RESTORATION ADVISORY BOARD MEETING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), CALVERTON
CALVERTON COMMUNITY CENTER, CALVERTON, NEW YORK
TUESDAY, APRIL 4, 2017

The forty-sixth meeting of the Restoration Advisory Board (RAB) was held at the Calverton Community Center. Meeting attendees included representatives from the Navy (Joseph McCloud), New York State Departments of Environmental Conservation (NYSDEC) (Henry Wilkie) and Health (NYSDOH) (Steven Karpinski), Suffolk County Department of Health Services (SCDHS) (Doug Feldman, Andrew Rapiejko), Town of Riverhead (Drew Dillingham, Jodi Giglio), RAB Community Members (Lou Cork, Vincent Racaniello, Steven Shapiro [representing the Wading River Civic Organization]), the public (Adrienne Esposito [representing Citizens Campaign for the Environment], Andrew Freleng), the Riverhead News Review (Tim Gannon), Arcadis (Paul Martorano), Resolution Consultants (Robert Forstner, Michael Zobel), Tetra Tech (David Brayack, Kristi Francisco), and KOMAN Government Solutions (Stephane Roy, Patrick Schauble). The sign-in sheet is included as Attachment 1.

WELCOME AND AGENDA REVIEW

The Navy representative, Mr. Joseph McCloud, welcomed everyone to the RAB meeting and introduced the meeting agenda. The agenda for the meeting is included as Attachment 2. The Navy presentations are included in Attachment 3.

DISTRIBUTION AND APPROVAL OF MINUTES

Mr. McCloud asked whether the RAB members received the RAB meeting minutes from the November 2016 meeting, and if there were questions or comments on the minutes. There were no comments specific to the contents of the prior meeting, and the minutes for the November 2016 RAB meeting were approved.

COMMUNITY UPDATE

Mr. Vincent Racaniello (RAB co-chair) opened the floor to community members for topics of general discussion, but there were no general updates or questions posed and the technical presentations began.

TECHNICAL PROGRESS – GENERAL OVERVIEW OF INSTALLATION RESTORATION SITES

Mr. McCloud then introduced the technical portion of the meeting, which consisted of presentations on the Proposed Plan for Site 2, and current activities at Sites 2, 6A/10, 7 and the Southern Area.

SITE 2 GEOPHYSICAL INVESTIGATION UPDATE

Ms. Kristi Francisco (Tetra Tech) provided an overview of the Proposed Plan for Site 2, which was issued in March 2017 and for which an availability session had been provided prior to the RAB meeting. The

presentation is included in Attachment 3. The presentation began with a summary history of the site. Site 2 is located on property that remains under Navy ownership, and was an active Fire Training Area from the 1950s until 1996. As a result, soil and groundwater have been impacted by petroleum, chlorinated solvents, and other chemicals. In addition, potential residual munitions and explosives of concern (MEC), which likely originated at the cannon test area, are present at Site 2.

Remedial activities on the site included initial investigations and evaluations from 1986 through 2011, removal of contaminated soil from two spills in 1987, the operation of a groundwater recovery/oil-water separation system, from 1987 through 1996, removal of a 1,000 gallon tank in 1996, operation of an air sparge/soil vapor extraction (AS/SVE) system from 1995 through 2000, and removal of shallow petroleum-contaminated soils in 2008-2009. MEC response actions have included a program to excavate, screen and backfill the top 18 inches of soil on 6.9 acres of the site from 2012 to 2014, and an additional program to expand the margins of this area by 1.8 acres in 2015. Various drums containing oil, Freon, paint wastes and tar-like material were removed from the site over the course of the MEC response actions.

In 2012, a Supplemental Resource Recovery and Conservation Act (RCRA) Facility Investigation (RFI) was conducted, to reevaluate soil and groundwater quality following the interim remedial actions completed before 2008. The RFI concluded xylenes were present in subsurface soils, and two plumes of volatile organic compounds (VOCs) existed; trichloroethene (TCE) was the primary contaminant in the westernmost plume, and xylene and TCE were the primary contaminants in the eastern plume. Regarding a figure depicting the two plumes, Ms. Adrienne Esposito (Citizens Campaign for the Environment) inquired as to the concentrations of VOCs in the plumes, and whether it extended under Swan Pond. Ms. Francisco responded, noting that the outer limits of the plumes are defined by the approximate location of VOCs in excess of their maximum contaminant levels (MCLs) (5 micrograms per liter [µg/L] for most VOC contaminants of concern, including both TCE and xylene as they relate to the figure in question) and concentrations range as high as 50 µg/L, and that TCE is believed to be in groundwater beneath the pond but it has not been identified in surface water in the pond itself.

The proposed remedy to address VOC contamination of soil and groundwater, as described in the Proposed Plan and presented as an interim remedy, was then summarized. There are several components to the remedy: land use controls (LUCs) to restrict development and groundwater use on-site until cleanup goals have been achieved, and long term monitoring of groundwater (LTM) to evaluate VOC migration and attenuation. If additional actions are warranted based on LTM data, they may include use of oxygen- or hydrogen-releasing compounds (ORC/HRC). The capital cost of the proposed remedy is estimated at $75,000, with annual costs of $42,000 to $120,000 and a 30-year total cost of $2 million. Regarding the proposed remedy, Ms. Esposito noted that this is largely a passive remedy and asked how the need for additional actions will be defined. Ms. Francisco responded, indicating that if VOCs are observed to not be attenuating or are increasing within the plume, then ORC/HRC would be used to

address remaining source areas or hotspots. Regarding a further question about the “endgame,” whether the site might reach closure and when the 30-year time horizon starts, Ms. Francisco indicated that there is reason to believe the project remedial goals will be met, allowing the site to be closed from a VOC contamination standpoint, and that the 30-year timeline begins upon signing of the Record of Decision (ROD). Mr. Racaniello asked if 30 years is the best estimate for when the cleanup might be complete; Mr. David Brayack (Tetra Tech) responded, indicating that it is will likely take less than 30 years but that the 30-year timeline was selected as it is a “typical” timeframe over which to estimate long-term costs.

The presentation then continued with a description of the proposed remedy for potential residual MEC remaining on site. This remedy consists of consolidation of off-property material, regrading and surface work to stabilize the ground surface within the MEC areas, LUCs to restrict future uses of the site, and long-term erosion and control measures to keep the stabilized surface in place. The capital cost of the MEC remedy is estimated at $2.6 million, with annual costs of $26,000 to $56,000 and a total 30-year cost of $3.6 million.

Regarding the MEC remedy, Mr. Racaniello asked if LUCs would extend off-site. Ms. Francisco responded, indicating that they would not. The red areas outside of the property line as shown on the figure depicting the MEC remedy represent “consolidation” areas, meaning that these areas (all outside of the property line) would dug down to native soil and the surficial soil would be pushed onto the Site 2 property itself, or disposed of offsite. Mr. Racaniello then asked if LUCs for the VOC remedy would extend offsite. Mr. Brayack responded, indicating that they would, but not in a conventional sense whereby restrictions would be recorded in deeds and enforced through routine inspections. In this case, the offsite property is owned primarily by the county, and the Navy would work with the county to ensure no new exposures to VOCs in groundwater are created. This would generally be the case only if a new groundwater extraction well were to be installed.

Mr. Andrew Rapiejko (SCDHS) then asked if the Navy has approached the landowners – Mr. Brayack indicated they had not – and then further asked how exposure could be prevented if there is no legal authority to implement the LUCs on off-property areas. Mr. Brayack responded, indicating that while the Navy cannot stop the county from installing a well should they want to do so in this scenario, the Navy could add wellhead treatment, or provide an alternate source of groundwater. Such potential scenarios are not part of the Proposed Plan per se, but would be elaborated upon in the Remedial Design (RD). The other alternative would be for the Navy to take the affected property, but the levels of contamination are such that this appears to be an excessive response since, while VOC levels exceed MCLs, they are not extremely high. Continuing LTM and further treatment of source areas, if needed, is the most effective response. Mr. Rapiejko indicated that the LUC component appears somewhat misleading given this understanding of what the LUCs include. Mr. Brayack elaborated, noting that the Navy can’t formally negotiate with the county without a remedy having been formally selected. Also, the controls are temporary, and can be lifted once VOC concentrations in groundwater are below MCLs. To that end, the

offsite component controls can be likened to an “administrative” LUC. Also, the off-property VOC remedy has no impact on the MEC remedy – LUCs related to the MEC remedy would be recorded on the deed at the time of any future transfer of the property.

Revisiting the potential for offsite use of groundwater, Mr. Lou Cork (RAB member) asked if the Navy would provide treatment if needed. Mr. Brayack indicated that the Navy would, should a new well be drilled. A discussion of the role of SCDHS in regulating groundwater wells followed, after Mr. Steve Karpinski (NYSDOH) asked if the county regulates drinking water wells. Mr. Doug Feldman (SCDHS) indicated that the county does review plans, but Mr. Rapiejko added that this does not necessarily mean the county can prevent a well from being installed. Ms. Jodi Giglio (Town of Riverhead) added that from a municipal perspective, the town has to allow installation of new wells if the lot exceeds a certain distance to an existing municipal water line (Mr. Feldman clarified that this distance is 150 feet), but that a sign-off on a certificate of occupancy would be dependent upon sampling of the potable water supply, including with treatment if required. Mr. Rapiejko added that once the initial approval is granted, the county has no further regulatory authority regarding quality of a private water supply, which is the concerning aspect of the “administrative” LUCs. Mr. Brayack agreed that restrictions on offsite wells are indeed difficult to enforce, but in this particular case, where only a limited number of impacted properties exist and the county is one of these owners, such an approach could be effective. Mr. Racaniello asked about the Swan Lake Golf Club, which is one of the impacted properties; Mr. Brayack confirmed that they do have an irrigation well near the clubhouse[1], but that impacts to the groundwater on the golf course are limited to one sliver where concentrations are at about 20 to 30 µg/L (as compared to the MCL of 5 µg/L). The Grumman property on the south side of Grumman Boulevard is also affected, but there will be an enforceable LUC at that location.

Conversation continued regarding the potential future installation of drinking water wells within the impacted area outside of Navy property. Ms. Giglio inquired as to whether it would be possible for the county to issue notices recommending regular testing along with certificates of occupancy, even if not enforceable. Mr. Feldman indicated that this is unlikely as the SCDHS has regulatory oversight only for public water supplies and cannot officially make recommendations outside their regulatory authority. Ms. Esposito noted that a proposal to enforce a monitoring requirement was proposed at the state level, but failed as part of the legislative process. Mr. Brayack again emphasized that the affected areas are largely not developable, which is why this approach is considered reasonable and was selected as the proposed remedy; if development of the impacted land was a reasonable scenario, this plan would not have been selected.

[1] The Swan Lake Golf Course has two irrigation wells (located about 250 feet west of the clubhouse) and a private potable water supply well (located at the clubhouse); these wells are about 2,000 feet southwest of the “sliver” of impacted groundwater referenced by Mr. Brayack.

Ms. Esposito inquired about the TCE anomaly – specifically, whether it represents a slug from an unexpected source, and if there was any soil testing. Ms. Francisco responded, indicating that a series of temporary wells were drilled around the anomaly area near FT-PZ460I and no similar concentrations of TCE in groundwater were identified, which is why this area continues to be referred to as an anomaly. No soil samples were collected as part of that investigation.

Presentation of details related to the MEC remedy then resumed. This included a presentation of a cross-section of the proposed surface work in the MEC-impacted areas, and a summary of the path forward with the public comment period on the Proposed Plan ending on May 15, 2017, preparation of a ROD and a RD for August 2017, and potential start of construction in the fall or winter of 2017/18.

Mr. Rapiejko inquired about perfluorooctane sulfonate (PFOS) detections in groundwater, and how that impacts the proposed plan. Ms. Francisco confirmed that PFOS and related compounds (collectively known as perfluorinated compounds [PFCs]) have been detected, but because these compounds are "emerging contaminants" there is regulatory uncertainty as to the requirements for a PFC remedy. Mr. Rapiejko added that a similar situation exists for 1,4-dioxane, which is likewise an emerging contaminant and has been found in several county wells, and is especially concerning because it has a 99-year half-life. Further, Mr. Rapiejko indicated that PFCs readily bioaccumulate, and so they need to be considered in the remedy, but the LUCs are addressing only VOCs; if PFCs and 1,4-dioxane still need to be addressed, why not wait until a single remedy can be proposed? Mr. McCloud responded, indicating that the primary driver for why something is being done now at the site is the MEC issue. VOCs are also being targeted since they are well-defined, and by virtue of creating a LUC the VOC remedy can be put in the Navy's tracking system immediately. The Navy understands the concerns regarding emerging contaminants and will address them, but at the same time wants to move forward on portions of the longer-term remedy that can be implemented now.

Mr. Rapiejko continued to inquire about PFCs and 1,4-dioxane, asking about how the Navy might respond if further investigation suggests that the optimum strategy for emerging contaminants is excavation, but the MEC cap is in place. Mr. Brayack responded, noting that the purpose of the interim ROD is to provide protection against currently-known and well-understood dangers, such as the VOCs and MEC, but nothing in the ROD would prevent implementing another remedy that more effectively addresses the emerging contaminants. However, the timeline for reaching such a point is several years (about two years to complete a remedial investigation and another two years for a feasibility study), so it will be years before there is another opportunity to implement a remedy. The MEC remedy is essentially grading and seeding, and is not an impediment to future actions. Mr. Rapiejko indicated that he understood this approach for soil, but groundwater remains an issue.

