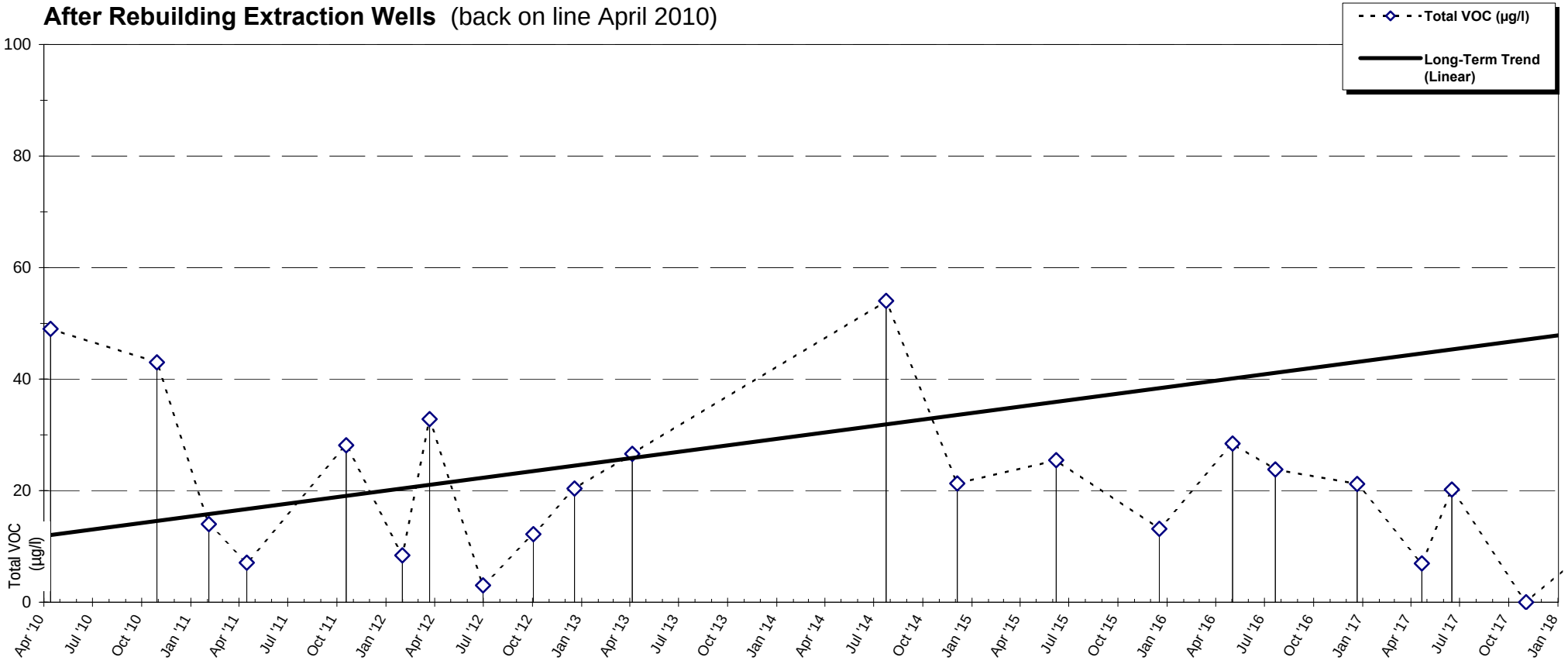
MW-4 After Implementing IRMs (June 1998)



Date	Jun '99	Nov '01	Aug '03	Nov '03	Mar '04	May '04	Sep '04	May '05	Jan '06	Jun '06	Sep '06	Dec '06	Mar '07	Mar '08	Apr '09	Sep '09	Feb '10	Apr '10									
TVOCs	16	226	32	14	22	37	23	8	nd	89	nd	1	4	57	4	52	44	49									

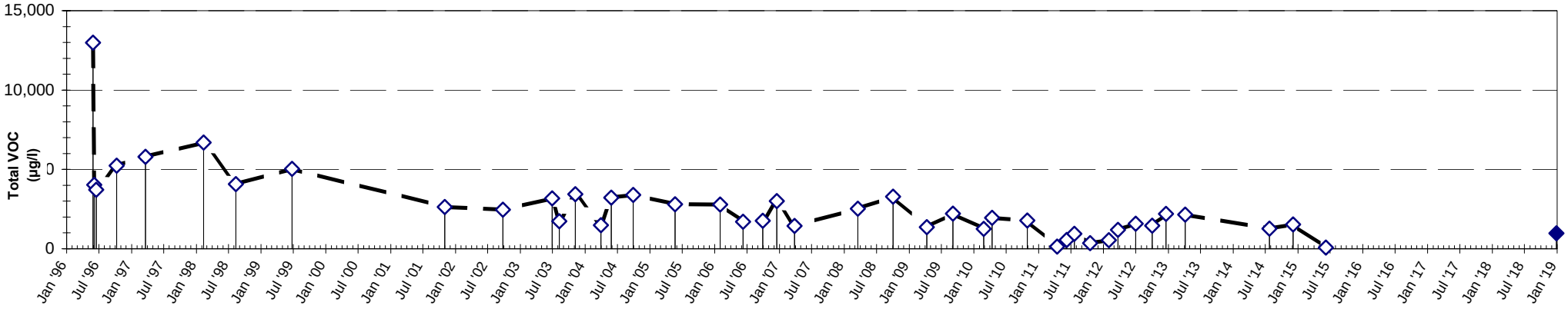
West Perimeter Monitoring Well MW-4

After Rebuilding Extraction Wells (back on line April 2010)

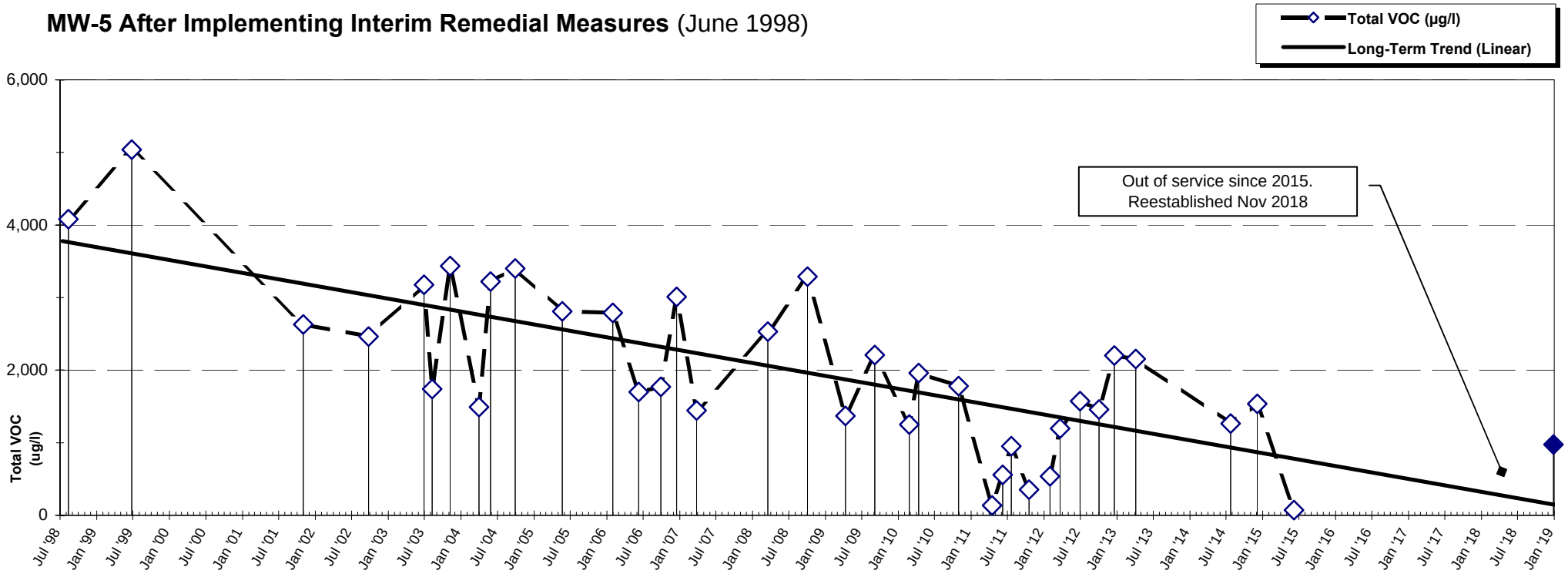


Date	Apr '10	Oct '10	Feb '11	Apr '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	49	43	14	7	28	8	33	3	12	20	27	54	21	25	13	28	24	21	7	20	nd	14	120	129	98

CMS Associates Remediation Site **Northwest Perimeter Monitoring Well MW-5**

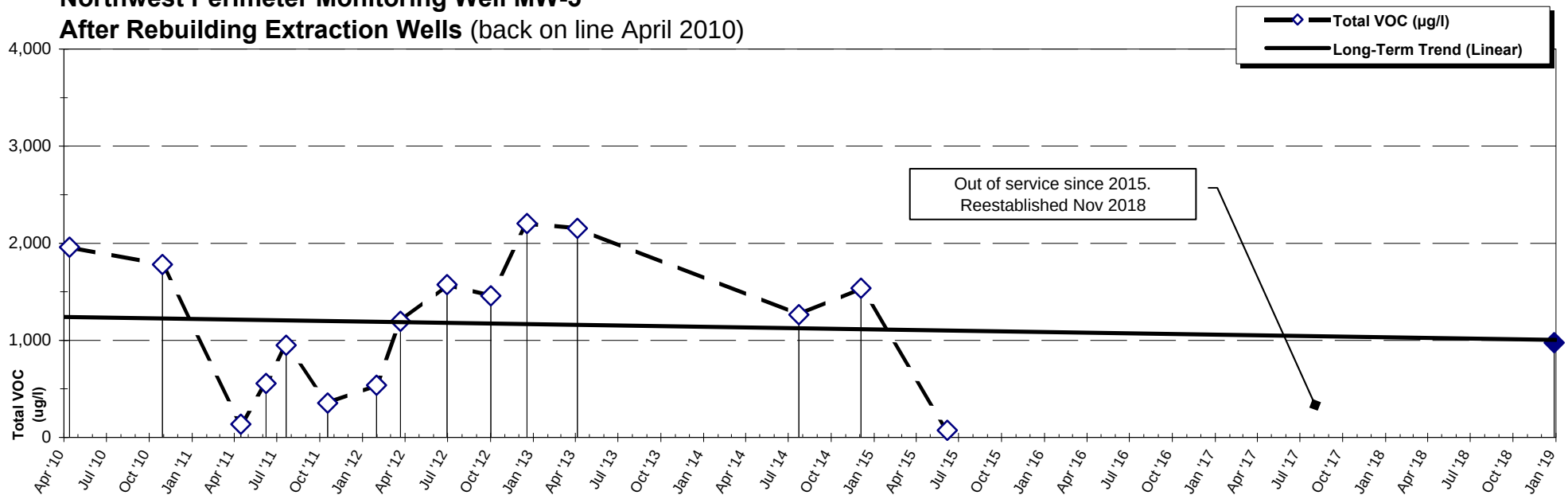


MW-5 After Implementing Interim Remedial Measures (June 1998)



Date	May '05	Jan '06	Jun '06	Sep '06	Dec '06	Mar '07	Mar '08	Oct '08	Apr '09	Sep '09	Feb '10	Apr '10	Oct '10	Apr '11	Jun '11	Jul '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15		Dec '18
TVOCs	2,810	2,790	1,700	1,770	3,010	1,443	2,530	3,290	1,370	2,210	1,250	1,960	1,780	136	556	950	355	537	1,196	1,573	1,458	2,202	2,154	1,265	1,537	73		975

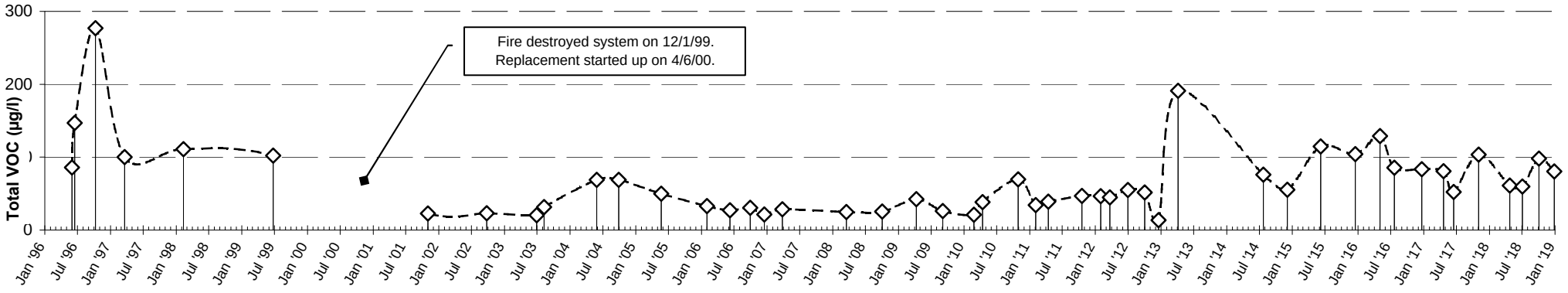
Northwest Perimeter Monitoring Well MW-5
After Rebuilding Extraction Wells (back on line April 2010)