Ms. Esposito added, specific to 1,4-dioxane, that the current MCL of 50 µg/L will be changing; if the Environmental Protection Agency (EPA) does not issue a federal MCL the state is likely to do so, so the

remedy will need to evolve. Mr. Brayack indicated that more information regarding both the PFCs and 1,4-dioxane is likely to become known later in the year, as more sampling is planned to define the affected area but until standards are established the process can move forward only so far; more emerging contaminants will be forthcoming, but we have to be protective for the issues we know about and that the Five-Year Reviews will ensure that any new emerging contaminants are investigated as appropriate in the future. Regarding issuance of new MCLs by the state, Mr. Feldman asked Mr. Karpinski if there are any updates he could convey regarding the process. Mr. Karpinski indicated there is nothing known so far. Ms. Esposito commented that it is a political process and an advisory committee is being put together. Mr. Karpinski noted that he is waiting to hear details on how the process will proceed, but that a lot is involved in promulgating new MCLs.

Regarding PFCs, Mr. Rapiejko inquired about the one known potable supply well potentially downgradient of Site 2, and if something can be done in the meantime while standards are established. Mr. McCloud responded, noting that monitoring was taking place quarterly, and if PFC concentrations exceeded the current EPA drinking water health advisories (DWHAs), the Navy would take immediate action.

TECHNICAL PROGRESS – FENCE-LINE TREATMENT SYSTEM UPDATE

Mr. Patrick Schauble (KOMAN Government Solutions) introduced himself to the attendees, noting that oversight of the operation and maintenance of the Fence Line Treatment System (FLTS) was being transitioned due to changes in personnel and that Mr. Stephane Roy (KOMAN Government Solutions, also present at the meeting) would be taking over day-to-day responsibilities. Mr. Schauble then provided an update on the operation of the FLTS. The presentation is included in Attachment 3. The FLTS was constructed pursuant to a ROD for Site 6A/10B (also known as Operable Unit 3 [OU3]) that was completed in May 2012. The selected remedy calls for LUCs and a system to extract, treat and infiltrate groundwater in order to achieve the remedial goal of containing the spread of a plume of VOCs leaving the site in groundwater.

The FLTS system employs two extraction wells, air stripping equipment, and two infiltration galleries in order to control the VOC plume. Construction started in October 2012 and was completed in October 2013, and system start-up occurred on October 8, 2013. In order to address declining productivity, extraction well EW-2, which was installed as part of the original FLTS, was taken off-line and replacement well EW-3 was brought on-line in February 2016.

Operating statistics and sampling data were then presented, covering a 41-month period from system startup through February 2017. System uptime and flow rates were lower in the first four months due to issues associated with system startup; following the initial shakeout period, average influent flowrates exceeded 78 gallons per minute (gpm) over the next year. The system operated at a reduced rate beginning in March 2015, initially due to a seasonally-elevated groundwater table and subsequently due

to reduced output from extraction well EW-2. More recently, influent flowrates were decreased to below 70 gpm because of issues with the infiltration galleries, which have limited system throughput.

Influent contaminant concentration trends were then presented. Generally, a downward trend has been observed since the system began operation. Based on the influent data, it is estimated that the system is currently removing less than a tenth of a pound of VOCs on a monthly basis, and the cumulative removal through February 2017 was estimated at 50.03 pounds. Target VOC concentrations have decreased to below 5 µg/L. In order to evaluate the presence of VOCs other than those included in the site ROD, analysis of influent for the full list of VOCs began in May 2016; perchloroethylene (PCE) concentrations have ranged as high as 8.9 µg/L.

As noted previously, throughput had recently been reduced due to issues with infiltration gallery capacity. A letter work plan to perform chemical redevelopment of the infiltration galleries was approved in September 2016, and consisted of weekly injections of sodium bisulfate. Test pits to investigate subsurface conditions near the infiltration galleries were planned, and evaluation of alternatives to resume higher throughputs would continue.

The FLTS maintains continued compliance with all discharge goals, including effluent levels less than the relevant NYSDOH MCLs, and VOC removal efficiency is in excess of 99 percent. An inquiry as to when the FLTS might be shutdown was made; Mr. Robert Forstner (Resolution Consultants) responded, indicating that because Fence Line Area monitoring wells indicate VOC concentrations in excess of 50 µg/L in some locations, shutdown is likely still at least a couple of years off.

TECHNICAL PROGRESS –SITE 7 REMEDIAL ACTION UPDATE

Mr. Schauble then continued with an update on the status of Site 7 (the former Fuel Depot). The presentation is included in Attachment 3. A summary of the site history was provided first, noting that an AS/SVE system started operation on a pilot scale in 2005 and at full scale in 2006, and was operated seasonally (April to December) through November 2013. Modifications were made over time to improve performance, but the system reached the end of its functional life, with a major blower overhaul required to continue operation. The system was shut down in November 2013 and routine monitoring began according to the “Performance and Shutdown Evaluation” plan.

A summary of the historic underground storage tank (UST) areas, the layout of injection, monitoring and extraction wells, and system performance was then shown, including a figure depicting the extent of the contaminant plume shrinking over time. Routine sampling activities conducted since system shutdown (including quarterly sampling of seven wells) were then summarized, and contaminant trends were shown. It was noted that four downgradient sentinel wells were added to the network beginning in September 2015, and that groundwater sampling was done on a quarterly basis through December 2015 and on a semi-annual basis beginning March 2016. Groundwater monitoring data was then summarized,

including trend charts showing concentrations over time of the contaminants of concern at the seven locations included in the routine monitoring program.

Regarding recent activities, Mr. Schauble noted that free product was observed in MW-17S during the semiannual groundwater sampling event in October 2016. At that point, routine gauging of several Site 7 wells began, and free product was bailed when and where observed. The thickness of the free product layer was approximately 1.12 feet when first observed at MW-17S in October 2016; over time, the thickness of this layer decreased to 0.14 feet by February 2017 and 0.21 feet in March 2017. Free product was also observed at a thickness of 1.05 feet at MW-19S beginning in November 2017, then not encountered by February and March of 2017. Similarly, 0.60 feet of free product was observed in MW-16S in January 2017, but none was encountered in February or March of 2017.

Mr. Forstner then discussed a subsurface investigation of the free product observations that was conducted in March 2017 as an add-on to the Site 6A temporary well program. Four borings were completed in this area, one penetrating the buried slab beneath the former USTs and three borings completed around the apparent edge of the buried slab. No free product was observed at that time, consistent with contemporaneous observations at the permanent monitoring wells. However, staining, odors and PID peaks were observed to a depth of about five feet below the buried slab. These results and observations are to be summarized in a report that will also evaluate treatment options that might be relevant to the site, considering the impact of the buried slab and the difficulty in penetrating this obstacle.

TECHNICAL PROGRESS – 2016 GROUNDWATER INVESTIGATION

Mr. Forstner then provided a presentation on the results of the 2016 sampling events. The presentation is included in Attachment 3. The main sampling event in 2016 was a continuation of the annual basewide program begun in 2011, and included surface water and groundwater sampling at four locations along the Peconic River in May and September, and a full round of groundwater sampling at 74 locations (including the four Peconic River piezometers) in September. Groundwater samples were collected from locations at Site 2 (15 locations on-property and eight locations off-property), Site 6A/10B (12 locations) and the Southern Area (21 locations onsite and 17 locations offsite, including seven offsite locations in the Peconic River area).

All samples (groundwater, surface water and sediment) were analyzed for VOCs; three groundwater samples were also analyzed for iron, manganese and arsenic in the September sampling event. Additional samples were also collected during the September event for analysis of PFOS and perfluorooctanoic acid (PFOA) – specifically, samples were analyzed for PFOS/PFOA concentrations seven Site 2 locations (five located on-property and two off-property) and four OU3 locations (two at Site 6A and two in the Southern Area). Finally, additional samples to monitor VOC concentrations in the Fence Line Area were collected in May and December 2016.

For the results maps shown in the presentation and the accompanying detail maps, the abbreviation “ND” was employed to indicate that a given compound (or VOCs as a group, if appropriate) was not detected. Bolded results indicate that a compound exceeded a relevant standard (primarily, the NYSDOH MCLs, OU3 RD benchmarks, or PFOS/PFOA DWHAs). Detections of the primary site contaminants (e.g., 1,1-dichloroethane [DCA] and 1,1,1-trichloroethane [TCA]) were identified on the maps regardless of concentration relative to the standards. The abbreviation “NX” was used to denote samples where at least one VOC other than a primary site contaminant was detected, but that such detection(s) did not exceed a relevant standard.

Mr. Forstner first reviewed figures showing the flow of groundwater and analytical results for Site 2. Generalized groundwater flow data for Site 2 indicate flow is to the southeast, consistent with previous observations. Groundwater elevations at Site 2 in September 2016 were generally about three-quarters of a foot to a foot lower than the September 2015 observations.

Regarding groundwater quality, DCA was found just above the MCL at FT-MW03S, and slightly reduced from the concentration detected in 2015, which may be suggestive of much higher levels of DCA and TCA observed in 2014 being connected to the disturbance and removal of drums from this general area during a prior MEC removal action. Concentrations of DCA and TCA were detected at several multiples of the MCLs at FT-MW09I (downgradient of the drum removal area), but a downward trend was evident. TCE was detected below the MCL, after exceeding it in 2015.

Discussion then moved to the off-property area, particularly the area south and east of Swan Pond, where TCE has consistently exceeded its MCL at three locations. Of particular note was FT-PZ460I, where a concentration of 150 µg/L was detected, consistent with an “anomaly” that has been seen at this location since it was first sampled in February 2012. DCA and 1,1-dichloroethene (DCE) also exceeded MCLs at this location. TCE also exceeded MCL at FT-PZ458I and 462I. Overall, the data indicates the TCE anomaly appears to be decreasing in intensity, though it remains an item to be monitored going forward.

Regarding PFOS/PFOA results at the residential well downgradient of Site 2, PFOS was detected at about 10 percent of the DWHA and PFOA was not detected in September 2016. Neither compound was detected in December 2016. Elsewhere in the Site 2 network, PFOS/PFOA were detected in all 5 on-property wells samples, and DWHAs were exceeded at three of these locations (FT-MW02S, 08S and 08I). PFOS exceeded the DWHA at one off-property location (FT-PZ456S) and was not detected in the other (FT-PZ456I). PFOA was detected at FT-PZ456I but did not exceed the DWHA, and was not detected at FT-PZ456S.

Mr. Forstner then moved on to figures showing results at Sites 6A/10B and the Southern Area. First, a figure summarizing the overall contaminant plume extending from Sites 6A/10B and the subareas it is divided into for discussion purposes was shown for orientation purposes. Similar to the groundwater flow data for Site 2, groundwater at Sites 6A/10B and the Southern Area generally flows to the southeast.

Water levels to the northeast were found to be approximately one-half foot lower in elevation in 2016 than in 2015, but water levels closer to the Peconic River were generally similar to those observed in 2015. The review of the groundwater chemistry data then proceeded by subarea:

- **Source Area (Sites 6A/10B):** There was a continued increase in concentrations of several VOCs at FC-MW03SR1 in 2016 (where seven compounds exceeded their MCLs). Groundwater results in this area were otherwise generally consistent with results from 2015. Further downgradient, concentrations at the mass flux "fenceline" near the well clusters FC-MW05, FC-MW09 and FC-MW10, across which the mass flux of VOCs moving downgradient from the source area is measured, were all below MCLs. The total mass flux is currently estimated at 0.2 pounds/year of VOCs, below the benchmark to consider additional source area treatment. An investigation of continued elevated VOC concentrations in the source area though a temporary well installation program was recently completed, and results are expected in May 2017. Finally, PFOS and PFOA were analyzed at two locations (FC-MW02SR1 and 02IR1), and concentrations in excess of the DWHAs were observed at FC-MW02R1.
- **Fence-Line Area:** The trend in this area has been towards decreasing concentrations of VOCs over the past several years at most locations, particularly in areas further upgradient (e.g., DCA concentrations at SA-PZ157I1 have decreased from 550 µg/L in 2012 to 240 µg/L in 2013, 130 µg/L in 2014, and not detected in 2015 or September 2016, though there was a detection of 1.4 µg/L in May 2016). In May 2016, VOCs exceeded FLTS shutdown criteria at three wells (SA-MW127I, SA-PZ135I and SA-PZ180I); in September, only one location (SA-MW127I) exceeded the shutdown criteria. In the downgradient areas closer to the FLTS, concentrations of several times the MCL for DCA continue to be found. This data is thought to be indicative of the remaining plume of VOCs having decreased in width to the point where it is observed only intermittently by the well/piezometer network and at other times the plume may be "threading" through the well network in this area. In addition, PCE levels over the MCL observed at SA-PZ149I1 and 157I1 in September 2015 and again in May 2016 appear to be decreasing and were below the MCL in September 2016, but concentrations exceeding the MCL were observed further downgradient at SA-PZ179I in May and September 2016; it is not known if this is related to Navy use of the site. Regarding the persistent elevated VOC levels at SA-MW127I, it is thought that this might indicated an area of stagnated groundwater that is caught between the infiltration galleries and the extraction wells, and an existing pump test well adjacent to SA-MW127I will be temporarily connected to the FLTS to attempt to address this area. Regarding PFOS/PFOA, both compounds were detected in the two samples analyzed in the Fence Line Area (SA-PZ181I and 182I), and the PFOA DWHA was exceeded at both locations.
- **Offsite High Concentration Area:** Concentrations of VOCs (and DCA in particular) continue to exceed MCLs at four of five locations in this area (SA-PZ142I, 143I, 145I and 145D). The highest concentrations were observed at SA-PZ143I, which is furthest downgradient along the historic

plume path; in September, detections included DCA at 280 µg/L, TCA at 46 µg/L, chloroethane (CA) at 42 µg/L and DCE at 26 µg/L. Over time, concentrations of DCA and DCE appear to be decreasing in the Offsite High Concentration Area.

- **Offsite Low Concentration Area:** Elevated concentrations of VOCs continue to be detected throughout this area. DCA is the most common, exceeding the MCL at six locations; TCA, DCE and CA also exceeded MCLs at SA-PZ171I, which was the only location in this area where more than one MCL was exceeded. Elevated VOC concentrations that had previously been observed at the SA-MW132S/I cluster since at least 2013 (with DCA levels ranging from 740 µg/L in September 2013 to 400 µg/L in September 2015) appear to have largely dissipated; DCA at SA-MW132S was the only exceedance of an MCL (at 8.0 µg/L) at this cluster and all results at SA-MW132I were below MCLs or non-detect. These results may be indicative of a shift in the plume as opposed to true dissipation of the VOC inventory, and additional wells recently installed to the east on Peconic River Sportsman's Club property and scheduled to be sampled in spring 2017 will provide further data in this area.
- **Peconic River Area:** No VOCs exceeded OU3 RD benchmarks in this area in groundwater, though DCA was in excess of half of the benchmark at SA-PZ166I in September. DCA was detected in Peconic River bank porewater, at SA-PZ124 in May and September, but overall no VOCs exceeded a benchmark. In surface water, DCA was observed in May and September at SA-SW124 and in May only at SA-SW201 and SA-SW204; all detections were below RD benchmarks, and consistent with previous seasonal variations.

Regarding the temporary well program at Site 6A, Mr. Rapiejko asked if soil profiling was completed. Mr. Forstner responded, indicating that vertical profile borings were completed at five of the twelve temporary well locations. Mr. Brayack noted that this area was the site of a large excavation effort, and was also the area where Northrop Grumman had operated a free-product recovery system.

Regarding the temporary connection of the FLTS to a pump test well in the vicinity of SA-MW127I, Mr. Rapiejko asked if it the temporary well was screened in the proper interval. Mr. Brayack responded, indicating that this well was screened from 30 to 50 feet below grade and is in the proper elevation horizon; he further noted that this test well was considered for conversion to an extraction well during the design of the FLTS, but that this was not considered an optimal location for an extraction well based on the overall plume location at that time.

GENERAL DISCUSSION AND CLOSING REMARKS

At the conclusion of the meeting, an opportunity to ask general questions about the site was provided. Mr. Tim Gannon (Riverhead News-Review) asked if land for the proposed perimeter bike path would be conveyed to the town. Mr. McCloud responded, indicating that formal turnover of the land would not occur in the near-term but that the Navy was working with the Town to issue an easement for the bike path.

No further questions were posed. Mr. McCloud thanked the attendees for their participation. The next RAB meeting was planned for fall 2017, with a final date and location to be confirmed. The meeting was then adjourned.

LIST OF ACRONYMS AND ABBREVIATIONS

AS/SVE	Air Sparge/Soil Vapor Extraction
CA	Chloroethane
DCA	1,1-Dichloroethane
DCE	1,1-Dichloroethene
DWHA	Drinking Water Health Advisory
EPA	Environmental Protection Agency
FLTS	Fence Line Treatment System
HRC	Hydrogen Releasing Compound
LTM	Long Term Monitoring
LUC	Land Use Control
MCL	Maximum Contaminant Level
MEC	Munitions and Explosives of Concern
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORC	Oxygen Releasing Compound
OU	Operable Unit
PCE	Perchloroethylene (Tetrachloroethylene)
PFC	Perfluorinated Compound
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFI	RCRA Facility Investigation
ROD	Record of Decision
SCDHS	Suffolk County Department of Health Services
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
µg/L	Micrograms per Liter
UST	Underground Storage Tank
VOC	Volatile Organic Compound

ATTACHMENT 1

APRIL 4, 2017 RAB MEETING SIGN-IN SHEET

46th RAB Meeting for NWIRP Calverton
April 4, 2017
Sign-in List

Name (Print)	Address and/or email if interested in being on mailing list	Affiliation	How did you hear about the meeting?
Dave Brgicc K			
Lou Cook			
Andy Fielenz			
Andy Rapiejko			
Doug Feldman			
Adrienne Esposito			
Henry Wilkie			
Vinnie Racaniello			
Steve Karpinski			
Robert Forstner			
Judi Caiglio			
Joe Mecouns			
Steve Shapiro			
Paul Martorano			
Drew Dillingham			

Also attending, but did not sign in:

Kristi Francisco, Tetra Tech
Tim Gannon, Riverhead Times-Review
Stephane Roy, KOMAN Government Solutions
Patrick Schauble, KOMAN Government Solutions
Michael Zobel, Resolution Consultants

ATTACHMENT 2

APRIL 4, 2017 RAB MEETING AGENDA

Agenda

Restoration Advisory Board
Naval Weapons Industrial Reserve Plant Calverton

April 4, 2017
Calverton Community Center, Calverton NY
7:00 p.m.

Welcome and Agenda Review
Joseph McCloud, NAVFAC Mid-Atlantic

Distribution of Minutes
All Members

Community Update
Vincent Racaniello, RAB Co-chair

Technical Progress

General Overview of ER Sites
Joseph McCloud, NAVFAC Mid-Atlantic

Site 2 Proposed Plan
Kristi Francisco, Tetra Tech

Fence Line Treatment System Update
Stephane Roy, KOMAN Government Solutions
Patrick Schauble, KOMAN Government Solutions

Site 7 Remedial Action Update
Stephane Roy, KOMAN Government Solutions
Patrick Schauble, KOMAN Government Solutions
Robert Forstner PE, Resolution Consultants

2016 Groundwater Investigation Summary
Robert Forstner PE, Resolution Consultants

Closing Remarks
Joseph McCloud, NAVFAC Mid-Atlantic

Presenters will be available after the program for questions.

ATTACHMENT 3

NAVY PRESENTATIONS – APRIL 4, 2017 RAB MEETING

RESTORATION ADVISORY BOARD MEETING

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP) CALVERTON, NEW YORK

April 4, 2017

General Overview of ER Sites

- **Sitewide**
  - 2016 sampling events completed in May and September
- **Site 2**
  - Proposed Plan issued March 2017; comment period open through May 15, 2017
  - PFAS sampling completed in September 2016
- **Site 6A/10B/Southern Area**
  - Fence-line system construction completed and online October 2013
    - Replacement extraction well installed and online as of March 2016
  - Operable Unit 3 (OU3) Record of Decision (ROD) and Remedial Design completed
  - Source Area investigation field work complete; results pending
- **Site 7**
  - AS/SVE system shutdown after 2013 operating season; monitoring ongoing
  - Evaluation of free product layer and impact on planned action ongoing

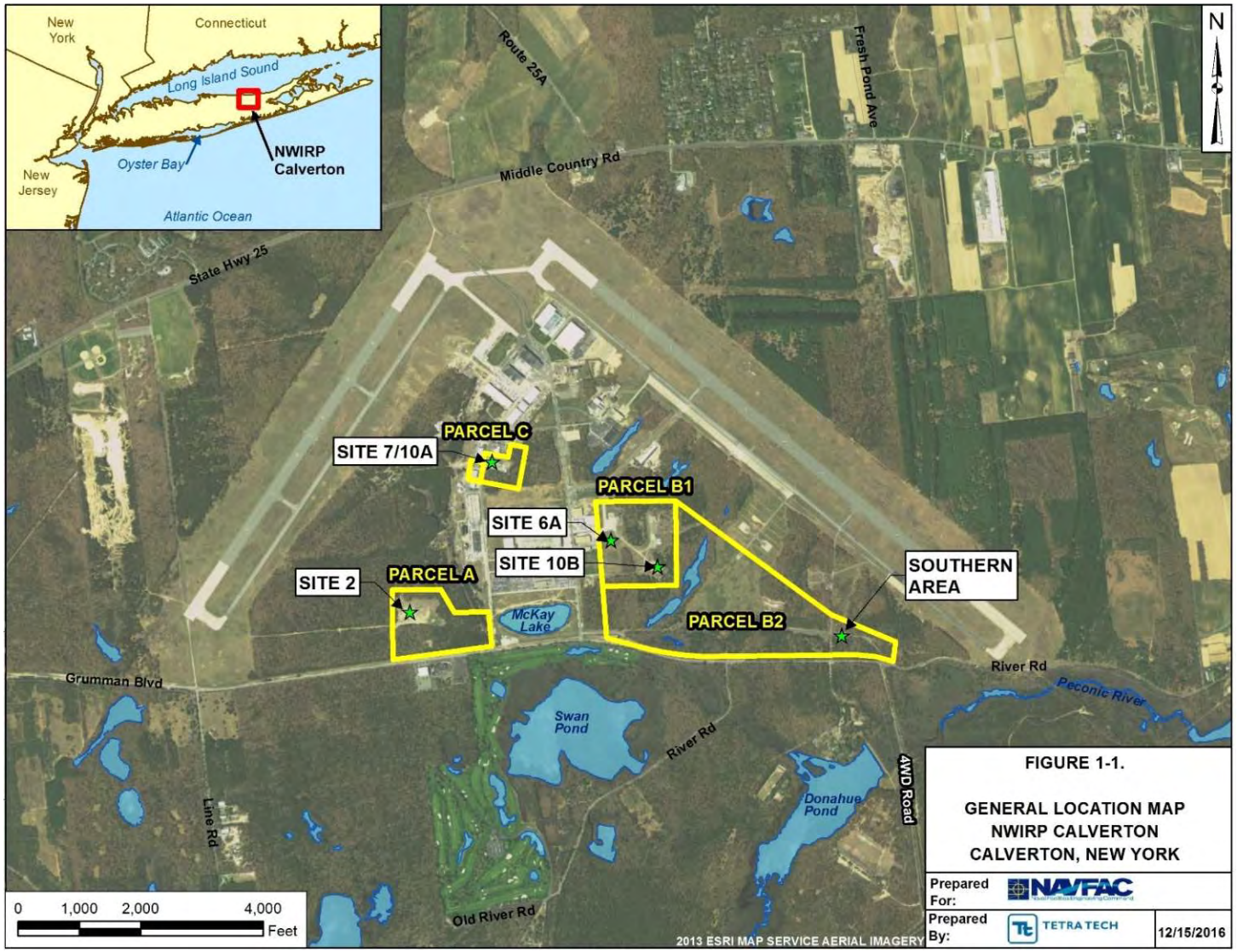
SITE 2 (FIRE TRAINING AREA) PROPOSED PLAN

April 2017 Restoration Advisory Board

NWIRP CALVERTON, NEW YORK

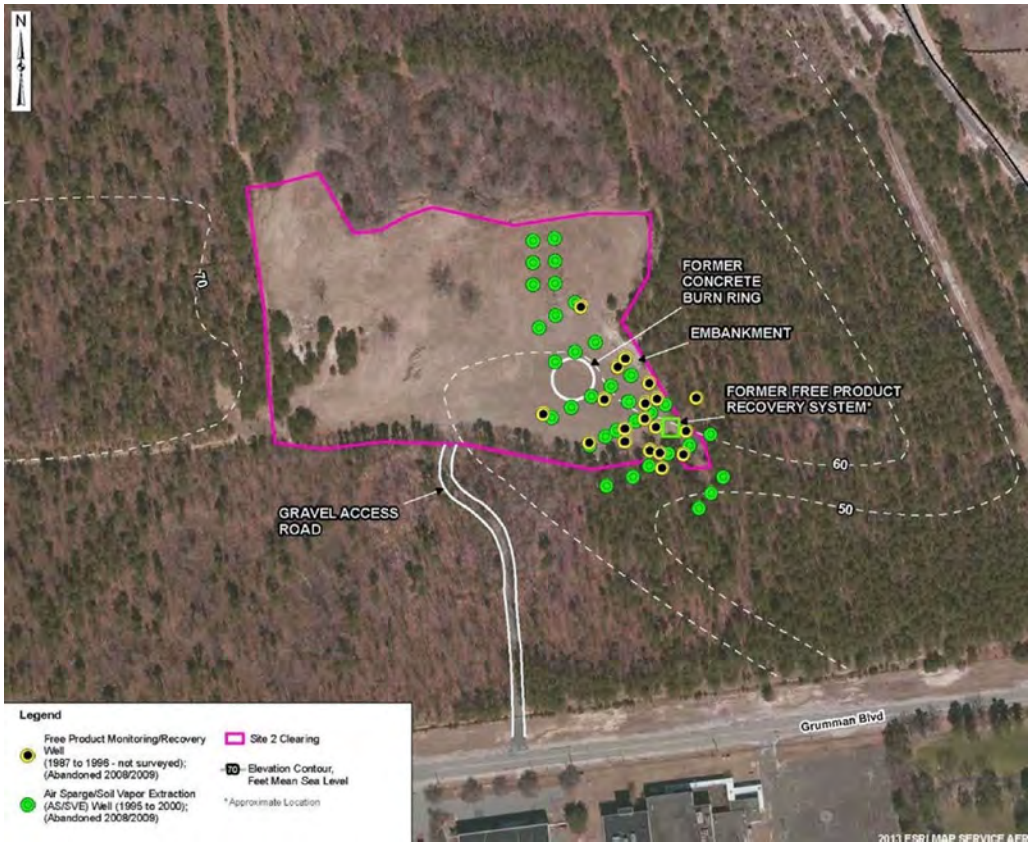
April 4, 2017

Site Location



Site 2 - History

- Site 2 is located on the remaining 211 acres retained by the Navy to continue Environmental Restoration Program activities
- Site 2 was used as an active Fire Training Area from the 1950's until 1996
- As a result of fire training activities, soil and groundwater at the site have been impacted by petroleum, chlorinated solvents, and other chemicals
- Potential Residual Munitions and Explosives of Concern (MEC) are present and likely originated at another location at the NWIRP (cannon test area)