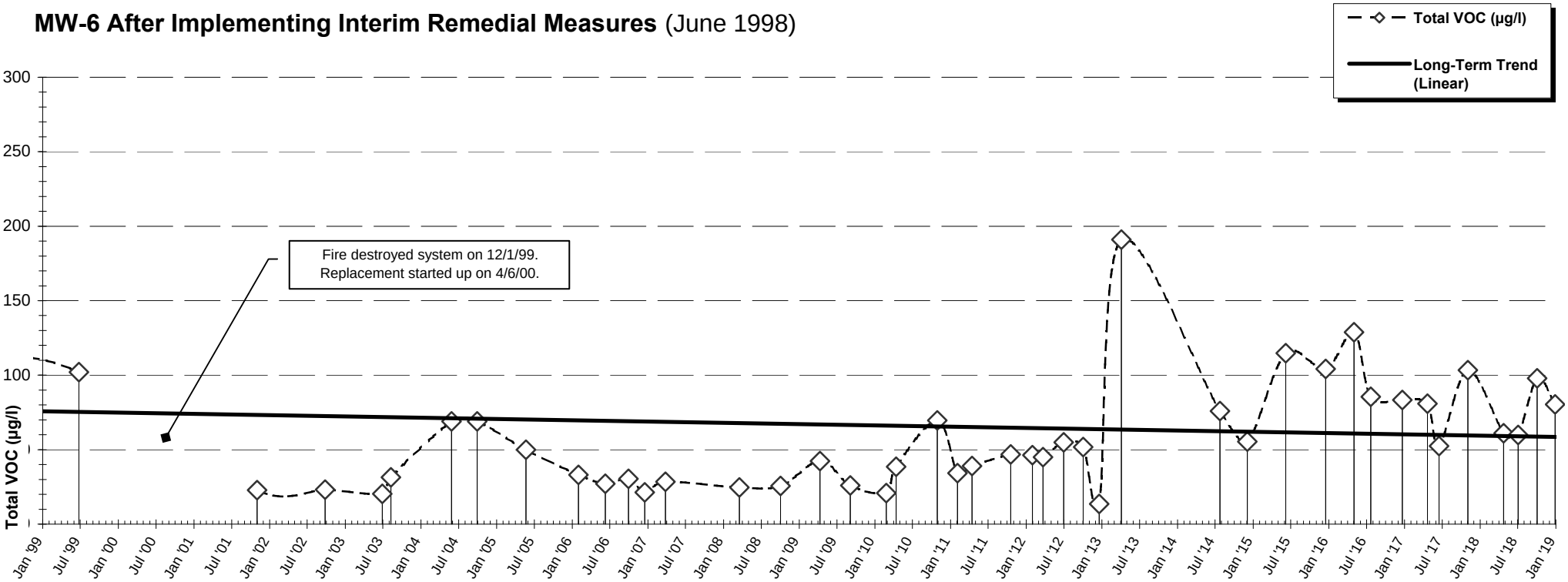
Date	Apr '10	Oct '10	Apr '11	Jun '11	Jul '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15
TVOCs	1,960	1,780	136	556	950	355	537	1,196	1,573	1,458	2,202	2,154	1,265	1,537	73

Dec '18
975

CMS Property Associates Remediation Site **North Perimeter Monitoring Well MW-6**

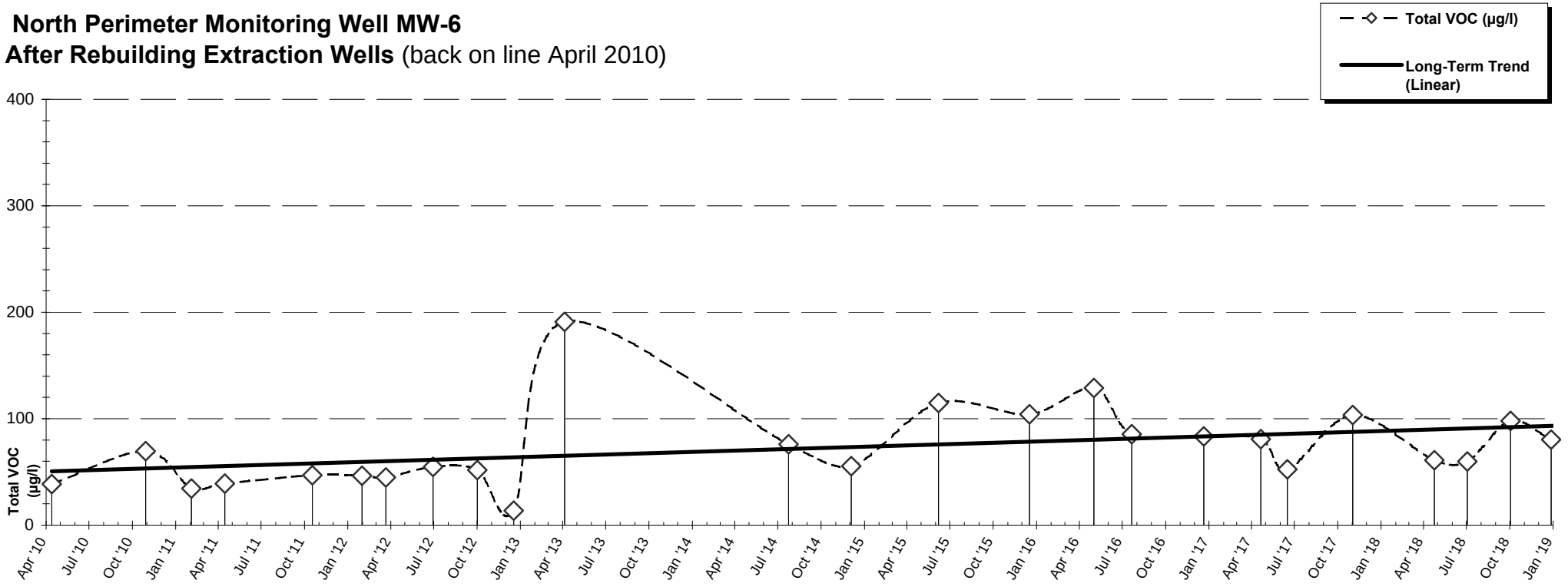


MW-6 After Implementing Interim Remedial Measures (June 1998)



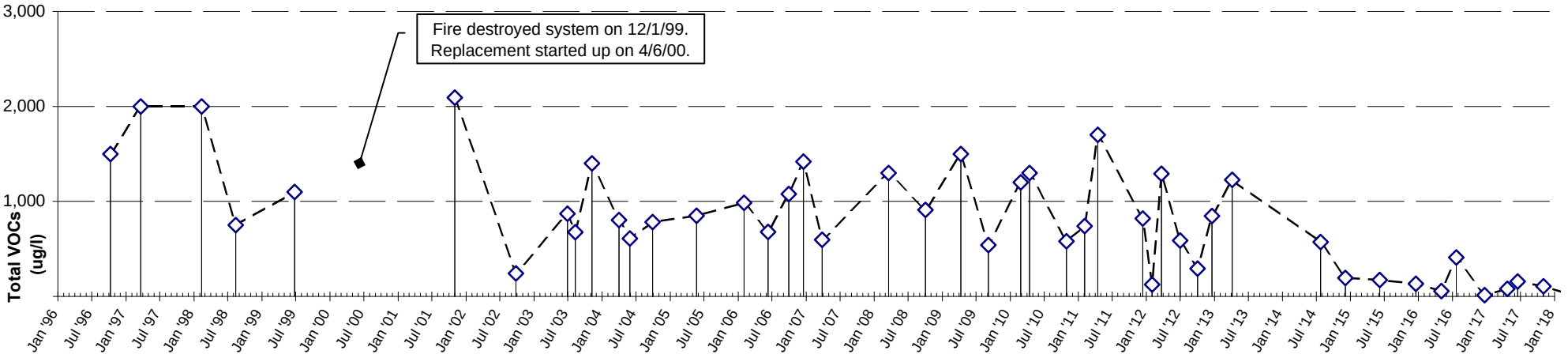
Date	Jun '99	Feb '98	Jun '99	Nov '01	Sep '02	Jun '03	Aug '03	May '04	Sep '04	May '05	Jan '06	Jun '06	Sep '06	Dec '06	Mar '07	Mar '08	Oct '08	Apr '09	Sep '09	Feb '10	Apr '10	Oct '10	Feb '11	Apr '11	Oct '11	Jan '12	Mar '12
TVOCs	102	111	102	23	23	20	31	69	69	50	33	27	30	21	28	25	26	42	26	21	39	70	34	39	47	46	45

North Perimeter Monitoring Well MW-6
After Rebuilding Extraction Wells (back on line April 2010)

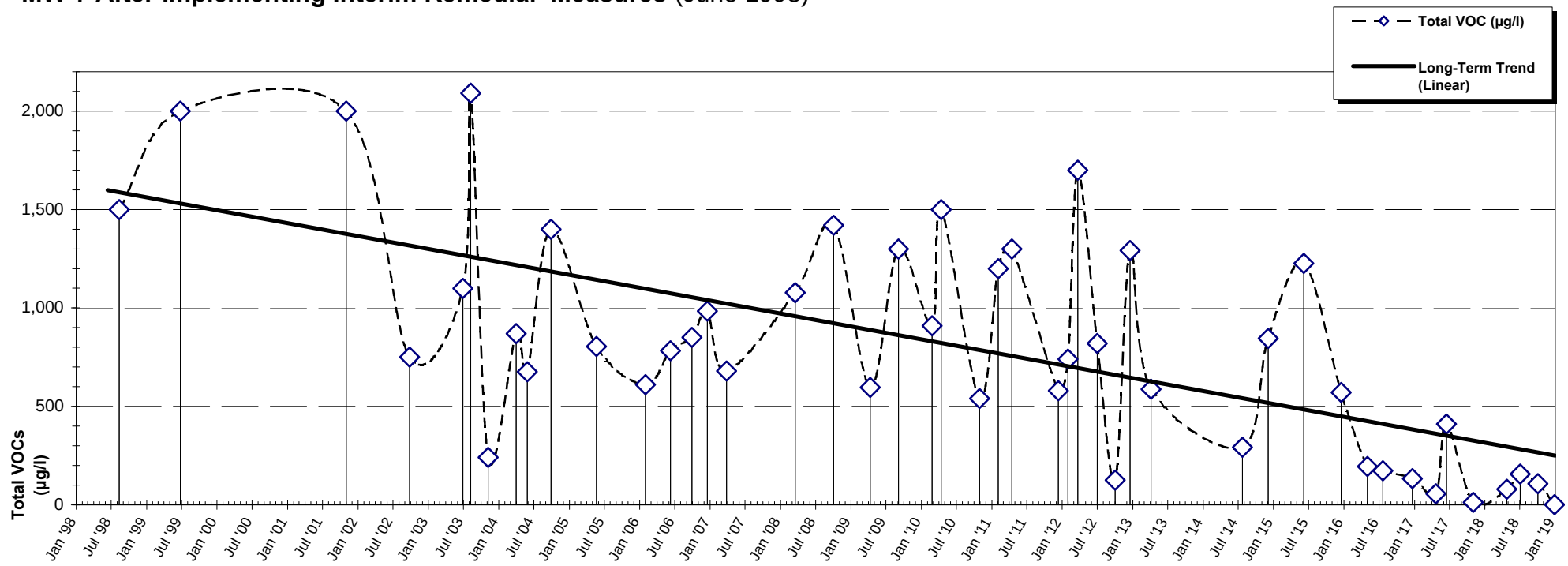


Date	Apr '09	Sep '09	Feb '10	Apr '10	Oct '10	Feb '11	Apr '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	42	26	21	39	70	34	39	47	46	45	55	52	14	191	76	55	115	104	129	85	83	81	52	103	61	60	98	80