Former Site Layout and Initial Response Actions (Pre-2008)

Site 2 – Current Conditions (Sept. 2016)

Site 2 – 10.5-acre Clearing, looking west northwest

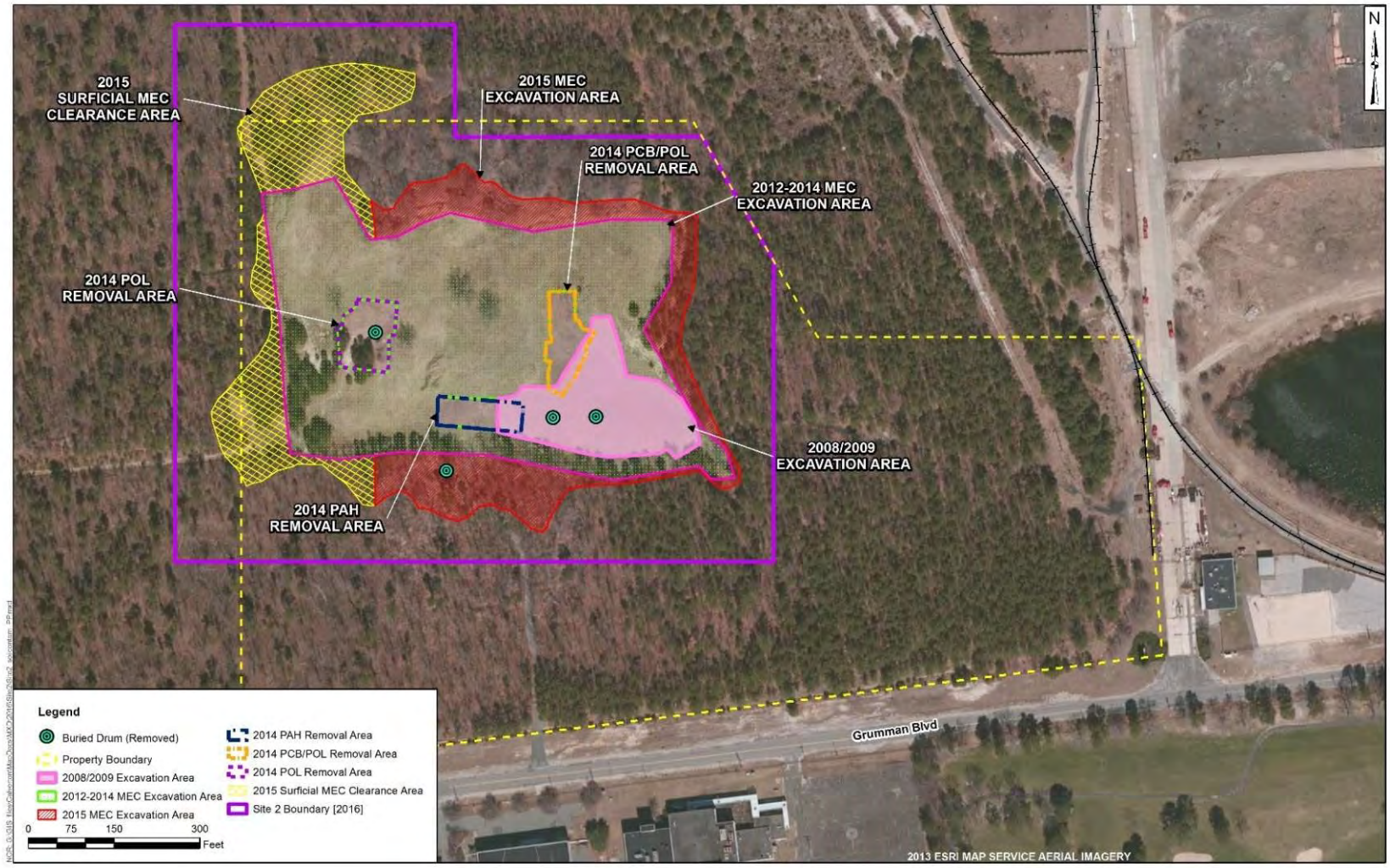
Site 2 –Response Activities (1986 to 2009)

- **Remedial Site Activities**
  - 1986 – 2011: Initial investigations and evaluations
  - 1987: Contaminated soil removal from 1982 and 1983 waste oil spills
  - 1987 – 1996: Groundwater recovery/oil-water separation system recovered approximately 325 gallons of petroleum product; 1,000 gallon tank removed in 1996
  - 1995 – 2000: Air Sparge/Soil Vapor Extraction (AS/SVE) operation
    - 54 pounds of chlorinated volatile organic compounds removed from the Site
    - Up to 63,000 pounds of organics may have been destroyed via bio-degradation
  - 2008/2009: Non Time Critical Removal Action (NTCRA) for shallow petroleum-contaminated soil
    - AS/SVE system and concrete burn ring removed from the Site
    - 10,860 tons of petroleum-contaminated soil excavated and disposed off-site
    - 546 tons of surficial coal were excavated and disposed off-site
    - Several crushed drums (non-hazardous contents) were encountered and disposed off-site
  - Site 2 groundwater is monitored on an annual basis

Site 2 –Response Activities (2012 to 2015)

- **Remedial Site Activities**
  - 2012 – 2014: Removal and MEC response activities:
    - Mechanical soil excavation, screening, and backfill of 6.9 acres to a minimum of 18 inches below ground surface (bgs)
    - Approximately 19,200 MEC-related items (primarily 20 millimeter projectiles/fragments) were recovered, destroyed or disposed off-site
    - Excavation of polynuclear aromatic hydrocarbon (PAH)- and polychlorinated biphenyl (PCB)-impacted soils identified during the 2008/2009 NTCRA and MEC-impacted soil excavation/screening
    - During excavation activities, several crushed drums containing oil, Freon, and paint wastes were encountered and disposed off-site
  - 2015: MEC response activities (additional 3.6 acres):
    - Mechanical soil excavation, MEC screening, and backfill of 1.8 acres to a minimum of 18 inches bgs
    - Surface clearing for MEC conducted on 1.8 acres
    - During excavation several crushed drums containing tar-like material were encountered and disposed off-site

Site 2 –Response Activities (2012 to 2015)

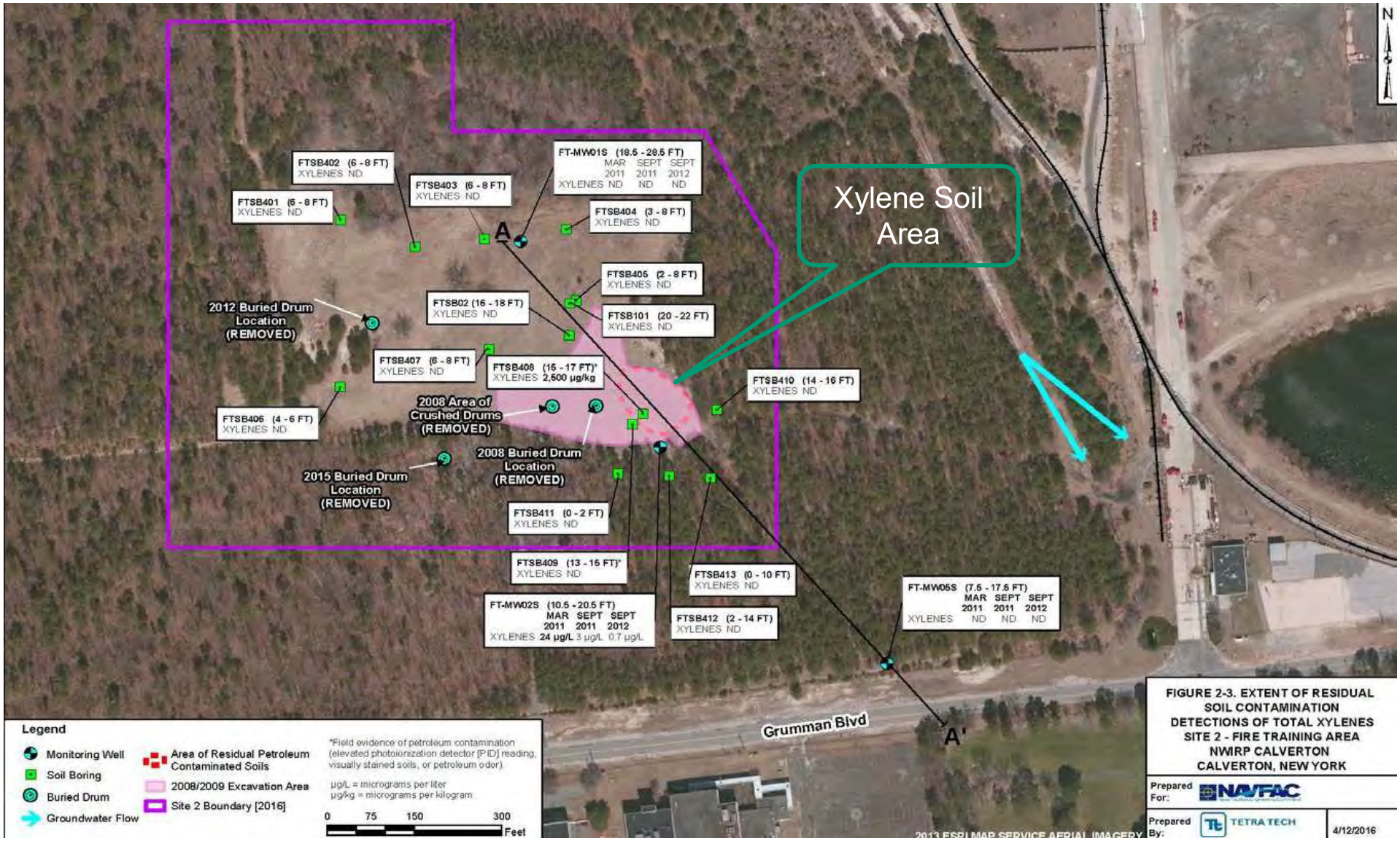


Soil and MEC Removal Actions

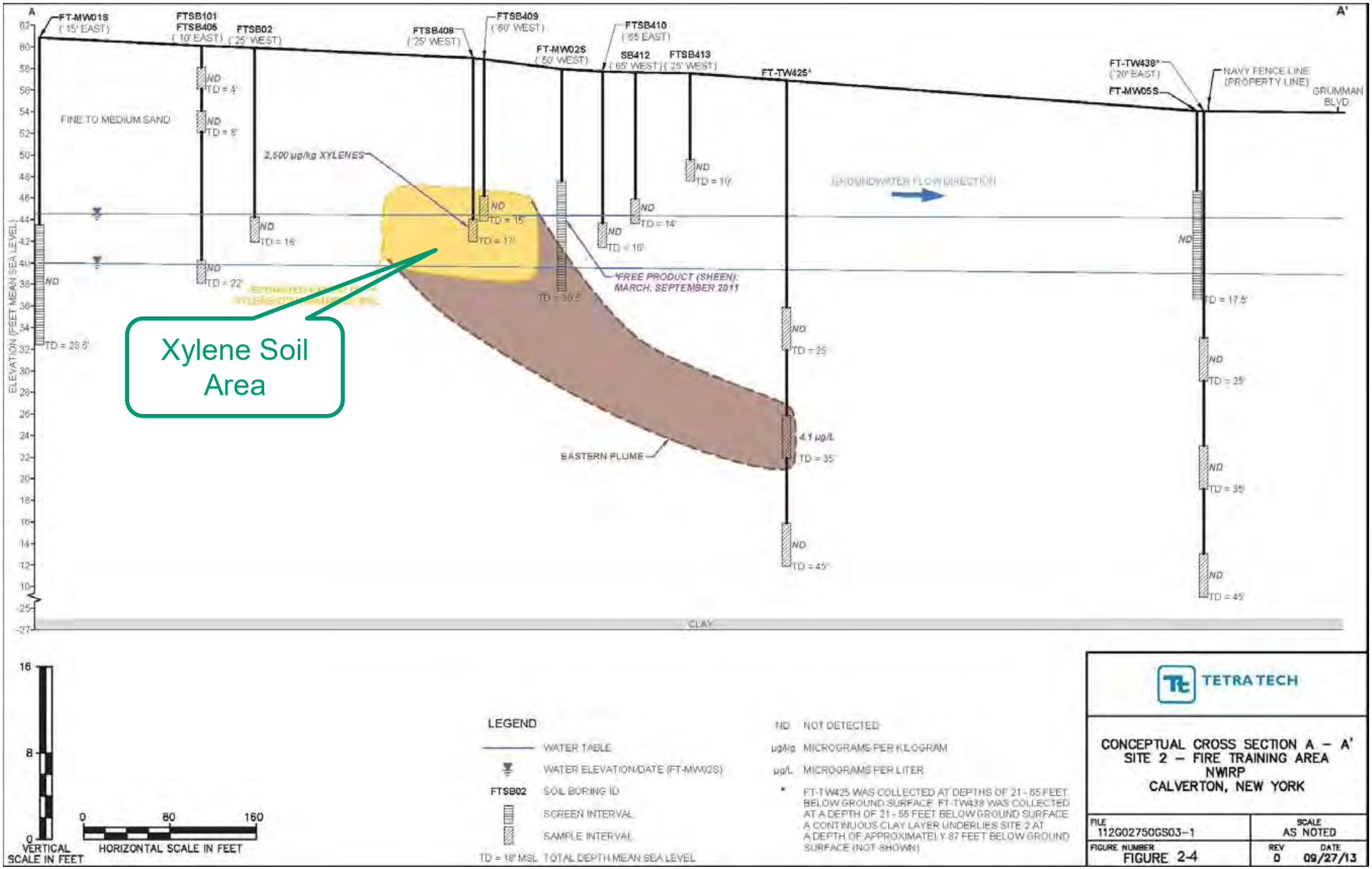
Site 2 —Environmental Concerns

- **Media and chemicals:**
  - Soil: Xylenes in subsurface soil (deep localized area)
  - Groundwater: Two volatile organic compound (VOC)-contaminated groundwater plumes appear to exist; Trichloroethene and xylene are the primary contaminants in the groundwater plumes
  - Residual MEC is potentially present on approximately 10.5 acres of the site