CMS Property Associates Remediation Site — East Perimeter Monitoring Well MW-7

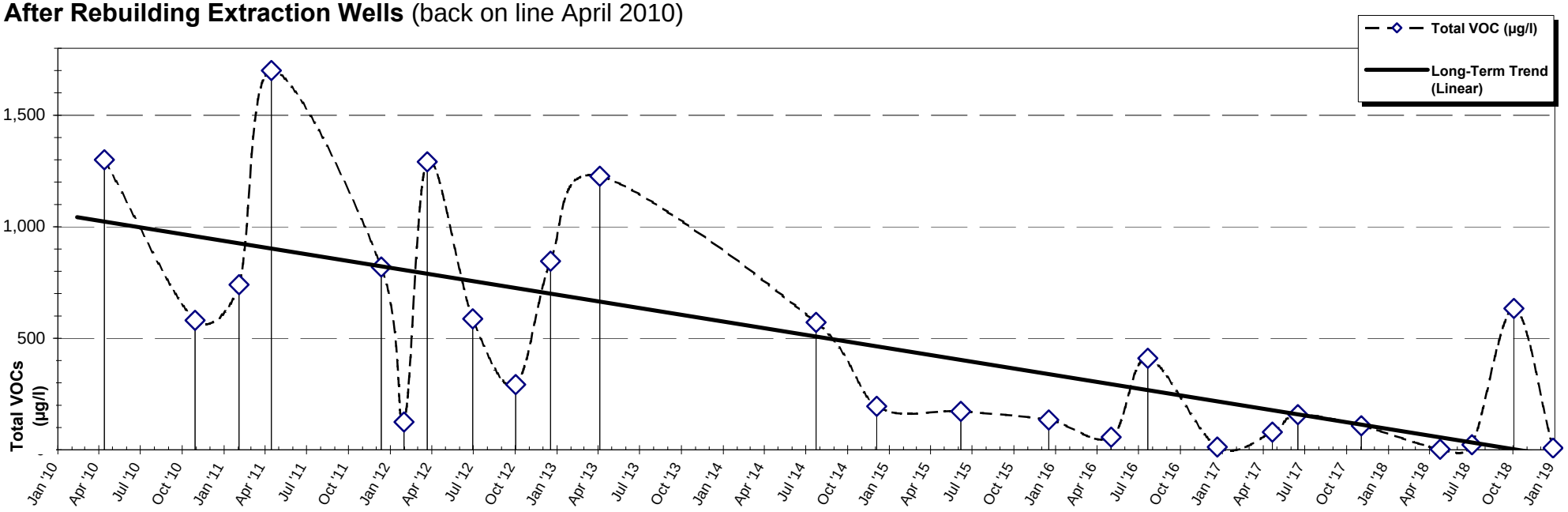


MW-7 After Implementing Interim Remedial Measures (June 1998)



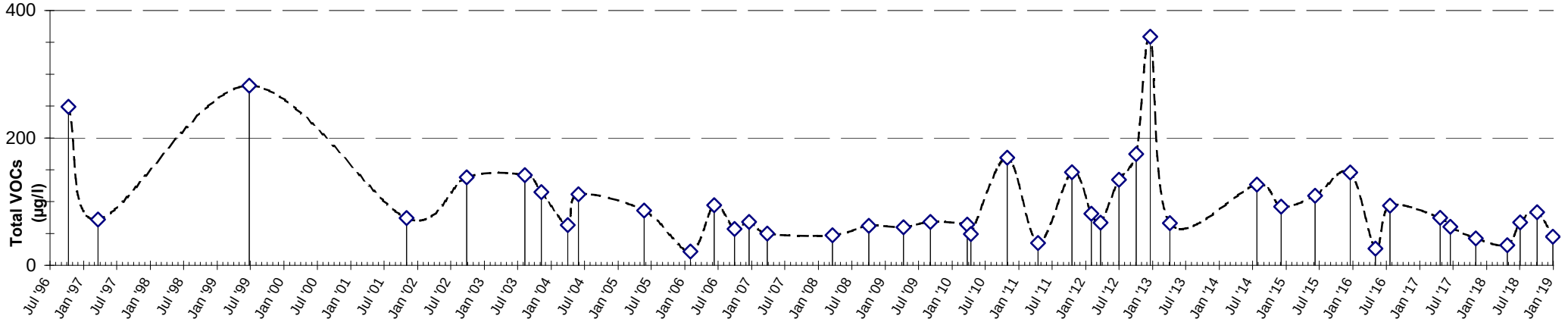
Date	Aug '98	Jun '99	Nov '01	Sep '02	Jun '03	Aug '03	Nov '03	Mar '04	May '04	Sep '04	May '05	Jan '06	Jun '06	Sep '06	Dec '06	Mar '07	Mar '08	Oct '08	Apr '09	Sep '09	Feb '10	Apr '10	Oct '10	Feb '11	Apr '11	Dec '11	Jan '12	Mar '12
TVOCs	751	1,100	2,092	241	870	676	1,400	804	610	782	850	984	680	1,078	1,420	596	1,300	910	1,500	540	1,200	1,300	580	740	1,700	820	125	1,291

East Perimeter Monitoring Well MW-7
After Rebuilding Extraction Wells (back on line April 2010)

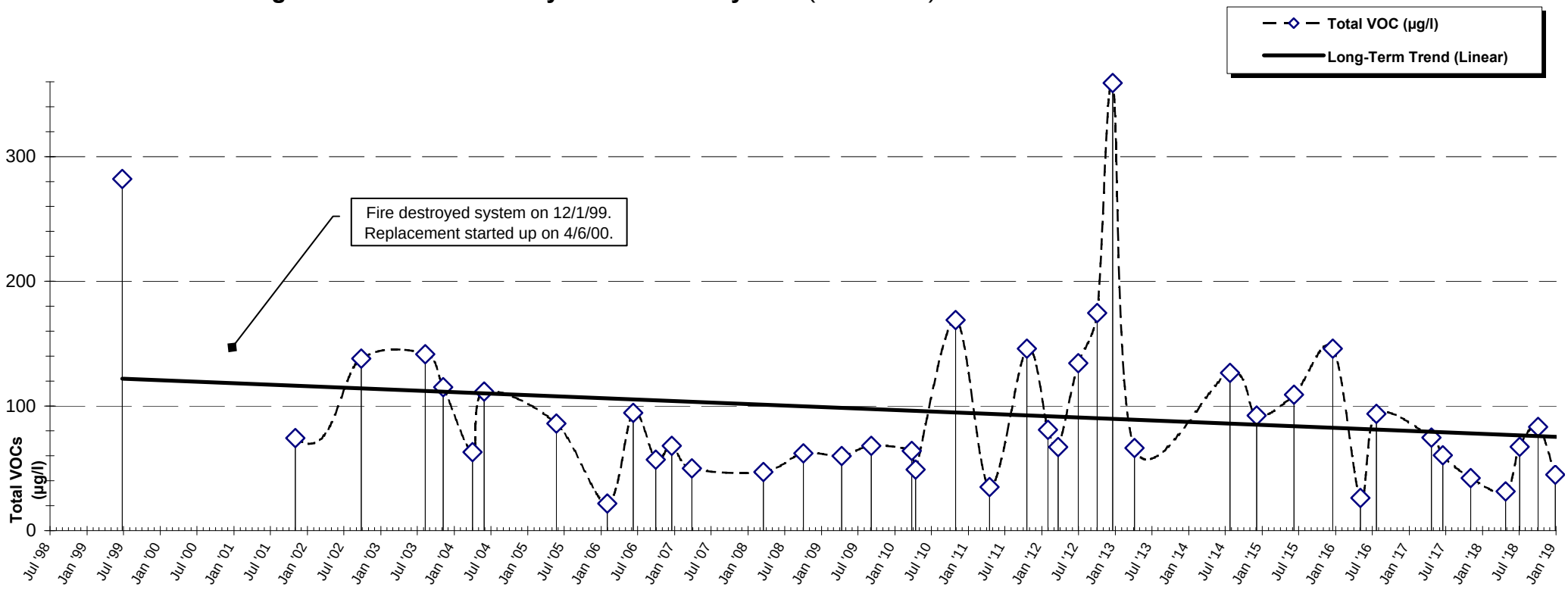


Date	Feb '10	Apr '10	Oct '10	Feb '11	Apr '11	Dec '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	1,200	1,300	580	740	1,700	820	125	1,291	587	292	846	1,226	571	196	173	133	57	410	13	79	157	107	2	23	634	8

CMS Associates Remediation Site **South-Center Perimeter Monitoring Well MW-8**

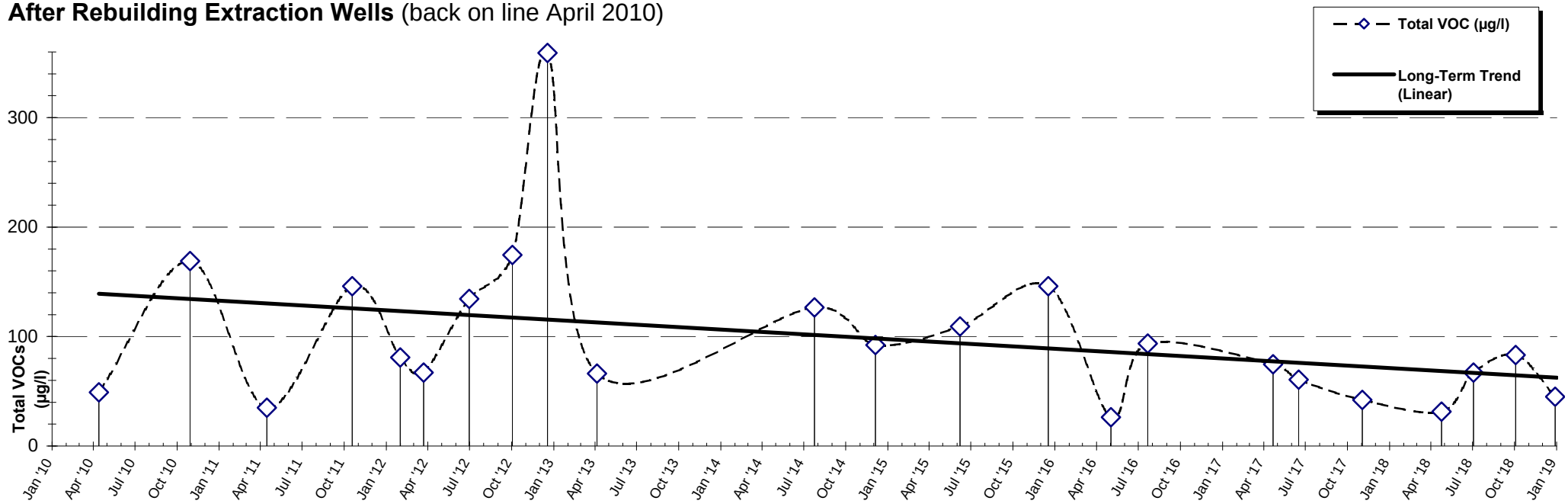


MW-8 After Installing Groundwater Recovery & Treatment System (June 1998)



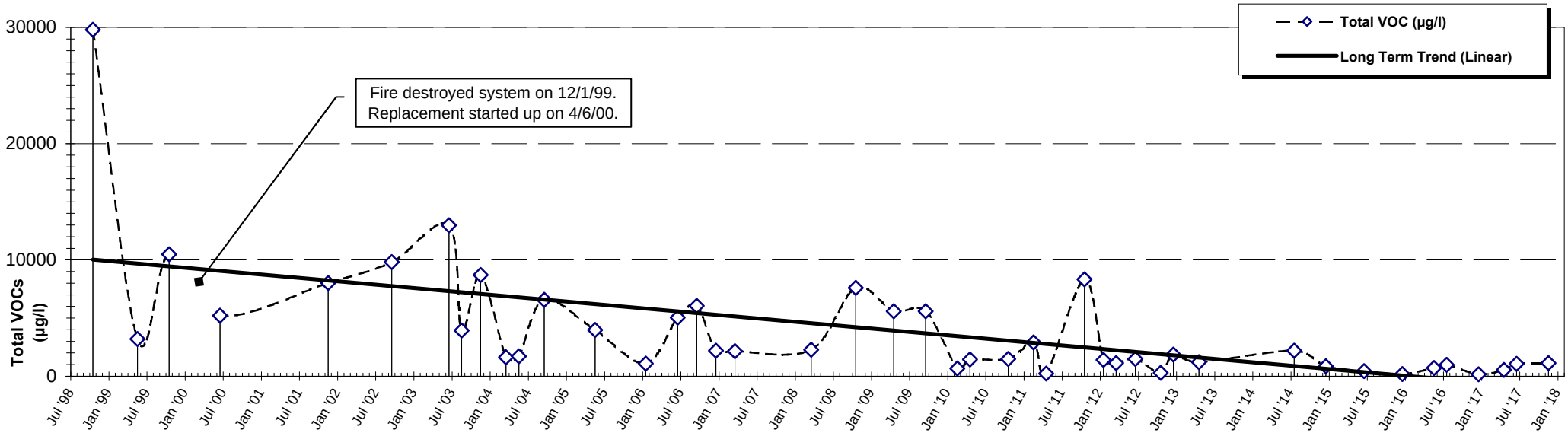
Date	Jun '99	Nov '01	Sep '02	Aug '03	Nov '03	Mar '04	May '04	May '05	Jan '06	Jun '06	Sep '06	Dec '06	Mar '07	Mar '08	Oct '08	Apr '09	Sep '09	Mar '10	Apr '10	Oct '10	Apr '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13
VOCs	282	74	138	142	115	63	112	86	22	95	57	68	50	47	62	60	68	64	49	169	35	146	81	67	134	175	359	66