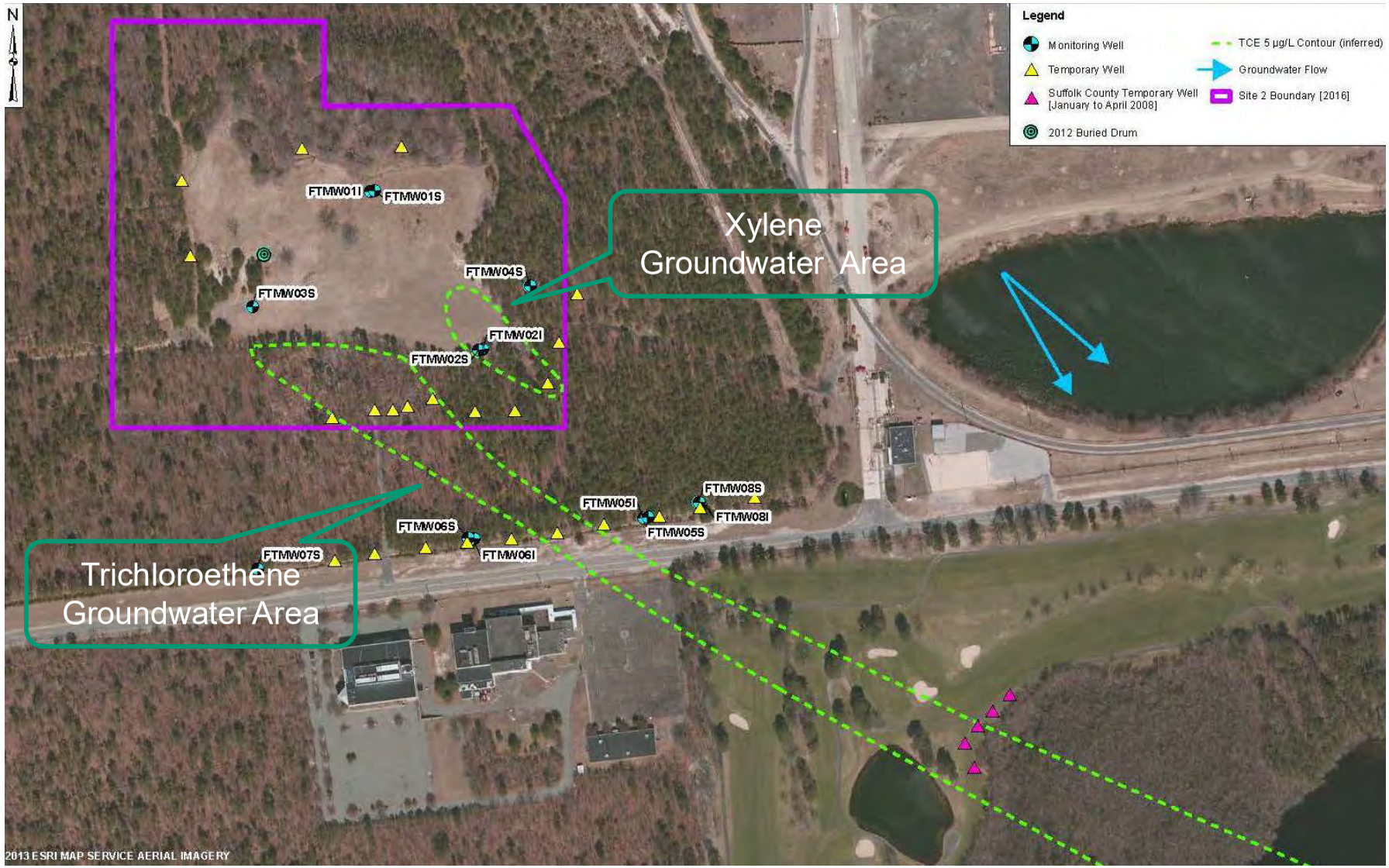
Site 2 —Soil


Xylene Soil Area
FTSB402 (6 - 8 FT) XYLENES ND
FTSB403 (6 - 8 FT) XYLENES ND
FTSB401 (6 - 8 FT) XYLENES ND
FT-MW01S (18.5 - 28.5 FT) MAR 2011 SEPT 2011 SEPT 2012 XYLENES ND ND ND
FTSB404 (3 - 8 FT) XYLENES ND
A
FTSB405 (2 - 8 FT) XYLENES ND
FTSB102 (16 - 18 FT) XYLENES ND
FTSB101 (20 - 22 FT) XYLENES ND
2012 Buried Drum Location (REMOVED)
FTSB407 (6 - 8 FT) XYLENES ND
FTSB408 (15 - 17 FT)* XYLENES 2,500 µg/kg
FTSB410 (14 - 16 FT) XYLENES ND
FTSB406 (4 - 6 FT) XYLENES ND
2008 Area of Crushed Drums (REMOVED)
2008 Buried Drum Location (REMOVED)
2015 Buried Drum Location (REMOVED)
FTSB411 (0 - 2 FT) XYLENES ND
FTSB409 (13 - 15 FT)* XYLENES ND
FTSB413 (0 - 10 FT) XYLENES ND
FT-MW05S (7.5 - 17.5 FT) MAR 2011 SEPT 2011 SEPT 2012 XYLENES ND ND ND
FT-MW02S (10.5 - 20.5 FT) MAR 2011 SEPT 2011 SEPT 2012 XYLENES 24 µg/L 3 µg/L 0.7 µg/L
FTSB412 (2 - 14 FT) XYLENES ND
Grumman Blvd
A'
N
Legend
Monitoring Well
Soil Boring
Buried Drum
Groundwater Flow
Area of Residual Petroleum Contaminated Soils
2008/2009 Excavation Area
Site 2 Boundary [2016]
*Field evidence of petroleum contamination (elevated photoionization detector [PID] reading, visually stained soils, or petroleum odor).
µg/L = micrograms per liter
µg/kg = micrograms per kilogram
0 75 150 300 Feet
2013 ESRI MAP SERVICE AERIAL IMAGERY
FIGURE 2-3. EXTENT OF RESIDUAL SOIL CONTAMINATION DETECTIONS OF TOTAL XYLENES SITE 2 - FIRE TRAINING AREA NWIRP CALVERTON CALVERTON, NEW YORK
Prepared For: NAVFAC
Prepared By: TETRA TECH
4/12/2016

Site 2 —Soil

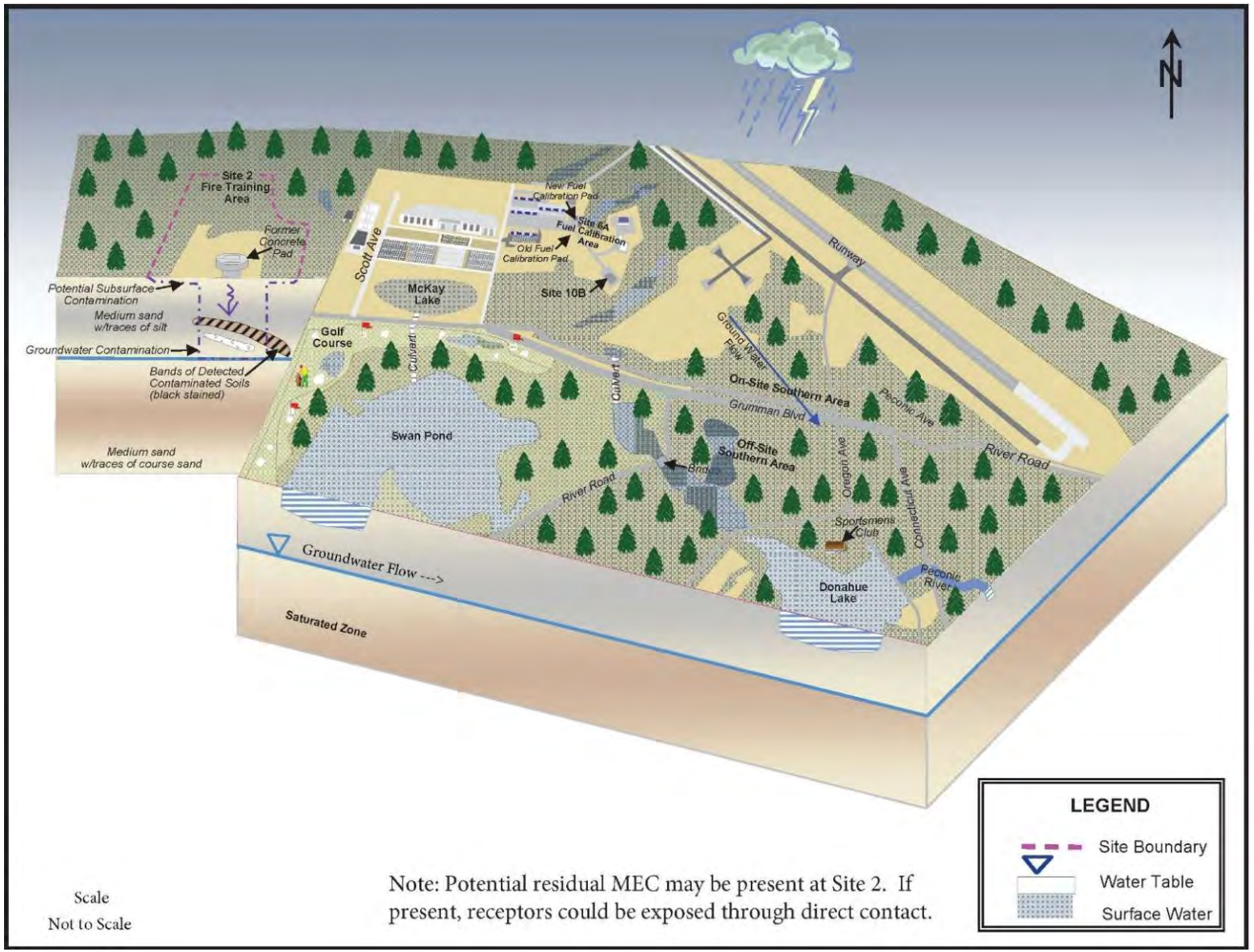

A
A'
FT-MW01S (15' EAST)
FTSB101
FTSB405 (10' EAST)
FTSB02 (25' WEST)
FTSB408 (25' WEST)
FTSB409 (60' WEST)
FT-MW02S (50' WEST)
FTSB410 (65 EAST)
SB412 (65' WEST)
FTSB413 (25' WEST)
FT-TW425*
FT-TW439* (20' EAST)
FT-MW05S
NAVY FENCE LINE (PROPERTY LINE)
GRUMMAN BLVD
FINE TO MEDIUM SAND
2,500 µg/kg XYLENES
GROUNDWATER FLOW DIRECTION
FREE PRODUCT (SHEEN): MARCH, SEPTEMBER 2011
Xylene Soil Area
EASTERN PLUME
4.1 µg/L
CLAY
ELEVATION (FEET MEAN SEA LEVEL)
VERTICAL SCALE IN FEET
HORIZONTAL SCALE IN FEET
LEGEND
WATER TABLE
WATER ELEVATION/DATE (FT-MW02S)
FTSB02 SOIL BORING ID
SCREEN INTERVAL
SAMPLE INTERVAL
TD = 18' MSL TOTAL DEPTH MEAN SEA LEVEL
ND NOT DETECTED
µg/kg MICROGRAMS PER KILOGRAM
µg/L MICROGRAMS PER LITER
* FT-TW425 WAS COLLECTED AT DEPTHS OF 21 - 55 FEET BELOW GROUND SURFACE. FT-TW439 WAS COLLECTED AT A DEPTH OF 21 - 55 FEET BELOW GROUND SURFACE. A CONTINUOUS CLAY LAYER UNDERLIES SITE 2 AT A DEPTH OF APPROXIMATELY 87 FEET BELOW GROUND SURFACE (NOT SHOWN)
TETRA TECH
CONCEPTUAL CROSS SECTION A – A'
SITE 2 – FIRE TRAINING AREA
NWIRP
CALVERTON, NEW YORK
FILE 112G02750GS03-1
SCALE AS NOTED
FIGURE NUMBER FIGURE 2-4
REV 0
DATE 09/27/13