South-Center Perimeter Monitoring Well MW-8
After Rebuilding Extraction Wells (back on line April 2010)



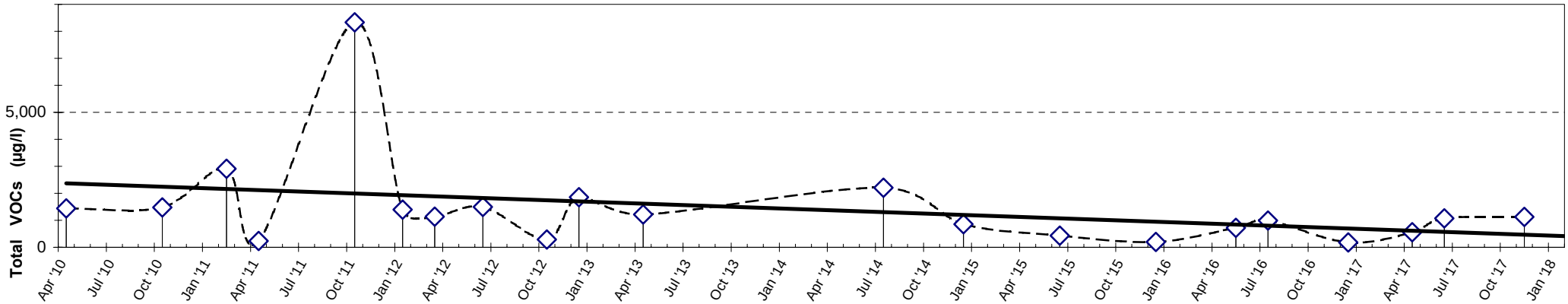
Date	Apr '10	Oct '10	Apr '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
VOCs	49	169	35	146	81	67	134	175	359	66	127	92	109	146	26	94	75	61	42	31	67	83	45

CMS Property Associates Remediation Site North Extraction Well MW-9
After Implementing Interim Remedial Measures (June 1998)



Date	Oct '98	May '99	Oct '99	Jun '00	Nov '01	Sep '02	Jun '03	Aug '03	Nov '03	Mar '04	May '04	Sep '04	May '05	Jan '06	Jun '06	Sep '06	Dec '06	Mar '07	Mar '08	Oct '08	Apr '09	Sep '09	Feb '10	Apr '10	Oct '10	Feb '11	Apr '11	Oct '11
TVOCs	29,800	3,210	10,490	5,220	8,015	9,813	12,984	3,926	8,700	1,626	1,715	6,580	3,980	1,092	5,040	6,060	2,200	2,156	2,278	7,600	5,580	5,590	670	1,437	1,480	2,910	238	8,335

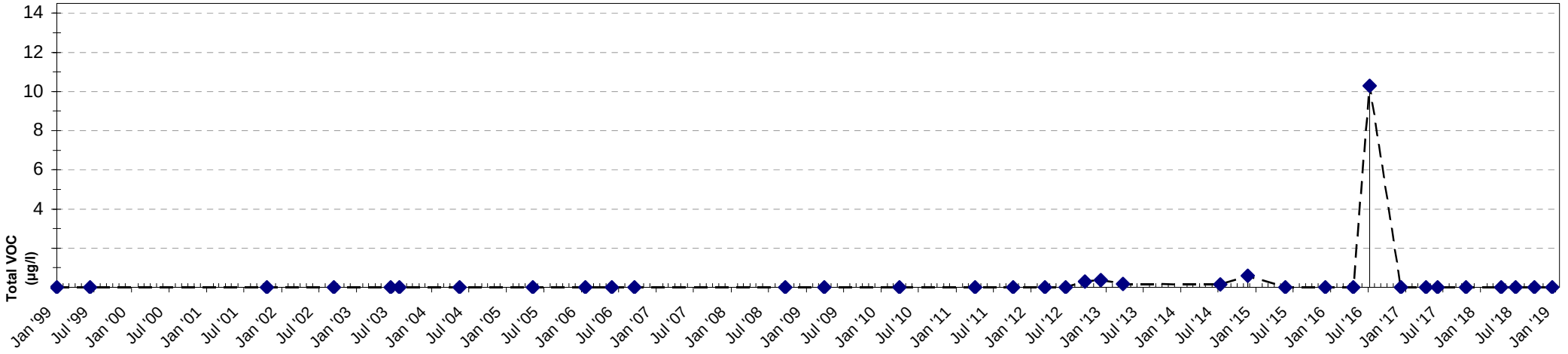
MW-9 North Extraction Well After Rebuilding (back on line April 2010)



Date	Apr '10	Oct '10	Feb '11	Apr '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	1,437	1,480	2,910	238	8,335	1,395	1,136	1,495	284	1,860	1,213	2,203	858	432	195	720	992	176	554	1,068	1,127	144	724	809	500

CMS Property Associates Remediation Site **Northeast Off-site Monitoring Well MW-10**

After Implementing Interim Remedial Measures (June 1998)

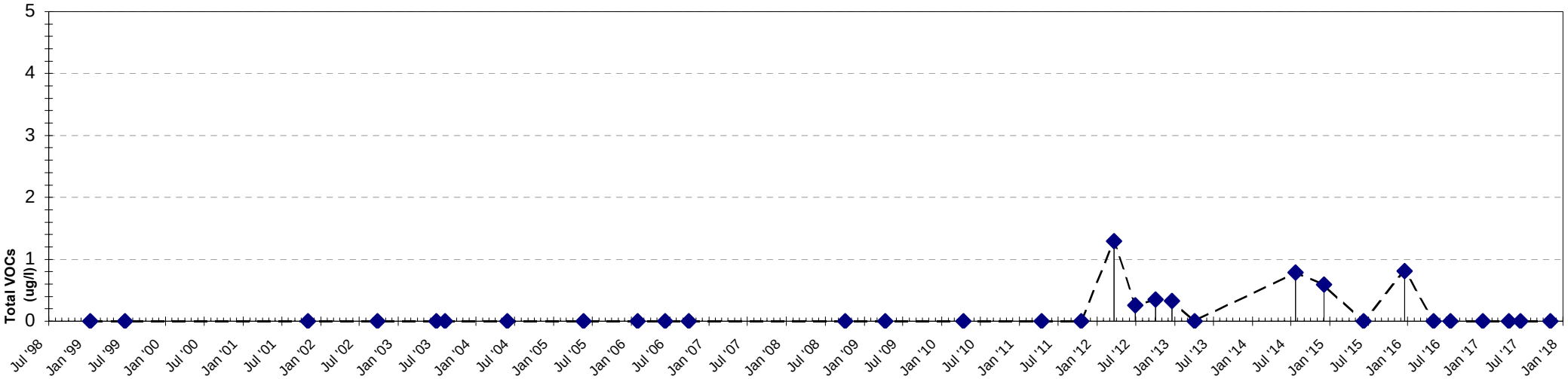


Date	May '05	Jan '06	Jun '06	Sep '06	Oct '08	Apr '09	Apr '10	Apr '11	Oct '11	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.29	0.38	0.18	0.16	0.58	nd	nd	nd	10.3	nd	nd	nd	nd	nd	nd	nd	nd

CMS Property Associates Remediation Site **North Off-site Monitoring Well MW-11**

After Implementing Interim Remedial Measures (June 1998)

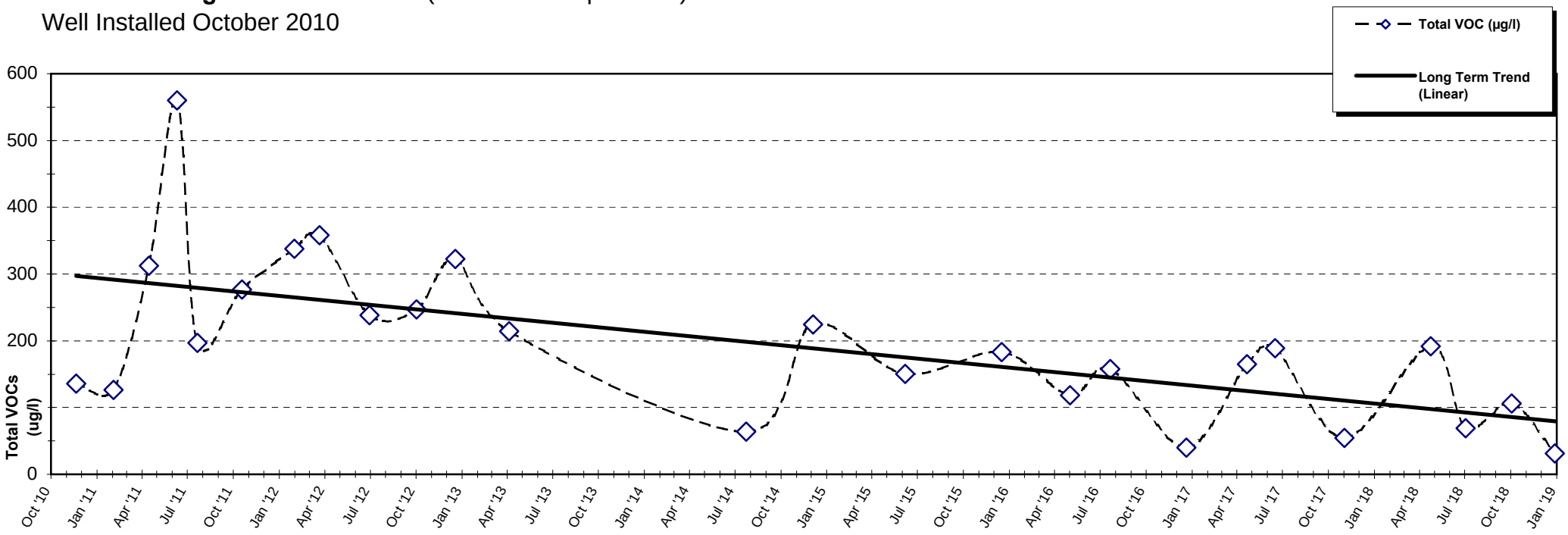
Well Installed Nov 1998



Date	Jun '03	Aug '03	May '04	May '05	Jan '06	Jun '06	Sep '06	Oct '08	Apr '09	Apr '10	Apr '11	Oct '11	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Dec '18
TVOCs	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.29	0.26	0.35	0.33	**	0.79	0.59	nd	0.81	nd	nd	nd	nd	nd	nd

CMS Property Associates Remediation Site **Northwest Off-site Monitoring Well MW-12**

After Implementing Interim Remedial Measures (June 1998)
and Rebuilding Extraction Wells (back on line April 2010)
Well Installed October 2010

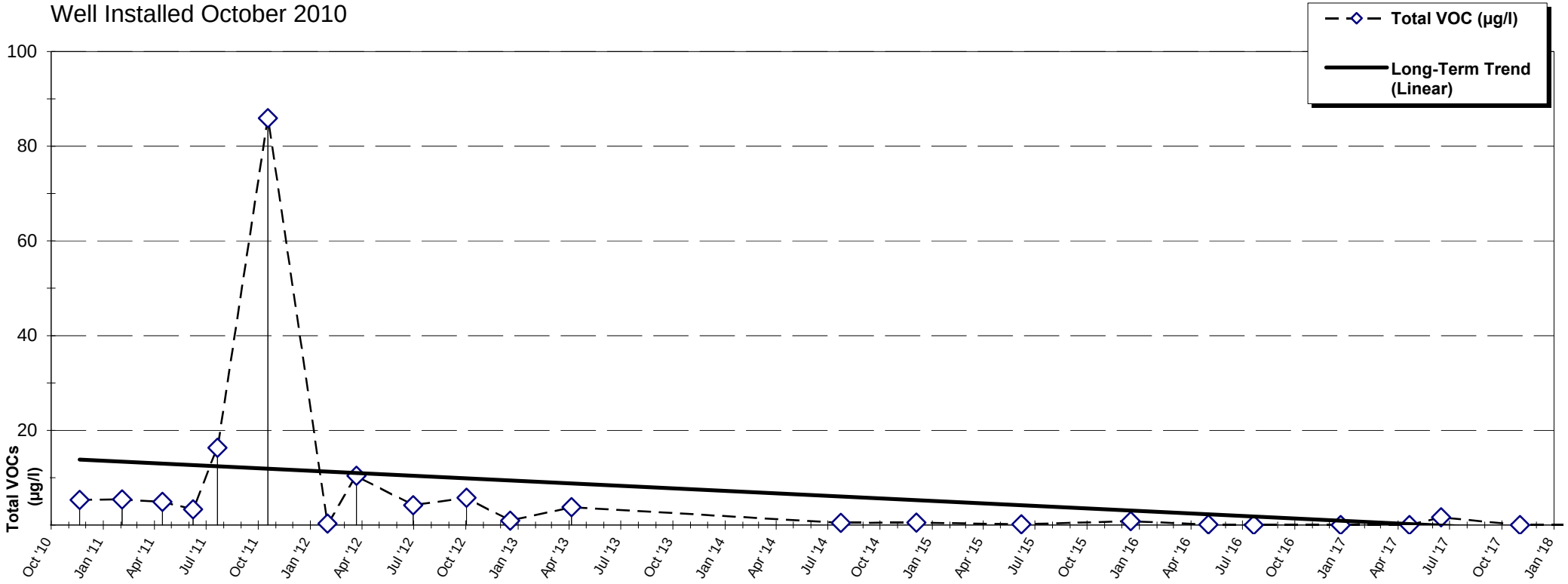


Date	Nov '10	Feb '11	Apr '11	Jun '11	Jul '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Dec '18
TVOCs	136	126	312	560	197	277	338	358	239	247	322	214	64	224	151	183	119	158	40	165	189	31