Site 2 – Groundwater



Site 2 —Groundwater

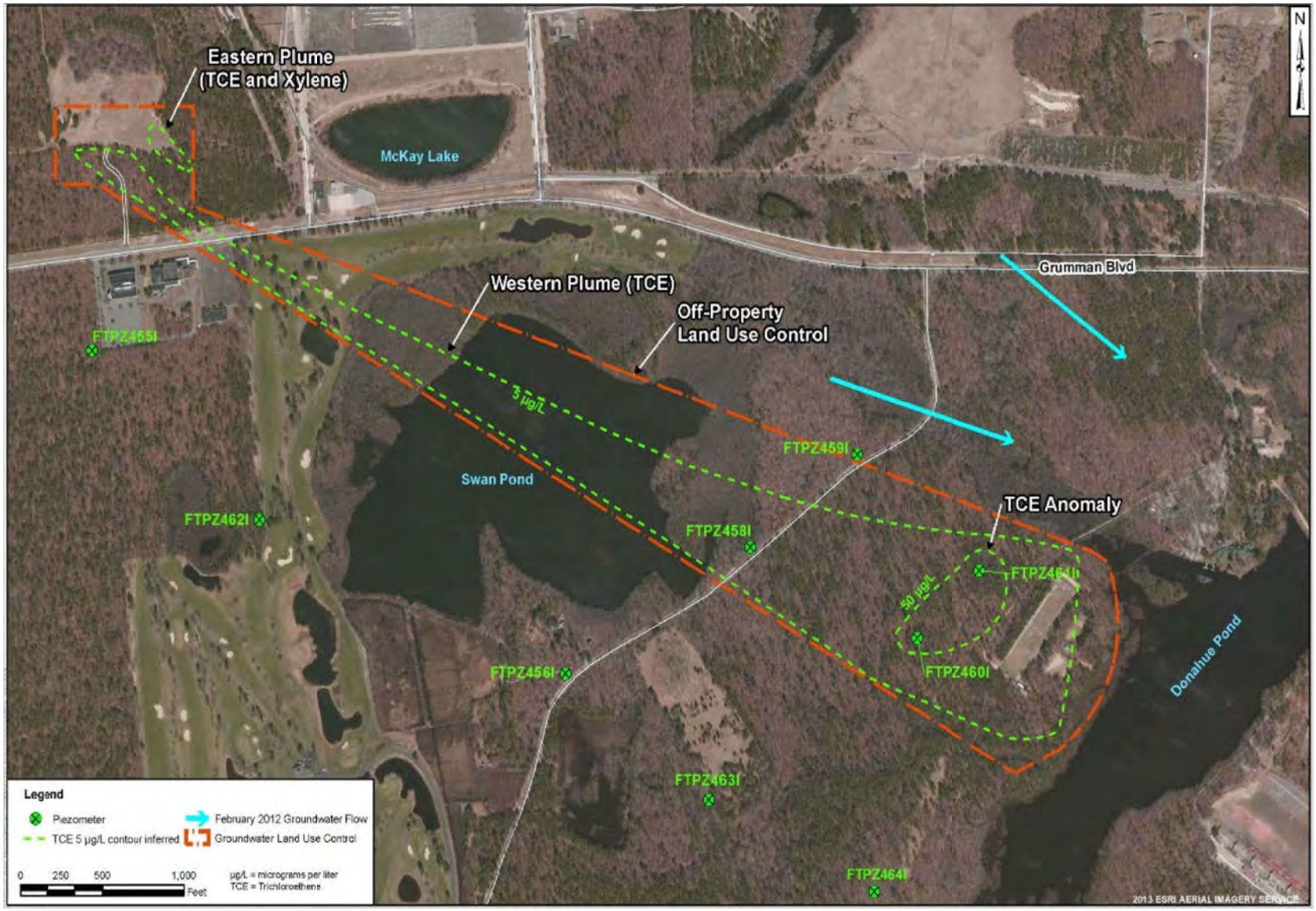
Site 2 –Conceptual Site Model



Site 2 —Proposed Plan
Interim Remedy for Soil and Groundwater

- **Proposed Remedy:**
  - Land Use Controls (LUCs) to identify areas and provide restrictions until cleanup is complete
  - Monitoring of groundwater to evaluate VOC migration and attenuation and to identify the need for additional action
  - If needed, enhanced biodegradation to be implemented using:
    - Oxygen releasing compound
    - Hydrogen releasing compound
  - Groundwater investigations are continuing for emerging contaminants (reason for interim remedy)
  - Capital Cost: $75,000
  - Annual cost: $42,000 to $120,000
  - 30-year total Cost: $2,000,000

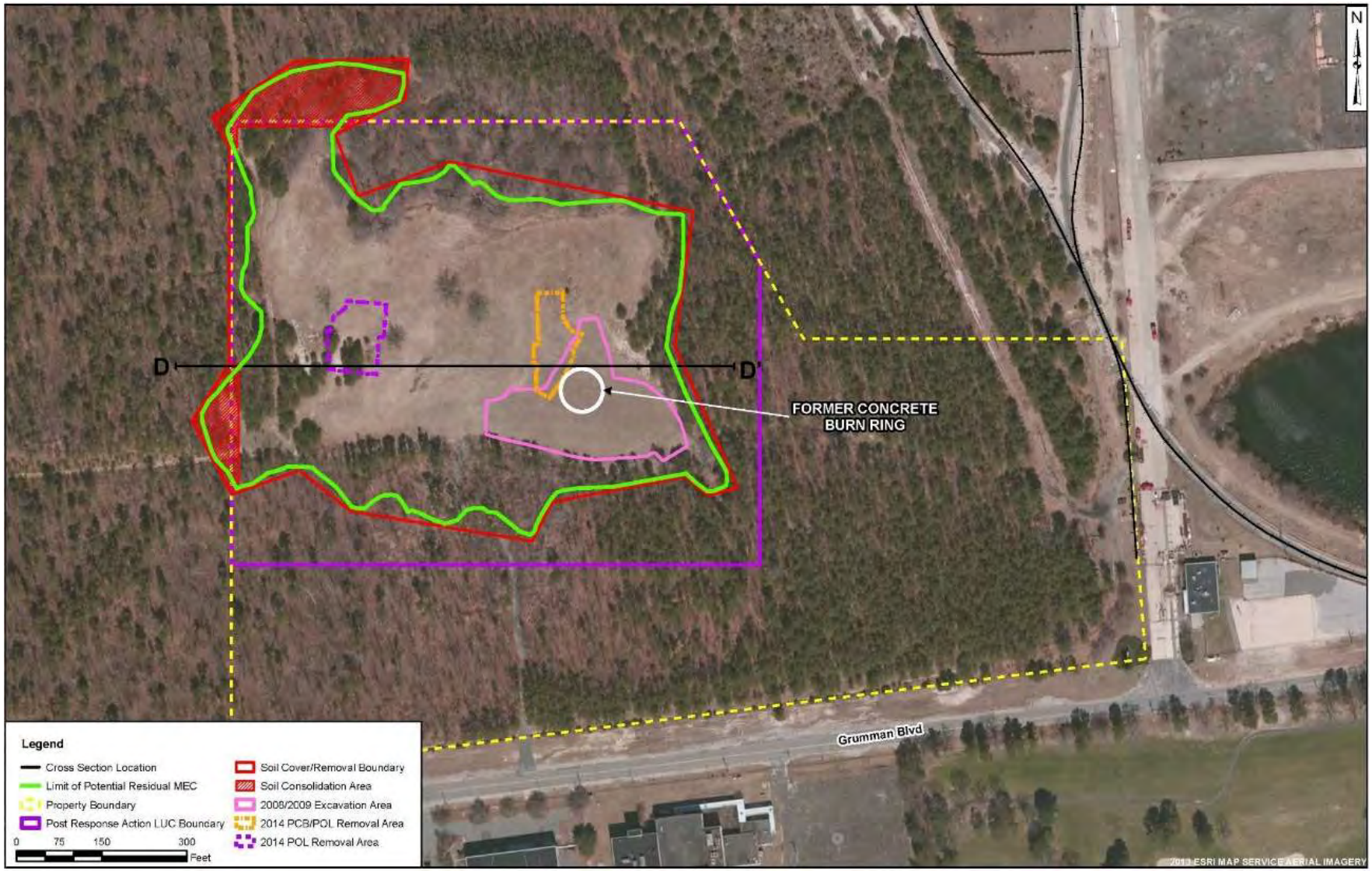
Site 2 – Proposed Plan
Interim Remedy for Soil and Groundwater



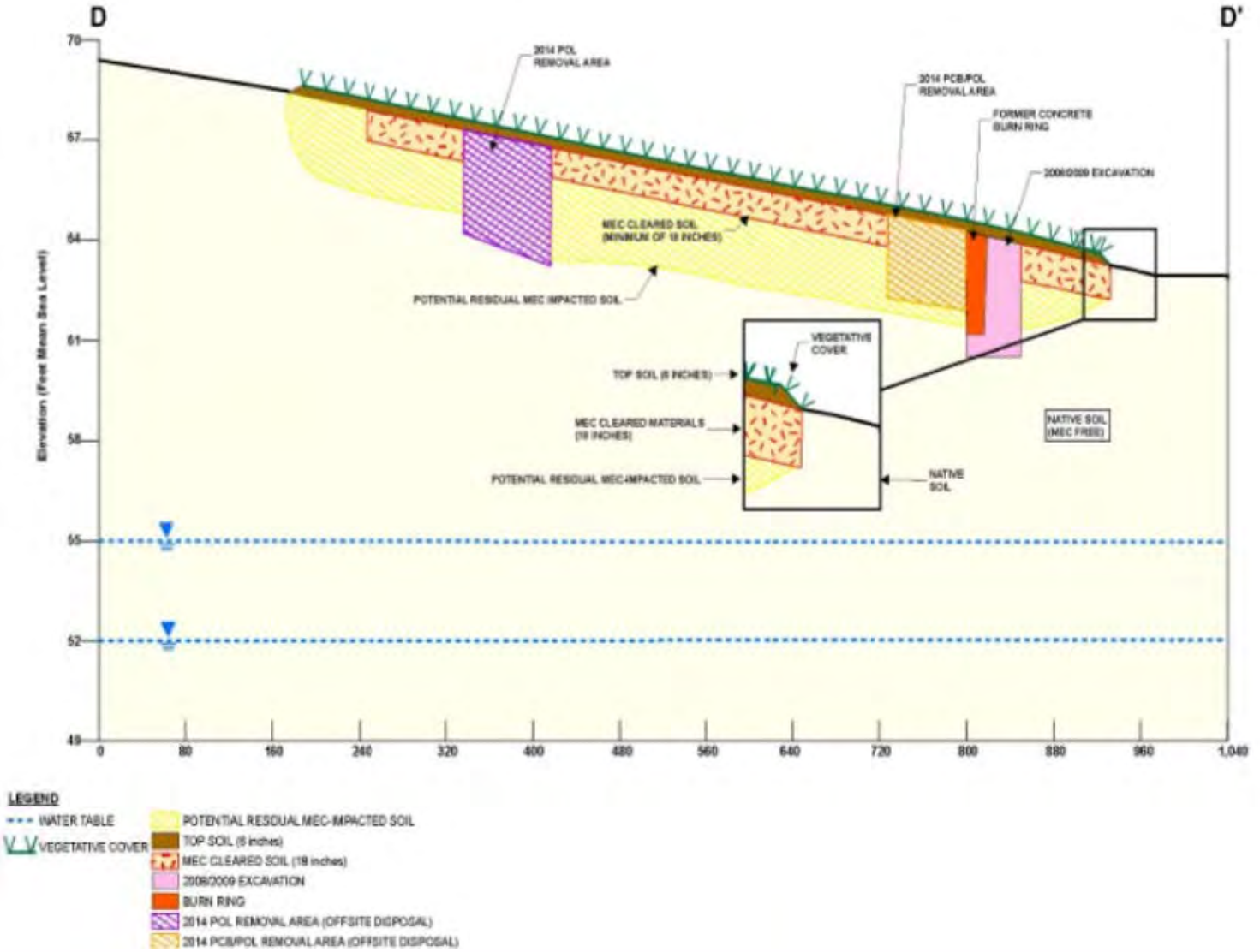
Site 2 —Proposed Plan
Remedy for Potential Residual MEC

- **Proposed Remedy:**
  - Consolidation of off-property material
  - Regrading, surface clearance, and addition of top soil and vegetation to stabilize the surface
  - LUCs to restrict future use of the site
  - Long-term erosion and control
  - Capital Cost: $2,600,000
  - Annual Cost: $26,000 to $56,000
  - 30-year cost of $3,600,000

Site 2 —Proposed Plan
Remedy for Potential Residual MEC



Site 2 – Proposed Plan
Remedy for Potential Residual MEC



Site 2 –Path Forward

- Public comment period March 16, 2017 through May 15, 2017
- Currently preparing Record of Decision (August 2017)
- Design (August 2107)
- Construction start Fall/Winter 2017

SITE 6A - SOUTHERN AREA FENCE LINE GROUNDWATER EXTRACTION TREATMENT SYSTEM

April 2017 Restoration Advisory Board

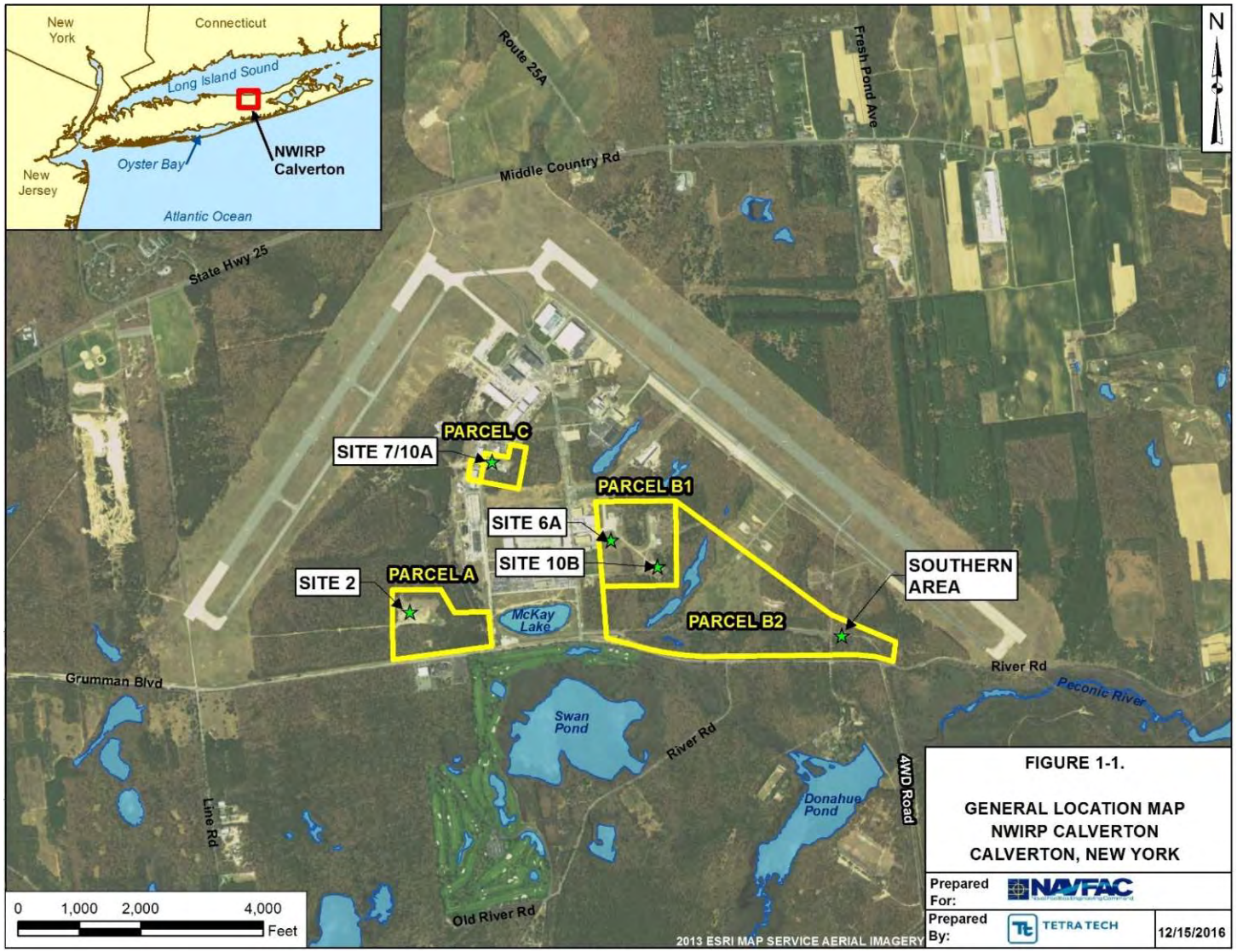
NWIRP CALVERTON, NEW YORK

April 4, 2017

Presentation Agenda

- Introduction
- System Overview
- System Operation
- System Performance / Recent Activities
- System Performance Summary / Future Activities

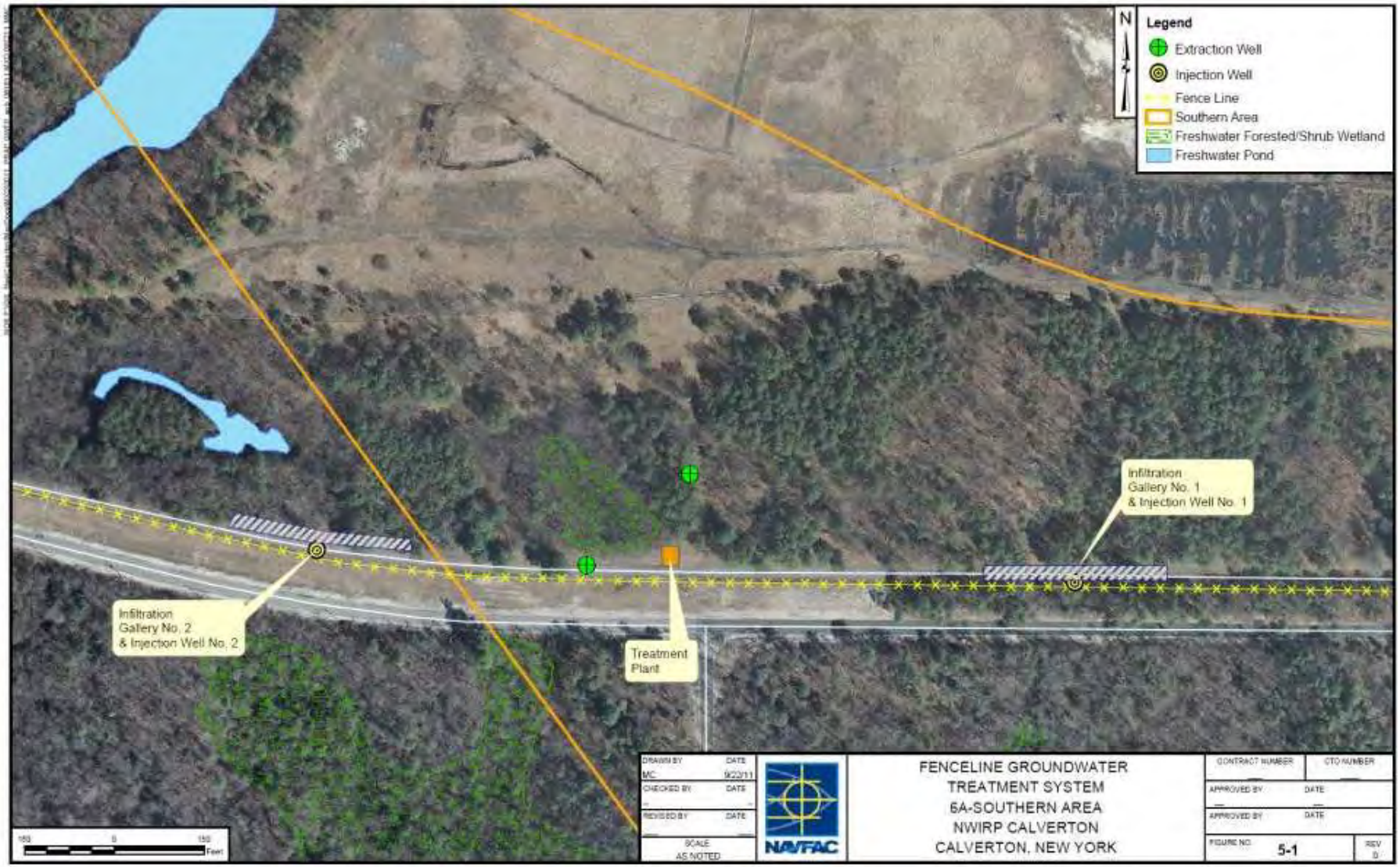
Site Layout


New York
Connecticut
Long Island Sound
NWIRP Calverton
Oyster Bay
New Jersey
Atlantic Ocean
Route 25A
Fresh Pond Ave
Middle Country Rd
State Hwy 25
N
PARCEL C
SITE 7/10A
PARCEL B1
SITE 6A
SITE 10B
SITE 2
PARCEL A
SOUTHERN AREA
McKay Lake
PARCEL B2
Grumman Blvd
River Rd
Peconic River
Swan Pond
River Rd
4WD Road
Donahue Pond
Line Rd
Old River Rd
0 1,000 2,000 4,000 Feet
2013 ESRI MAP SERVICE AERIAL IMAGERY
FIGURE 1-1.
GENERAL LOCATION MAP
NWIRP CALVERTON
CALVERTON, NEW YORK
Prepared For: NAVFAC
Prepared By: TETRA TECH
12/15/2016

Fence Line Treatment System Overview

- **Record of Decision (ROD) in May 2012**
- **Selected remedy for Fence Line Area —LUCs and monitoring with extraction, treatment, and infiltration**
- **Remedial Design for Fence Line Treatment System (FLTS) in May 2012**
- **Fence Line Treatment System overview:**
  - Two extraction wells (EW-1 and EW-3), up to 100 gallons per minute
  - VOCs removed via air stripping
  - Treated groundwater re-injected through infiltration galleries, meeting MCLs
- **Construction began in October 2012**
- **System start-up occurred 8 October 2013**
- **EW-2 taken off-line and replacement well EW-3 brought on-line in February 2016 to increase flow recovery**