CMS Property Associates Remediation Site **Northeast Off-site Monitoring Well MW-13**

After Implementing Interim Remedial Measures (June 1998) and
Extraction Well Modifications (back on line April 2010)

Well Installed October 2010

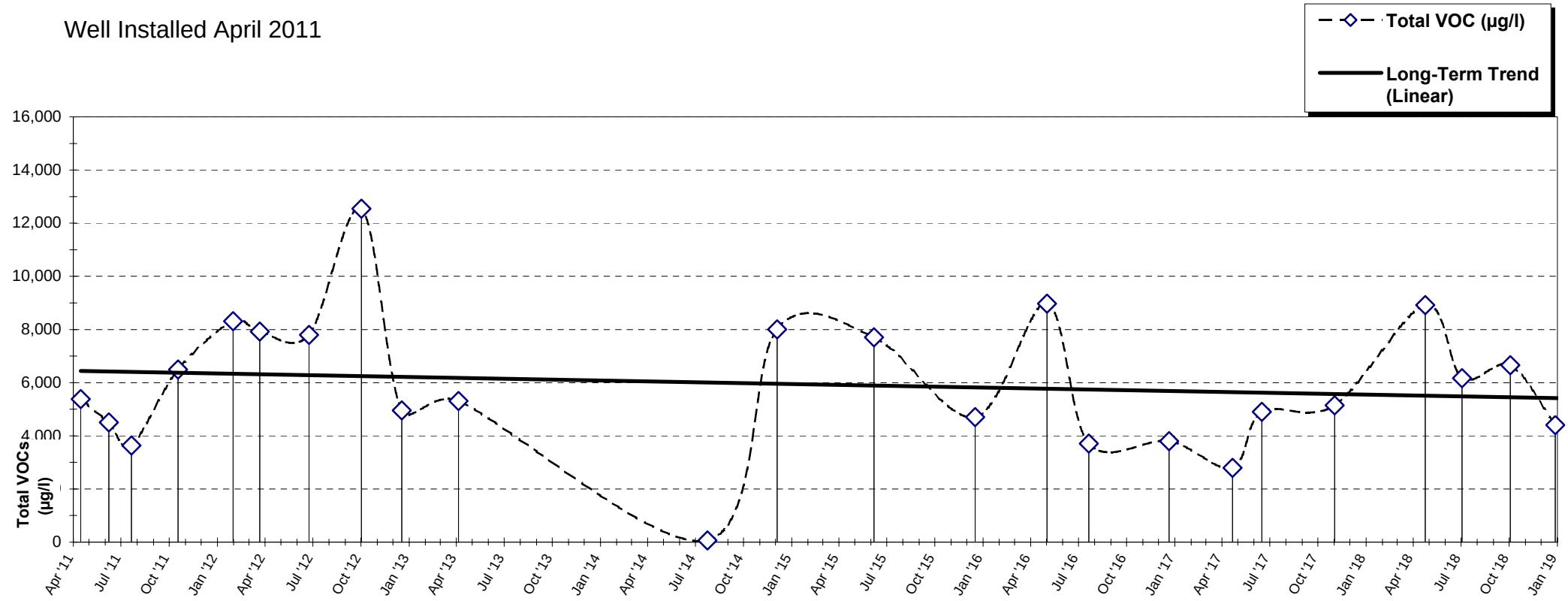


Date	Nov '10	Feb '11	Apr '11	Jun '11	Jul '11	Oct '11	Jan '12	Mar '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	5.3	5.4	4.9	3.3	16.3	85.92	0.32	10.4	4.19	5.77	0.92	3.77	0.48	0.51	0.16	0.83	0.1	nd	nd	nd	1.61	nd	nd	nd	nd	nd

CMS Associates Remediation Site **East-South Perimeter Monitoring Well MW-14**

After Implementing Interim Remedial Measures (June 1998) and
Extraction Well Modifications (back on line April 2010)

Well Installed April 2011

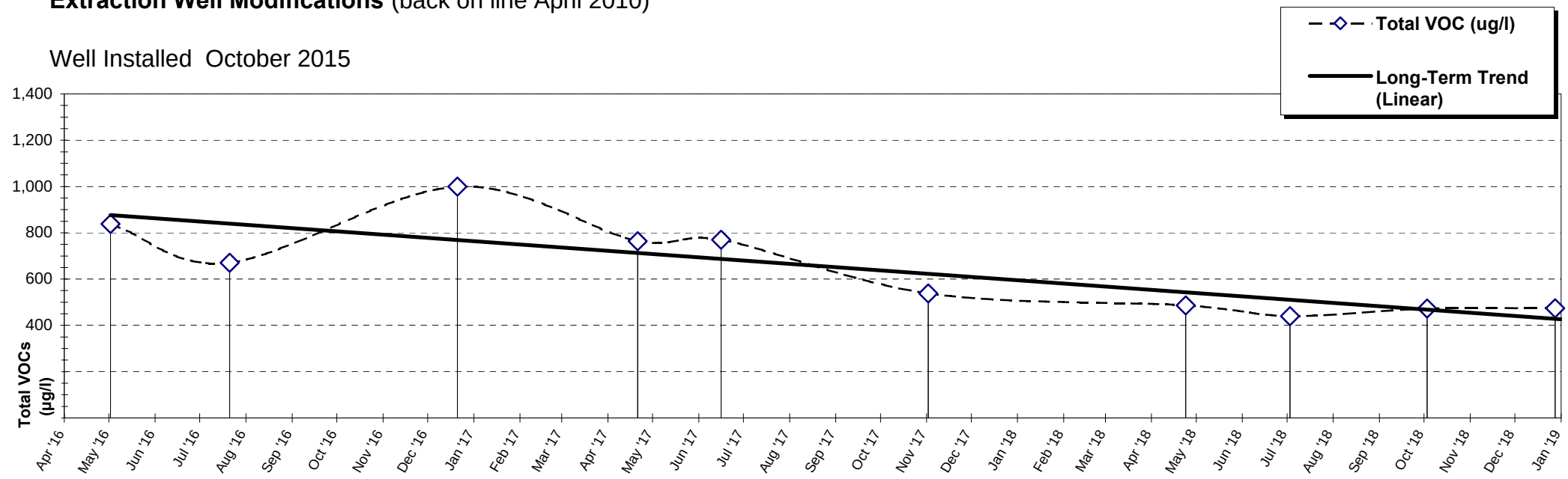


Date	Apr '11	Jun '11	Jul '11	Oct '11	Jan '12	Jun '12	Oct '12	Dec '12	Apr '13	Jul '14	Dec '14	Jun '15	Dec '15	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	5,380	4,500	3,640	6,498	8,308	7,794	12,548	4,955	5,308	61	8,006	7,710	4,704	8,969	3,710	3,801	2,798	4,902	5,142	8,917	6,169	6,660	4,408

CMS Associates Remediation Site **Southeast Perimeter Monitoring Well MW-15**

After Implementing Interim Remedial Measures (June 1998) and
Extraction Well Modifications (back on line April 2010)

Well Installed October 2015



Date	May '16	Jul '16	Dec '16	Apr '17	Jun '17	Nov '17	Apr '18	Jul '18	Oct '18	Dec '18
TVOCs	838	670	999	763	770	538	487	440	473	474

APPENDIX C

List of COCs and 8260 Analyte list with Groundwater SGCs

CMS REMEDIATION SITE

Volatile Organic Compounds Tested For - EPA Method 8260

CAS No.	Compound		Groundwater SCG (µg/l)	Observed in MW-	And
630-20-6	1,1,1,2-Tetrachloroethane		5	--	
71-55-6	1,1,1-Trichloroethane		6	1,2,3,4,5,9,14	UST, soil
79-34-5	1,1,2,2-Tetrachloroethane		5	1,2	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane		5	1,2,3,7,14	
79-00-5	1,1,2-Trichloroethane		1	1,2,5	
75-34-3	1,1-Dichloroethane		5	1,2,3,4,5,6,7,8,9,12,13,14	UST, soil
75-35-4	1,1-Dichloroethene		5	1,2,3,4,5,7,8,9,14	
96-18-4	1,2,3-Trichloropropane		0.04	2	
120-82-1	1,2,4-Trichlorobenzene		5	--	
95-63-6	1,2,4-Trimethylbenzene		5	1,2,3,4,6,9,13,14	UST
96-12-8	1,2-Dibromo-3-chloropropane		0.04	--	
106-93-4	1,2-Dibromoethane	Ethylene dibromide	0.0006	--	
95-50-1	1,2-Dichlorobenzene		3	4	
107-06-2	1,2-Dichloroethane		0.6	1,2,3,5,6,7,8,9,12	
78-87-5	1,2-Dichloropropane		1	3	
108-67-8	1,3,5-Trimethylbenzene		5	1,2,3,4,13,14	
96-23-1	1,3-Dichloro-2-propanol		--	1,2	
541-73-1	1,3-Dichlorobenzene		3	--	
106-46-7	1,4-Dichlorobenzene		3	1,2,3,4	soil
107-07-3	2-Chloroethanol	Ethylene chlorohydrin	50	--	
110-75-8	2-Chloroethyl vinyl ether		--	--	
78-93-3	2-Butanone	Methyl ethyl ketone	50	2,3,4	
106-43-4	4-Chlorotoluene		5	--	
99-87-6	4-Isopropyltoluene		5	1,3,4,13	
67-64-1	Acetone		50	14	
107-05-1	Allyl chloride		5	1	
71-43-2	Benzene		1	1,4,5,6,7,8,12,13,14	soil
100-44-7	Benzyl chloride		--	--	
39638-32-9	Bis(2-chloroisopropyl) ether		--	--	
598-31-2	Bromoacetone		--	--	
108-86-1	Bromobenzene		5	--	
74-97-5	Bromochloromethane		5	--	
75-27-4	Bromodichloromethane		50	--	
75-25-2	Bromoform		50	--	
74-83-9	Bromomethane		5	1,2,6,8,9	
75-15-0	Carbon disulfide		60	1,3,4,13	

CMS REMEDIATION SITE

Volatile Organic Compounds Tested For - EPA Method 8260

CAS No.	Compound		Groundwater SCG (µg/l)	Observed in MW-	And
56-23-5	Carbon tetrachloride		5	2	
108-90-7	Chlorobenzene		5	8	
124-48-1	Chlorodibromomethane		50	--	
75-00-3	Chloroethane		5	1,2,3,5,6,7,9,12	
67-66-3	Chloroform		7	1,2,3,4,5,6,7,9,14	
74-87-3	Chloromethane	Methyl chloride	5	2,6,13,14	
107-30-2	Chloromethyl methyl ether		5	--	
126-99-8	Chloroprene		5	--	
156-59-2	cis-1,2-Dichloroethene		5	1,2,3,4,5,6,7,8,9,12,14	soil
10061-01-5	cis-1,3-dichloropropene		0.4	8	
110-82-7	Cyclohexane		--	1,2,3,4,5,6,7,12,13,14	
124-48-1	Dibromochloromethane		50	--	
74-95-3	Dibromomethane		5	--	
75-71-8	Dichlorodifluoromethane		5	--	
106-89-8	Epichlorhydrin	Epichlorohydrin	--	--	
100-41-4	Ethylbenzene		5	1,2,3,4,5,6,13,14	soil
87-68-3	Hexachlorobutadiene		0.5	--	
98-82-8	Isopropylbenzene		5	2,3,4,6,13	
1634-04-4	Methyl tert-butyl ether		10	4,8	
75-09-2	Methylene chloride		5	2,3,6,7,8,9,13,14	UST, soil
91-20-3	Naphthalene		10	1,4,13	
103-65-1	n-Propylbenzene		5	2,3,4,13	
135-98-8	sec-Butylbenzene		5	3,13	
100-42-5	Styrene		5	4,6,8,13	
127-18-4	Tetrachloroethene		5	1,2,3,4,5,6,9,13,14	UST, soil
108-88-3	Toluene		5	1,2,3,4,5,6,13,14	soil
156-60-5	trans-1,2-Dichloroethene		5	1,2,3,5,8	
10061-02-6	trans-1,3-dichloropropene		0.4	2	
79-01-6	Trichloroethene		5	1,2,3,5,6,7,8,9	soil
75-69-4	Trichlorofluoromethane		5	7	soil
75-01-4	Vinyl chloride		2	1,2,3,5,6,7,8,9,12,14	
179601-23-1	m,p-Xylene		5	1,2,3,4,6,13,14	soil
1330-20-7	m-Xylene	1,3-Xylene	5	2,6,14	
95-47-6	o-Xylene	1,2-Xylene	5	1,2,3,4,5,6,13,14	soil
106-42-3	p-Xylene	1,4-Xylene	5	6,9	
1330-20-7	Total Xylenes		5	1,2,3,4,5,6	

APPENDIX D

Groundwater Elevations – May 1996 to December 2018

CMS Associates Remediation Site NYSDEC # 9-15-168

210 French Road; Cheektowaga NY Groundwater Well Observations

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	
ORIGINAL WELLS												
Rim	626.34	627.47	626.82	625.61	623.95	627.12	628.95	627.46	626.00	627.04	624.27	
Ground	626.3	627.5	626.8	625.6	624.0	624.2	627.0	627.5	626.0	627.0	624.7	
Bedrock	622.0	622.2	622.0	?	622.5	?	622.1	621.1	621.2	623.0	621.8	
Top of PVC	626.10	627.24	627.24	625.36	623.75	626.92	628.68	627.16	625.50	626.50	623.99	
Oct 9, 1996	623.2	624.8	624.5	623.0	618.4	618.6	615.9	621.0				
Oct 21, 1996	622.8	625.3	624.3	606.3	618.7	615.5	618.0	619.0				
Oct 31, 1996	623.0	625.2	624.3	607.7	618.7	617.1	617.1	620.0				
Mar 18, 1997	622.8	623.6	625.6	619.0	619.1	618.0	620.1	621.0				
Mar 20, 1997	624.3	623.0	625.6	619.1	619.0	618.2	620.2	621.4				
Aug 22, 1997	623.6	625.1	624.5	611.0	618.2	613.4	618.3	618.6	623.6			
Nov 5, 1998				618.7	617.0	616.4	614.8	620.0		617.4	619.0	
Dec 3, 1998				619.4	617.0	617.3	615.1	620.2		614.4	617.7	
Jan 12, 1999										615.0	618.2	
Feb 10, 1999				619.6	615.6	617.2				619.1	620.8	Snow piles
Mar 1, 1999				624.8	618.2	617.8	617.8	621.0		617.4	619.0	Snow piles
Apr 7, 1999				624.2	617.8	618.8	618.8	621.0		617.8	618.1	
May 11, 1999					617.6	618.5	618.2	621.3		617.4	617.7	
Jun 14, 1999				624.5	618.0	618.0	616.1	621.4		614.8	617.3	
Jul 12, 1999				607.9	617.2	611.3	614.8	620.5		613.9	617.3	

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	
Aug 11, 1999				607.5	617.4	616.3	615.1	620.2		613.8	617.7	
Jun 13, 2000	624.1	624.8	624.9	624.8	618.2	618.5	618.5	622.0	623.6	617.9	619.4	
Oct 31, 2001	624.6											
Sep 25, 2002				620.6	618.2	618.2	614.2	620.0		614.6		MW-4,8 tampered/w, tubing
Jun 26, 2003					618.2	612.3	617.6	621.8		616.7	618.2	
Aug 8, 2003				607.1	618.0	611.3	618.5	621.3		618.4	618.6	MW-8 under pressure
Nov 6, 2003					618.1	611.7	617.4	619.2		617.9	619.3	
Mar 30, 2004	624.5	623.7		617.3	619.7	613.1		620.6	624.6	620.1	617.0	MW-5 under pressure
May 27, 2004	626.1	625.8	625.8	611.2	619.7	614.5	619.5	622.2	625.0	619.1	619.3	MW-4,6,8 pressure, 7 vacu
Jun 25, 2004				609.1	618.1	612.2	618.1	622.4		617.1	618.9	
Sep 26, 2004	624.8	624.2	624.7	614.8	617.3	614.8	613.7	621.5	622.4	615.8	619.0	MW-4 pressure, 7 dry
May 21, 2005				614.1	617.3	615.5	615.4	621.9		617.3	618.3	MW-4 high pressure
Jan 31, 2006	624.3	626.0	625.8	617.5	617.8	611.4	617.1	621.6	619.0	619.4	620.2	
Dec 14, 2006				613.5	623.8	611.4	615.9	622.4		617.7	619.7	MW-4 pressure, 7 vacuum

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	
Mar 26, 2007	625.3	625.8	625.8	610.6	619.3	613.9	620.6	624.1	624.4	620.4	620.6	Pump had been running
Mar 17, 2008	625.8	626.4	626.3	606.4	619.3	618.3	619.4	622.5	625.4			
Apr 15, 2008				613.3	617.9	609.3	618.9	621.8		619.5	618.9	
May 17, 2008				612.8	617.5	608.8	618.6	621.2		619.2	618.5	
Jun 12, 2008				612.7	617.5	608.8	618.4	621.2		619.1	618.4	
Jul 26, 2008				613.3	617.7	609.0	618.6	621.3		619.2	618.7	
Oct 2, 2008				610.9	618.0	616.3	615.3	621.8		616.5	618.9	System down for tie-in

POST MW-5 TIE-IN (0ct 3, 2008)

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	
Rim	626.34	627.47	626.82	625.61	624.10	627.12	628.95	627.46	626.00	627.04	624.27	
Ground	626.3	627.5	626.8	625.6	624.1	624.2	627.0	627.5	626.0	627.0	624.3	
Top of PVC	626.10	627.24	627.24	625.36	623.88	626.92	628.68	627.16	625.50	626.50	623.99	
	Groundwater Surface Elevations											
Nov 15, 2008	626.1	627.2	616.3	613.1	623.9	609.0	613.8	620.2	625.5	618.7	619.8	
Dec 14, 2008	626.1	627.2	616.2	613.2	623.9	609.0	613.9	617.2	625.5	618.7	619.8	
Feb 26, 2009			616.2	613.1	623.9	609.0	613.8	620.3		618.7	620.2	
Apr 19, 2009				611.0	623.9	612.9	614.7	622.7		620.3	620.8	MW-4,6,7 under pressure
May 25, 2009			623.7	613.1	623.9	609.1	617.0	619.6		616.2	617.0	
Jun 26, 2009			621.3	613.5	623.9	611.6	617.1	620.0		617.4	617.3	
Jul 25, 2009			622.2	613.3	623.9	610.0	617.2	620.3		619.8	618.0	
Aug 30, 2009			622.5	607.9	623.9	609.7	618.4	619.8		613.6	617.5	
Sep 29, 2009			622.0	605.4	623.9	609.4	615.4	619.5		612.7	616.1	System down - well repairs started, then manifold found broken

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11

POST EXTRACTION WELL REPAIRS (Nov 8, 2009)

Rim	626.29	627.42	626.84	625.61	624.10	627.12	628.95	627.46	625.93	627.04	624.27	
Ground	626.3	627.4	626.8	625.6	624.1	624.2	627.0	627.5	625.9	627.0	624.3	
Top of PVC	626.10	627.24	626.62	625.36	623.88	626.92	628.68	627.16	625.50	626.50	623.99	
	Groundwater Surface Elevations											
Jan 26, 2010	623.8	625.4	625.3	613.0	619.6	611.9	617.2	621.3	623.3	617.9	616.5	
Feb 24, 2010	624.2	625.1	624.7	617.7	618.3	613.4	618.4	622.9	625.3	618.9	620.4	
Apr 8, 2010	625.0	625.3		609.8		611.6	620.7	622.5	624.9	620.8	620.6	All elevs before retrofits
Apr 13, 2010					619.9							MW-3 closed off

POST EXTRACTION WELL RETROFITS (Apr 14, 2010)

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	
Rim	626.29	627.42	626.84	625.61	624.10	627.12	628.95	627.46	625.93	627.04	624.27	628.49	629.01	631.38		
Ground	626.3	627.4	626.8	625.6	624.1	624.2	627.0	627.5	625.9	627.0	624.3	625.5	626.2	629.2		
Bedrock	622.0	622.2	622.0	?	622.5	620.5	622.1	621.1	621.2	623.0	621.8	620.0	621.4	622.2		
Top of PVC	625.8	627.0	626.5	625.4	623.9	626.9	628.7	627.2	625.5	626.5	624.0	628.2	628.7	631.1	634.1	
	Groundwater Surface Elevations															
Aug 18, 2011	621.6	622.4	622.5	611.9	617.4	617.3	dry	621.2	622.7	615.3	617.9	616.9	622.5	621.6		Reading after GWE/TS running several days
Oct 17, 2011	614.9	620.8	626.0	615.7	616.1	618.1	dry	617.5	621.3	619.1	619.3	618.8	625.4	621.4		
Oct 18, 2011	614.9	624.6	626.0	615.2	616.1	615.9	dry	617.1	615.0	619.1	618.6	618.5	625.1	619.5		GWE/TS pumping regularly, readings w/ pump running >2 hrs.
Nov 12, 2011	615.5	625.0	622.3	613.8	617.8	615.4	dry	618.5	622.4	617.5	619.3	617.3	624.9	622.9		GWE/TS running; after heavy rain days
Dec 12, 2011			621.7				617.9									Pumping regularly, readings w/ pump running >1 hrs; mw-1,2,3 closed off
Dec 24, 2011	625.1	626.6	624.7	616.3	616.5	612.6	dry	619.7	616.2	617.7	621.2	616.3	624.8	623.5		Pumping regularly, readings w/ pump running >1 hrs; mw-1,2,3 closed off
Jan 26, 2012	623.4	624.2	625.0	616.6	623.2	618.1	618.9	622.0	611.9	618.8	620.8	617.6	624.8	622.6		Pumping regularly, readings w/ pump running >1 hrs; mw-1,2,3 closed off
Mar 21, 2012	616.6	617.2	623.3	624.7	620.5	10.1	618.6	618.5	616.5	618.9	618.9	617.3	624.5	623.2		Pumping 24/7 for week w/ PV-8 pump @20" Hg; mw-3 closed; mw-4 plug loose so high level (prior reads under pressure?)
Apr 16, 2012	618.8	617.4	614.3	607.5	609.4	610.2	617.7	621.9	617.5	617.9	618.6	617.0	624.1	622.8		Pump 24/7 w/P-8 @ 24" Hg; MW-3 open; MW-4 plug loose.
Apr 26, 2012	615.0	619.3	624.1			610.7			618.7							Pump 24/7; MW-3 open , plug loose;
May 22, 2012	617.2	618.6	623.3	625.0	615.6	611.8	617.4	621.8	615.8	617.4	618.2	617.0	623.7	622.6		Pump 24/7; MW-3 open , plug loose;
Jun 23, 2012	623.6	624.1	623.7	625.2	616.5	612.8	616.9	621.6	623.2	616.9	617.9	616.7	623.3	622.3		Pump down 6/1; MW-3,4 plugs loose;
Jul 28, 2012	623.2	623.9	623.3	607.4	617.2	610.0	615.6	621.3	624.7	615.6	618.2	616.9	622.5	622.0		GWE/TS down; mw-3 was/left loose; mw-8 was tight/left loose, under slight pressure.
Aug 1, 2012		623.8	623.2	607.4		610.1		621.3	622.7							day after rain; GWE/TS still down; mw-3 was/left loose; mw-8 was loose/left loose.
Sep 2, 2012			622.1	608.2	616.9	611.2	615.0	621.2		615.0	6.2	616.7	621.6			straws set to test depths,
Oct 1, 2012	623.4		614.5	609.6	616.8	610.0	616.8	621.3	607.8	616.8	618.0	616.8	623.6	622.2		sys running ok
Nov 18, 2012			624.0		616.5	610.1	617.2	621.8		617.5	619.6	616.9	624.5	626.3		sys @ 20"
Dec 17, 2012	620.1	614.8	625.5	625.3	617.2	613.9	618.1	622.3	610.5	618.4	621.2	617.3	625.0	624.9		sys at 25"
Feb 7, 2013	623.7	624.0	624.5	607.1	618.2	613.4	618.4	622.3	624.1	619.0	621.1	617.2	625.0	623.4		sys off;
Apr 5, 2013	624.7	624.6	624.2	621.4	618.2	618.2	619.2	622.2	624.1	619.3	620.9	617.3	624.4	623.1		sys off;
Jun 16, 2013	624.5	614.5	615.0	609.4	618.4	617.9	618.8	622.2	617.4	618.6	619.9	617.4	624.2	622.6		sys on
Jul 17, 2013	623.8	614.3	614.9	609.8	618.3	617.9	618.7	622.0	617.1	618.5	619.5	617.6	624.0	622.5		sys on
Sep 26, 2013	620.8	614.5	614.8	625.0	618.1	617.7	618.6	621.9	617.0	618.4	619.2	617.5	623.7	622.4		sys on;
Oct 15, 2013	622.6	613.5	614.0	609.1	614.3	617.4	615.9	621.6	614.5	615.8	617.9	616.9	623.1	622.3		sys @ 27", MW1 off
Oct 29, 2013	623.6	621.0	617.8	609.6	617.6	617.7	617.8	621.7	624.8	618.2	621.2	617.0	625.0	622.9		sys @ 28, MW1 off

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	
Dec 10, 2013	624.8	613.5	616.4	610.1	617.8	620.8	617.9	622.5	615.1	618.3	621.4	617.3	625.0	623.1		sys 27";
Dec 20, 2013	624.2	621.2	620.4													sys @ 20"
Feb 2, 2013	624.3	624.7	623.2	609.9	619.8	619.8	619.6	622.7	614.4	619.3	621.3	617.5	624.9	623.2		sys on
Apr 24, 2014	622.8		614.2	625.2	620.7	619.5	620.7	622.2	608.3	620.1	621.1	617.7	624.8	623.3		GWE/TS manifold operating @ 29" Hg, bailed manholes full of rainwater, note mw-4 at top of well
May 29, 2014		625.7	623.8	625.3	622.5	619.0	619.1	621.9	614.3	618.7	619.7	617.6	624.3	622.6		sys @ 27" Hg; ok. Mhs full of rainwater, pumped down.
Jul 23, 2014	624.3	619.7	623.1	625.3	617.9	618.1	618.0	621.9	617.3	618.0	618.0	617.0	624.2	622.6		sys @ 26" hg; ok. Note mw-4 near top; wells purged for sampling
Sep 30, 2014	622.9	623.6	624.8	607.7	617.6	617.1	616.3	621.4	618.5	10.3	617.8	616.7	622.6	622.2		GWE/TS @ 25" hg, ok.
Oct 15, 2014	623.8	623.9	624.6	610.4	617.8	617.4	617.6	622.1	622.4	617.4	618.1	616.8	623.6	626.0		
Nov 11, 2004	624.3	624.8	624.1	611.0	618.1	617.6	617.5	622.2	623.4	617.6	618.4	617.1	624.6	626.7		
Dec 1, 2014	613.8	614.0	614.0	611.4	618.9	618.9	619.8	623.5	620.4	621.2	623.0	618.4	625.8	624.1		
Jun 6, 2015	616.1		616.9	608.4	622.2	617.5	618.9	621.8	624.8	618.8	618.0	617.0	624.3	622.6		mw-2 vac line blocked, mw will be disconnected from sys until cleared
Nov 14, 2015	625.4	624.1	626.2	625.2	622.4	617.4	617.0	621.9	625.2	617.3	618.3	616.8	623.9	622.5		mw-3 and mw-9 MH full of H2O;; mw-5 bailer stuck, bottom of well full of road grit?; pumped dry 5x; very fast recovery;
Dec 17, 2015			626.2	607.2					624.6	617.4					613.6	mw-5 plug broken- no reason observed why.
Feb 2, 2016	623.8	625.0	624.8	607.1		618.1	619.0		618.2	619.5	621.6	617.5	625.2	623.5	619.6	mw-8 frozen over; mw-9 MH full of H2O; mw-5 appears compromised/leaking; cannot purge to dry
Apr 29, 2016				608.1		617.9	619.2	621.4		619.1	618.3	617.2	624.4	622.7		mw-15 bailed 5.5b, btm 1' remains v cloudy; mw-16 @6.49; bailed 2b, btm 2' remains v cloudy; mw-4 plug loose, H20 filled to top' mw-9 mh full of H20; mw-5 full of H20, muddy
Jul 20, 2017	622.1	623.3	624.9	606.6		616.8	615.9	621.7	622.5	616.0	618.1	616.7	620.6	621.7	620.2	sys vac was off;
Jul 21, 2016	616.2		613.9						617.9						619.3	w/ GWE/TS vac running;
Oct 19, 2016	625.0		624.1	605.7		617.1	617.0	621.5	617.4	617.0	619.0	617.0	623.9	622.1		mw-1 MH full of H2O; MW-16 dry
Dec 21, 2016	614.1	624.7	623.7	607.2		617.5	616.8		613.0	618.6	619.5	616.7	625.1	622.8	620.1	mw-8 frozen over
Jan 26, 2017	615.0	624.2	622.9	625.2		618.5	619.2	622.9	615.7	619.4	619.9	617.5	624.9	12.7	621.5	mw-1 MH full of H2O; MW-16 -5.28'; mw-8 cover missing
Feb 24, 2017		624.3	622.0	609.3		618.4	619.4		617.0	619.2	619.4	617.3	624.6	12.8	621.3	
Apr 1, 2017	620.3	624.4	621.0	608.7		618.0	618.5	622.7	616.2	619.0	619.1	617.2	624.1	13.1	621.0	mw-1 MH full of H2O; MW-16 -dry; mw-2 dis
May 3, 2017	621.5	624.2	619.9	608.6		617.8	618.2	622.7	616.0	618.5	618.5	617.1	624.0	13.5	620.6	mw-1 MH, -9 full of H2O; MW-16 -7.0; mw-2 disconnected
Jun 1, 2017	620.6	624.2	618.3	608.4		617.5	621.7	622.5	607.2	618.4	618.2	617.0	623.9	14.0	620.2	mw-2 disconnected; mw-9 rose to 16.7 after 20 min; mw-16 @ 6.75
Jun 16, 2017	619.5	624.2	614.3	608.5		10.8	617.9	621.2	622.5	4.8	619.2	616.7	623.2	13.3	620.8	mw-1 mh full of h2o; mw-2 disconnected; mw-13 btm sl cloudy, much improved; mw-16 dry
Aug 16, 2017	622.8	624.4	623.6	605.3		617.2	617.5	618.5	623.0	617.6	617.8	616.9	623.2	14.5	619.6	mw-2 disconnected; mw-9 issues w/ bleed drawing down h20 in mh (low pumop vac?) mw-13 btm 3' muddy.
Jul 8, 2017	621.4	623.9	621.0	608.5		617.1	616.6	620.1	618.0	617.5	617.9	616.9	623.2	13.1	621.0	mw-2 disconnected;
Oct 6, 2017	614.0	#VALUE!	620.1	606.1		617.1	616.1	620.8	617.6	616.2	618.4	617.0	623.1	14.0	620.2	mw-2 disconnected;
Nov 2, 2017	620.7	624.3	622.5	611.3		618.6	622.0	622.8	622.3	620.7	620.6	618.5	625.0	13.0	621.2	mw-2 disconnected

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	
Dec 2, 2017	620.4	624.2	621.3	608.3		618.8	621.9	623.1	617.2	616.4	620.7	618.6	625.5	12.2	621.9	mw-2 disconnected;
Feb 20, 2018	622.5	625.1	618.3	607.7		619.2	621.4	623.4	617.5	624.7		619.4	625.0	13.2	621.0	mw-11 under water; -2 disconnected;
Apr 12, 2018	612.8	624.9	612.5	609.0			621.8	622.6	605.5	620.3	618.5	617.5	624.3	12.9	621.2	mw-2 disconnected;
May 5, 2018	612.3	625.1	625.2	605.0		618.6	620.8	622.5	624.2	619.9	621.3	618.0	624.0	18.4	615.8	mw-2 disconnected;
May 29, 2018	611.9	623.9	613.8	605.2		617.8	619.4	622.3	608.0	618.5	618.2	617.0	623.8	15.6	618.5	mw-2 disconnected;
Jul 3, 2018	617.4	624.5	613.7	605.4		617.5	618.5	622.2	606.6	618.1	617.9	616.8	623.9	14.2	619.9	mw-2 disconnected;
Jul 30, 2018	615.2	624.1	613.6	604.5		617.2	617.8	621.6	616.9	617.3	617.9	616.8	623.4	17.8	616.3	mw-2 disconnected;
Oct 3, 2018	624.0	625.0	625.3	604.6		617.9	618.7	621.9	624.1	617.8	618.5	622.0	624.5	14.6	619.6	mw-2 disconnected;
Nov 15, 2018	612.0	623.7	615.2	605.2	617.3	617.9	618.1	620.8	608.6	618.4	618.8	617.2	624.5	13.3	620.8	mw-2 disconnected;
Dec 28, 2018	622.1	625.3	622.4	605.3	617.7	618.1	619.7	621.7	619.7	619.1	620.6	617.2	624.5	13.5	620.6	mw-2 disconnected;

APPENDIX E

Extraction System Zone of Influence – Groundwater & Environmental Services; June 2019

Groundwater
& Environmental Services, Inc.

Environmental Informatics Group
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M E M O R A N D U M

DATE: June 28, 2019
TO: Ken Kloeber, Ken W. Kloeber Consulting Engineers
FROM: Don Lundy, GES
RE: CMS Associates Remediation Site, 210 French Road, Cheektowaga, NY, Capture Zone Modeling

This memorandum documents a flow model of groundwater in shallow bedrock at the CMS Associates Remediation site located at 210 French Road, Cheektowaga, New York. The modeling was performed by GES as part of an evaluation of groundwater contaminant migration that originated from historical releases from an underground storage tank (UST) removed from the CMS site in 1996.

The model simulates a groundwater flownet that represents the average groundwater flow pattern across the site and parts of adjoining properties. The groundwater flow pattern is influenced by the natural hydrogeological conditions and pumping of groundwater from three, and sometimes four, onsite remediation wells. Output from the model represents average rates of natural groundwater flow across the site, and the effects of withdrawals from recovery wells operating near the center of the site since the late 1990s.

Historical annual reports with monthly groundwater withdrawals prepared for the NYSDEC by Kloeber Consulting Engineers were used with the mapping of water-table configurations and Total Volatile Organics (VOCs), and the analysis of aquifer tests by GES to develop a conceptual understanding of the aquifer and use that to prepare a steady-state flow model for the site and vicinity. This memorandum provides documentation of model inputs, outputs, and implications of model output for controlling migration of the VOCs and exposure potential posed to onsite and offsite workers and the natural discharge zone associated with Cayuga Creek.

Data Inputs

In order to model the flow of groundwater one must quantify the following model parameters:

- *Aquifer transmissivity*, equal to mean hydraulic conductivity multiplied by aquifer saturated thickness.
- *Hydraulic gradient*, the slope of the water table under non-pumping conditions, and
- *Groundwater withdrawal rates*, from active recovery wells.

Aquifer Transmissivity

The most representative aquifer transmissivity data in-hand is in the form of three packer tests that were performed on open-rock boreholes. These tests are considered more representative than the more numerous (eight) slug tests performed at monitoring wells. The transmissivity values range from 17.6 to

26.4 ft^2/day. Hydraulic conductivity averages approximately 2.1 ft/day. Assuming a 10-ft thick zone of fractured-rock that represents the local water table aquifer, the average transmissivity is 21 ft^2/day.

Hydraulic Gradient

The site is situated uphill and upgradient of two local streams that are assumed to generally be gaining streams that intersect the water table. These streams are Cayuga Creek and Slate Bottom Creek (see **Figure 1**, Site Location Map). A line from upgradient well MW-15 to downgradient well MW-5 (installed in the late 1990's) could be extrapolated to the approximate confluence of these two streams. Assuming that shallow groundwater is flowing to both streams, this line would separate flowlines that terminate at the two streams. That flow pattern is shown schematically with arrows on Figure 1.

Historical contour maps of the concentrations of the Total VOC groundwater plume are elongated in a NNW direction that is approximately symmetrical to the line between MW-15 and MW-5. Total VOCs effectively represent tracer compounds that collectively show the generalized direction of groundwater flow controlled by the local gradients. These observations support the idea that the MW-15 to MW-5 line closely approximates the average hydraulic gradient direction for the water table at this site.

In addition to a direction of the hydraulic gradient for groundwater flow, the model requires a magnitude of that gradient. That was estimated with two pairs of wells that are connected by lines that are approximately parallel to the line between MW-15 and MW-5. These are well pairs MW-8 to MW-12 and MW-14 to MW-11. Historical water levels measured at wells located between these two pairs are consistently exhibit elevations reduced by long-term pumpage from three or four recovery wells (MW-1, MW-2, MW-3, and MW-9). These recovery wells are located immediately north, south, and west of the former UST contaminant source, and the drawdown cones created by pumping them overlap and cause a depression in the water table proximate to these four wells.

Water levels and hydraulic gradients between the pairs of wells located upgradient and downgradient of the recovery wells are much less affected by the pumpage, and are more representative of the local average water-table gradient. Gradients for selected dates between 2011 and 2016 were found to range from 0.0046 and 0.0086, and average approximately 0.006 feet/foot. That average value was selected for steady-state flow modeling reported here.

Recovery Well Pumping Rates

Recovery wells (MW-1, MW-2, MW-3, and MW-9) were installed in the late 1990s in the vicinity of the former leaking UST. For over two decades Kloeber Engineering has monitored the remediation site groundwater wells, and since 2007 has additionally maintained, upgraded, and monitored the groundwater production and treatment system operations. Monthly groundwater volumes pumped and treated are recorded manually using the operating time of the effluent pump and plotted to show variations and trends over time. The records show a wide range of monthly volumes, from zero when the system was down to a high of 29,000 gal/month during a high-precipitation month in late winter.

Not counting the historical downtime periods, 200 gal/day (0.14 gal/min) is selected as a reasonable historical average pumping rate for the four recover wells. That is equivalent to an average per-well rate of 50 gal/day, only 0.035 gal/min. These rates are consistent with small hydraulic conductivities and transmissivity values estimated by analysis of slug and packer tests at individual wells.

Flow Model Description

GES selected the steady-state analytical flow model developed and described in Bear (1979). It includes equations to calculate a steady-state groundwater flownet that can be used to estimate historical VOC plume capture zones consistent with available aquifer properties and operational data over the past 2 decades at the CMS facility.

The model is based on the following assumptions:

1) The aquifer is isotropic and homogeneous, and treats the fractured bedrock as an equivalent porous media.
2) The aquifer has a constant thickness and the hydraulic properties that do not depend on, or change with, directions of flow controlled by hydraulic gradients.
3) Prior to the start of pumping, the hydraulic gradient is assumed to have a specified constant magnitude and direction at all locations within the aquifer, creating "uniform flow" across the site.
4) Pumping rates can vary among each of the wells at specified locations in the model domain, but all withdrawal rates must be held constant through time.
5) Pumping from each well creates a spatially-dependent steady-state drawdown cone, with a shape influenced by the assumed hydraulic properties and non-pumping hydraulic gradient.
6) The gradient-influenced drawdown cones for each pumping well can be summed over the model domain to produce a composite area within which the altered gradients represent the combined flow influence of multiple wells.

The model calculates a set of equipotentials (hydraulic heads) and streamlines (flowlines) that can be plotted as separate layers, registered to the same scale and spatial coordinates so that together, they can compose a groundwater flownet.

GES solves the steady-state flow model initially with an Excel Workbook designed to test hypotheses and estimate pumping rates to contain groundwater plumes. The model has been tested against other models with the same inputs, and has been used to analyze tracer tests that involve an injection well and pumping well "dipole" arrangement (Lundy et al. 2009).

After a preliminary analysis with the Excel version, GES can run the model code re-written in Python, to produce the same output that is more compatible with GIS software. That provides a way to combine the two layers (hydraulic heads and flowlines) into a steady-state flownet that is registered to the same scale as a site base map and positioned relative to a north arrow. Another layer representing the VOC groundwater plume extent and concentrations can be included. These extra steps were performed here.

The groundwater capture zone is defined by a "limiting flowline" bounding a group of flowlines that extend from the upgradient boundary of the model domain to one or more pumping wells (Todd, 1959). The flowlines outside of the capture zone are influenced by the pumping wells, but continue downgradient beyond the pumping wells, representing groundwater that flow near the pumping wells but continue on to other real or hypothetical wells or natural discharge area(s).

Figure 2 is a map of the steady-state flownet generated with the Python code and mapped with GIS software. The flownet is superimposed on the CMS site base map along with a map of the Total VOC concentrations based on the December 2018 groundwater sampling event. The narrative below describes the VOC plume first, and the capture zone second.

VOC Plume

Four color-coded Total VOC concentration ranges are shown on the map and defined in the map legend. The curving boundaries between the zones can represent contours that increase in powers of 10, ranging from 10 ug/l to 10,000 ug/l. Three color-coded concentration zones are defined in a pattern common to older VOC plume maps for this site. There are two high-concentration zones in the upgradient part of the plume, bounded by a moderate area with intermediate concentrations that is bounded by the smallest area with the lowest concentrations. Along the centerline of the plume, VOC concentrations decline to the northwest, with distance along the hydraulic gradient in that direction.

There are two high-concentration areas that represent contaminant source areas: a smaller one near the former UST and a larger one that underlies the largest building onsite. The sizes of these are approximate, being controlled by distances between monitoring well locations where high concentrations were observed. The larger zone upgradient beneath the building is considered conservatively large, being defined by widely-spaced wells. But the pattern of three concentration zones with the widest and most concentrated zone upgradient, and declining concentrations in a narrowing plume moving downgradient, is seen on other historical total VOC maps prepared over the past decade. A stable pattern of contaminant concentration zones is commonly observed on older industrial sites with ageing source zones that become less concentrated over time as contaminant mass is transferred to flowing groundwater, and then depleted by biotic (biodegradation) and abiotic (volatilization) processes along the flowpath (ITRC, 1999).

Capture Zone

There are two parts to the flownet: a) the capture zone for the pumping wells (Figure 2), and b) the rest of the flownet that represents groundwater flowing towards the natural discharge area associated with Cayuga Creek located about 0.6 miles (~ 1 km) northwest of the site (Figure 1). Each is described below.

The capture zone is illustrated by a red parabolic curve that begins at a "stagnation point" centered at the lowest elevation along the curve and downgradient of the four pumping wells, from that point the capture zone boundary widens around the three pumping wells. Moving upgradient, and these two limbs, which are two flowlines positioned just outside the model-calculated flowlines, continue to extend upgradient far enough to become parallel to each other beneath French Road. The rate of groundwater flow between these two bounding flowlines equals the 200 gal/day withdrawal rates from the four pumping wells.

Superimposing the capture zone on the Total VOC plume shows how much (or how little) of the plume is currently being captured and treated under the average local gradient and withdrawal rate. As shown, the capture zone covers approximately 1/3rd of the total plume area, but it is catching more than a 1/3rd of the total mass flux of VOCs moving through the plume, which is roughly half of the mass flux moving through the high concentration zones.

This evaluation is limited to our estimate of average conditions that control the rate of natural groundwater flow and VOC concentrations of literally picked up and carried from the source areas. It is

understood that in the past, for a range of time periods the pumping rates and mass removal rates were either much smaller to much larger than what is shown here. But the common and more critical observation is that, while the plume capture efficiency varied, it never captured all, or even near all, of the VOC mass flux moving through the plume area.

Despite that reality, the VOC concentrations in groundwater samples collected from wells located downgradient of the CMS site (e.g., at MW-11 and MW-12), are different each time they are sampled. However, neither shows no change in a best-fit line, to a slight downward trend at wells that have long-term data for comparison. The remediation system continues to capture about one third of the mass flux leaving source areas remove mass, allowing uncaptured VOC to move on further downgradient.

Clearly, the VOC plume has migrated across the CMS site and continued beneath Industrial Blvd. But the concentrations of VOCs at offsite well MW-12 does not show higher concentrations over time, as one may expect. Rather, its concentrations exhibit normal low-level fluctuations in recent years. That is what one may expect and can confirm with subsequent monitoring events. That result would support a view that the mean plume size and concentrations are relatively unchanged, and the plumes deserve further monitoring to define and confirm the long-term trends.

Summary and Conclusions

GES performed steady-state groundwater flow modeling with representative inputs of aquifer properties and long-term average groundwater withdrawal rates at four recovery wells at the CMS site. The model-generated flownet was superimposed on the site base map along with a map of Total VOCs in recently collected groundwater samples.

The composite map shows a capture zone for an average pumping rate of 200 gal/day from four wells. The capture zone is approximately 200 ft wide underneath French Road at a distance of 430 ft upgradient of well MW-3, which is centrally located in the cluster of four recovery wells.

The capture zone encompasses approximately one-third of the mapped area of the Total VOCs plume. The remaining two-thirds of the mapped plume is not controlled by the engineered remedy. The un-captured area of the plume, extends approximately 100+ feet downgradient and off the CMS property.

Since 2013, Total VOCs plume concentration maps prepared by GES and submitted to the NYSDEC show similar ranges of VOC concentrations and contour patterns of those shown here. Despite the near-continuous operation of recovery wells which captures 1/3rd of the VOC plume, VOC concentrations and spatial contour patterns appear to be stable. This indicates that natural attenuation processes (volatilization and biodegradation), which are well established natural source zone depletion (NSZD) mechanisms are controlling further spreading of the plume in the water-table gradient direction.

References Cited

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ITRC, 1999. *Natural Attenuation of Chlorinated Solvents in Groundwater: Principles and Practices*, technical regulatory guidance prepared by Interstate Technology and Regulatory Cooperative Work Group and Industrial Members of the Remediation and Technologies Development Forum (RTDF), September 1999, 25 pages plus appendices.

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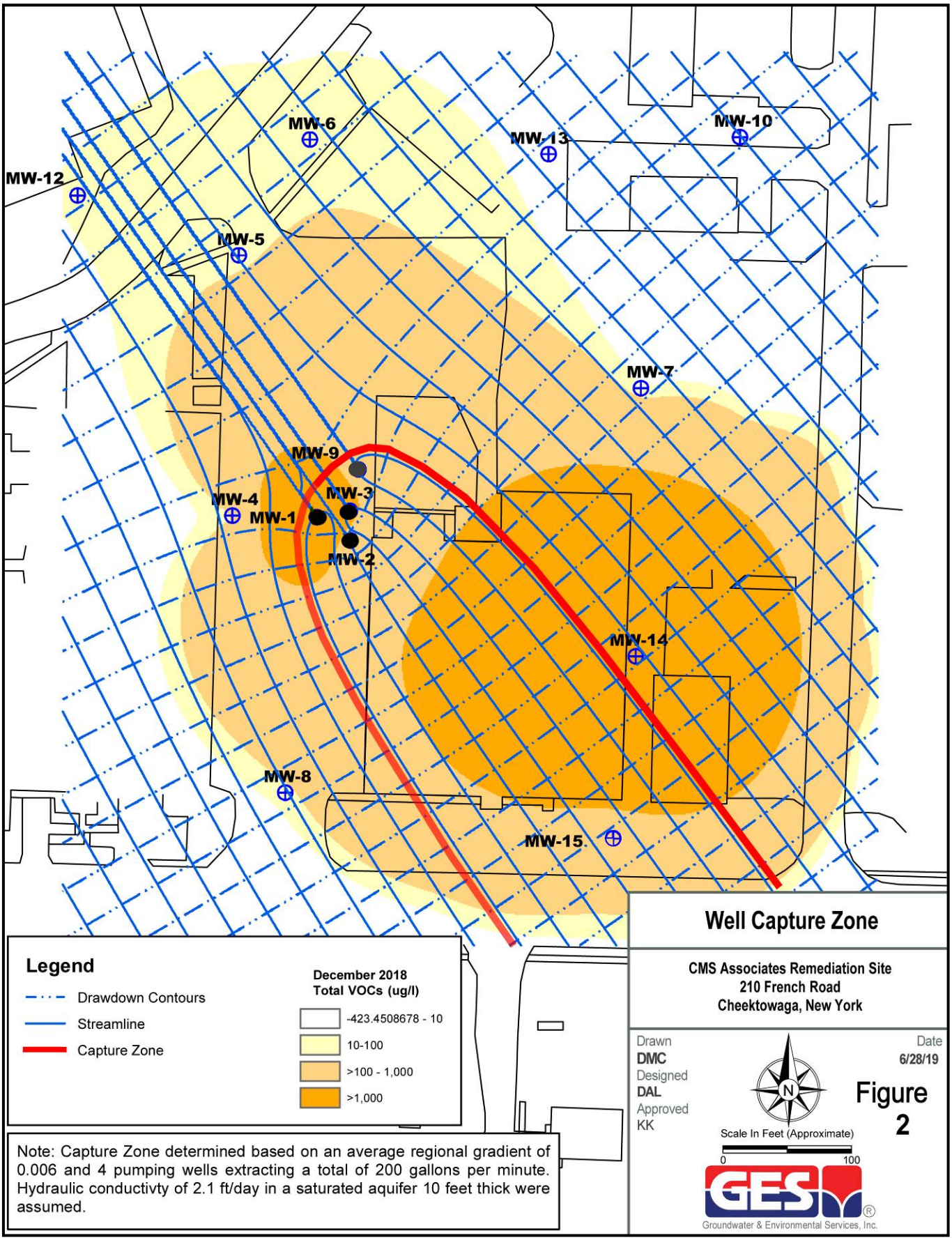
Figure 1. Aerial photograph showing the location of the CMS site relative to Cayuga Creek and Slate Bottom Creek. Blue arrows represent generalized groundwater flow directions inferred from topography and assuming both creeks are perennial streams that are continuously gaining groundwater discharge.


MW-6
MW-13
MW-10
MW-12
MW-5
MW-7
MW-9
MW-4
MW-3
MW-1
MW-2
MW-14
MW-8
MW-15
Legend
Drawdown Contours
Streamline
Capture Zone
December 2018
Total VOCs (ug/l)
-423.4508678 - 10
10-100
>100 - 1,000
>1,000
Note: Capture Zone determined based on an average regional gradient of 0.006 and 4 pumping wells extracting a total of 200 gallons per minute. Hydraulic conductivty of 2.1 ft/day in a saturated aquifer 10 feet thick were assumed.
Well Capture Zone
CMS Associates Remediation Site
210 French Road
Cheektowaga, New York
Drawn
DMC
Designed
DAL
Approved
KK
Date
6/28/19
N
Scale In Feet (Approximate)
0
100
Figure
2
GES
Groundwater & Environmental Services, Inc.