Fence Line Treatment System Overview



Fence Line Treatment System Overview

Treatment Plant Building

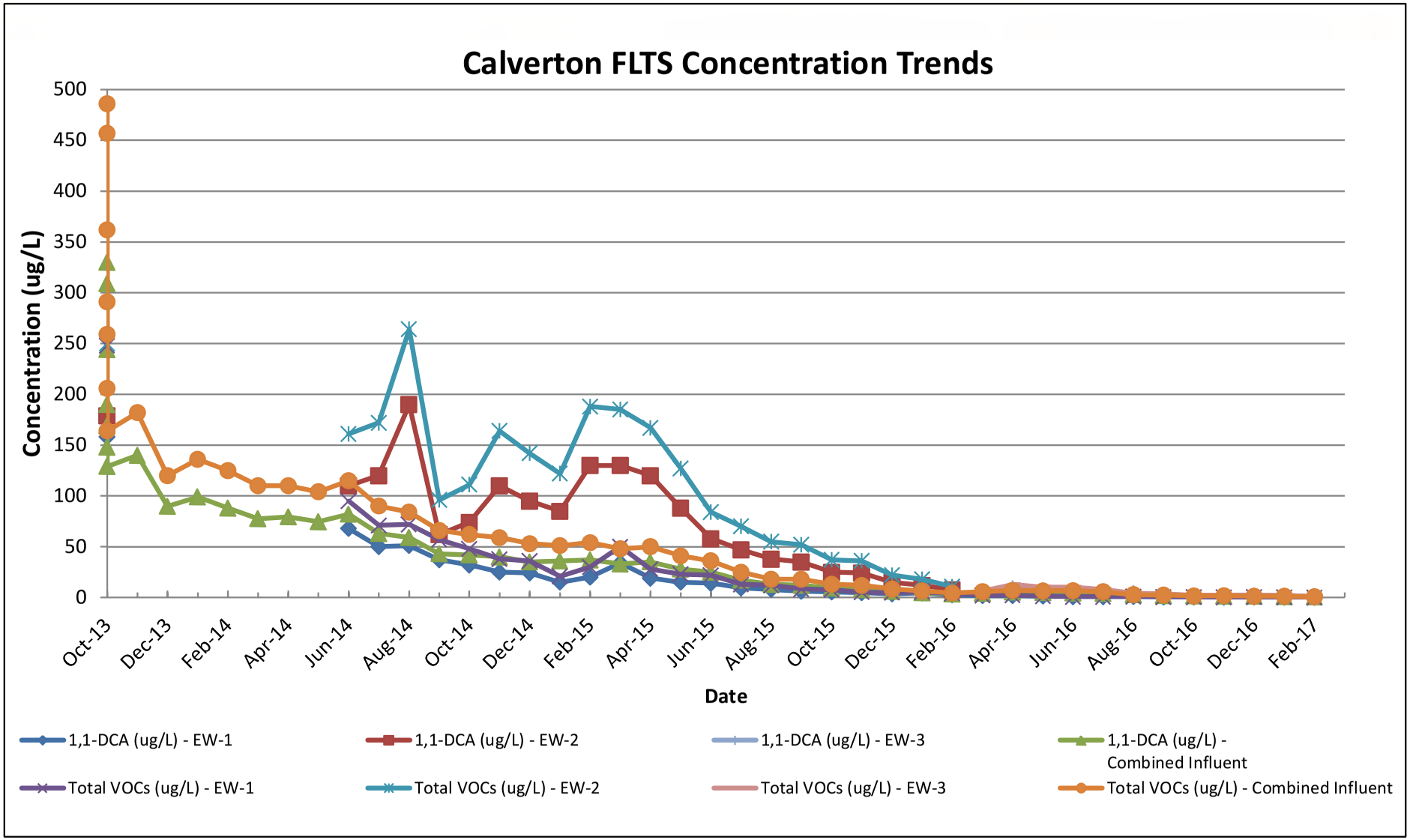
System Components

Fence Line Treatment System Operation

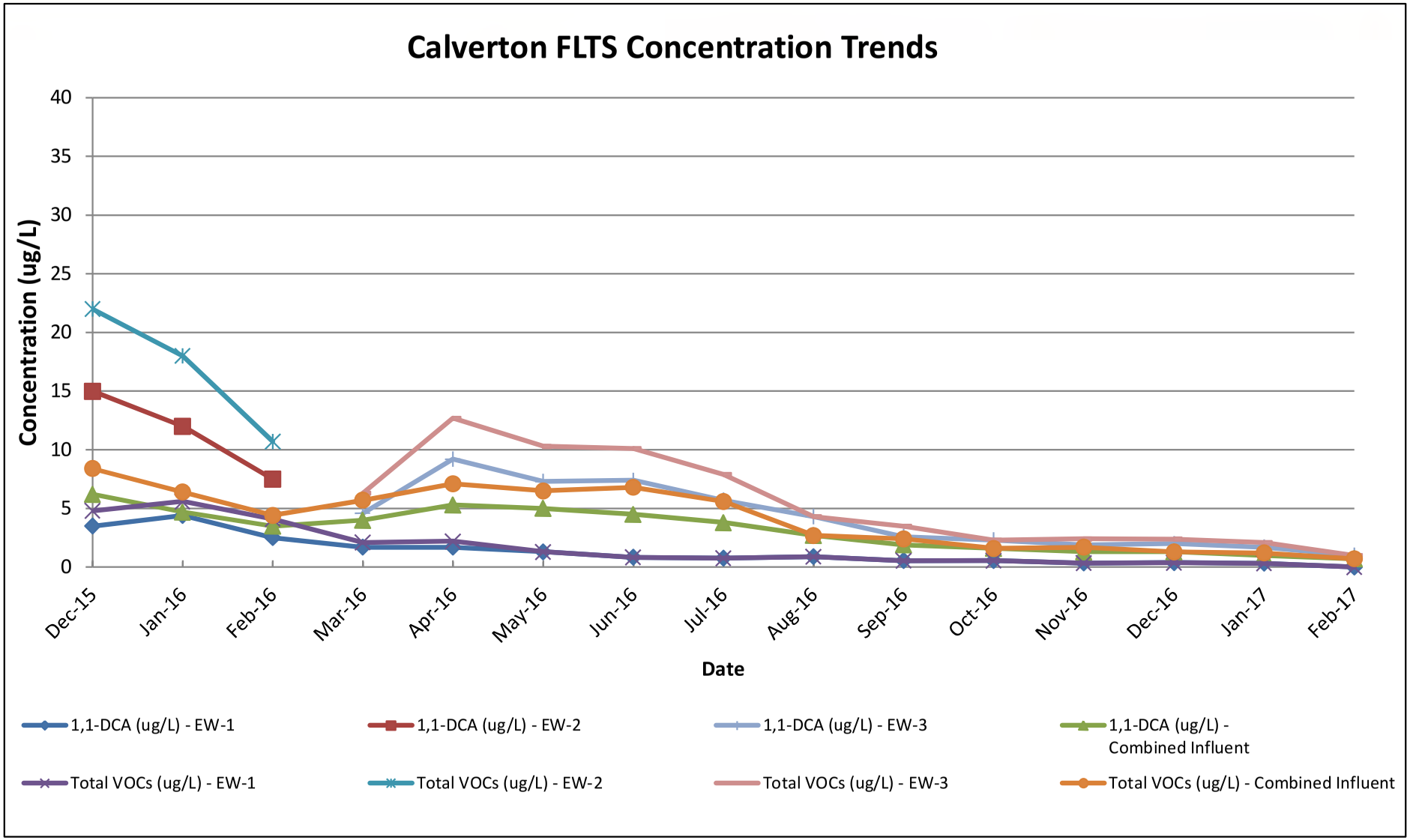
FLOW DATA			
Date	Total Monthly Flow (gal)	Total Cumulative Flow (gal)	Average Influent Flowrate (gpm)
13-Dec	1,715,264	6,980,790	61.5
14-Jan	2,358,016	9,338,806	77
14-Feb	3,814,953	13,153,759	96.2
14-Mar	3,794,639	16,948,398	91.3
14-Apr	3,683,505	20,631,903	91
14-May	3,658,145	24,290,048	87.9
14-Jun	3,149,276	27,439,324	85
14-Jul	3,113,492	30,552,816	79.4
14-Aug	3,113,492	33,666,308	81.7
14-Sep	1,949,358	35,615,666	78.8
14-Oct	3,744,800	39,360,466	87
14-Nov	2,325,171	41,685,637	88.4
14-Dec	3,791,812	45,477,450	91
15-Jan	3,711,714	49,189,164	87.1
15-Feb	3,331,398	52,520,562	87
15-Mar	2,435,158	54,955,720	77.3
15-Apr	3,152,581	58,108,301	76.1
15-May	3,020,310	61,128,611	77.2
15-Jun	2,700,213	63,828,824	73.1
15-Jul	3,167,585	66,996,409	71.1

FLOW DATA			
Date	Total Monthly Flow (gal)	Total Cumulative Flow (gal)	Average Influent Flowrate (gpm)
15-Aug	2,660,132	69,656,541	64.5
15-Sep	2,849,371	72,505,912	68.6
15-Oct	2,725,555	75,231,467	65.1
15-Nov	2,506,673	77,738,140	68.8
15-Dec	2,642,380	80,380,520	67.5
16-Jan	2,160,582	82,541,102	69.8
16-Feb	2,832,957	85,374,059	73.4
16-Mar	3,931,870	89,305,929	94.5
16-Apr	2,960,041	92,265,970	76.4
16-May	2,761,171	95,027,141	70.8
16-Jun	3,418,214	98,445,355	79.5
16-Jul	3,372,265	101,817,620	79.6
16-Aug	3,336,255	105,153,875	79.2
16-Sep	2,481,681	107,635,556	71.8
16-Oct	3,011,578	110,647,134	76.8
16-Nov	2,979,584	113,626,718	75.2
16-Dec	3,198,070	116,824,788	71.6
17-Jan	3,142,197	119,966,985	73.8
17-Feb	2,265,949	122,232,934	64.9

Fence Line Treatment System Operation



Fence Line Treatment System Operation



Fence Line Treatment System Operation

Target VOC Mass Removal		
Date	Monthly VOC Mass Removal (lb)	Cumulative VOC Mass Removal (lb)
13-Oct	4.04	4.04
13-Nov	3.46	7.5
13-Dec	1.7	9.2
14-Jan	2.66	11.86
14-Feb	3.95	15.81
14-Mar	3.45	19.26
14-Apr	3.35	22.61
14-May	3.16	25.77
14-Jun	3	28.77
14-Jul	2.32	31.09
14-Aug	2.35	33.44
14-Sep	1.06	34.5
14-Oct	1.94	36.44
14-Nov	1.14	37.58
14-Dec	1.64	39.22
15-Jan	1.59	40.81
15-Feb	1.49	42.3
15-Mar	0.98	43.28
15-Apr	1.31	44.59
15-May	1.02	45.61

Target VOC Mass Removal		
Date	Monthly VOC Mass Removal (lb)	Cumulative VOC Mass Removal (lb)
15-Jun	0.81	46.42
15-Jul	0.67	47.09
15-Aug	0.41	47.5
15-Sep	0.43	47.93
15-Oct	0.3	48.23
15-Nov	0.25	48.48
15-Dec	0.18	48.66
16-Jan	0.12	48.78
16-Feb	0.1	48.88
16-Mar	0.19	49.07
16-Apr	0.18	49.25
16-May	0.15	49.4
16-Jun	0.19	49.59
16-Jul	0.16	49.75
16-Aug	0.08	49.83
16-Sep	0.05	49.88
16-Oct	0.04	49.92
16-Nov	0.04	49.96
16-Dec	0.03	49.99
17-Jan	0.03	50.02
17-Feb	0.01	50.03

Fence Line Treatment System Performance / Recent Activities

- **Overall decreasing trend observed in combined influent VOC concentrations**
  - Target VOC concentrations in EW1 and EW3 have remained below 5 ug/L since August 2016
  - Began analyzing for full-list VOCs in May 2016 due to tetrachloroethene (PCE) detections in Site monitoring wells
    - PCE concentrations in combined influent ranged from 8.9 ug/L in May 2016 to 2.4 ug/L in February 2017

EW-3 Wellhead

Fence Line Treatment System Performance / Recent Activities

- **Flow rates have been adjusted down due to reduced ability of infiltration galleries to accept flow**

- **Letter work plan to perform chemical redevelopment of infiltration galleries was approved in September 2016**
  - November 2016, began weekly injections of industrial food grade sodium bisulfite
  - Test pits along the infiltration galleries scheduled for April 2017
  - Continued evaluation of alternatives

Fence Line Treatment System Performance Summary / Future Activities

- Continued compliance with all discharge goals
- Continued VOC removal efficiencies of >99%
- Influent analytical results below MCLs
- Continue evaluating groundwater concentrations in Area / shut-down criteria
- Continue evaluating infiltration gallery capacity and perform system modifications if needed
- Continue to perform monthly compliance sampling and submit monthly compliance reports

SITE 7 – FUEL DEPOT AIR SPARGING/SOIL VAPOR EXTRACTION SYSTEM UPDATE

April 2017 Restoration Advisory Board

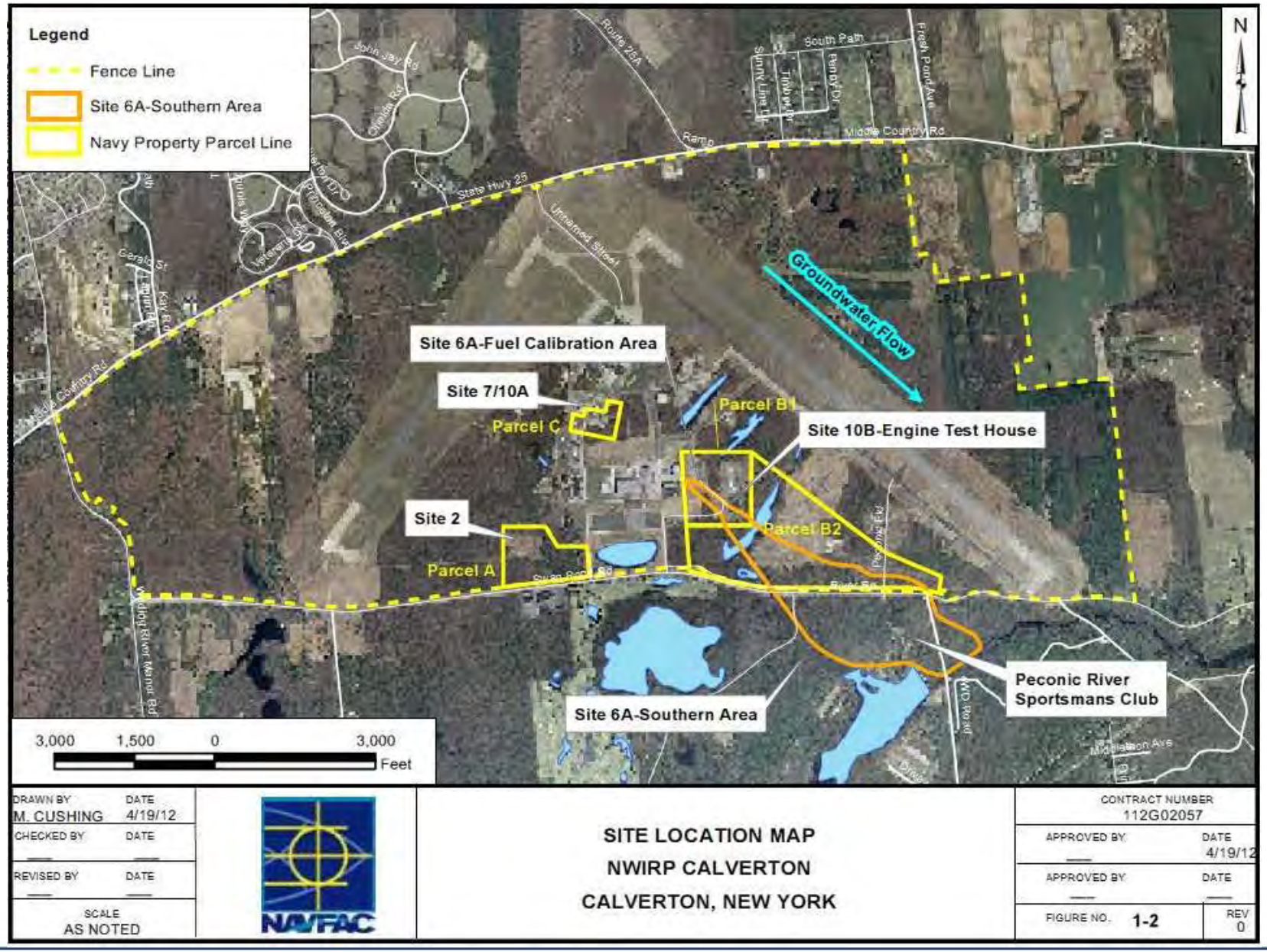
NWIRP CALVERTON, NEW YORK

April 4, 2017

Outline of Presentation

- **Introduction**
- **System Performance / Background Information**
  - Decommissioning of full-scale AS/SVE System
- **Monitoring Requirements**
  - Groundwater Monitoring Requirements / Results
- **Recent Events**
- **Summary and Path Forward**

Introduction

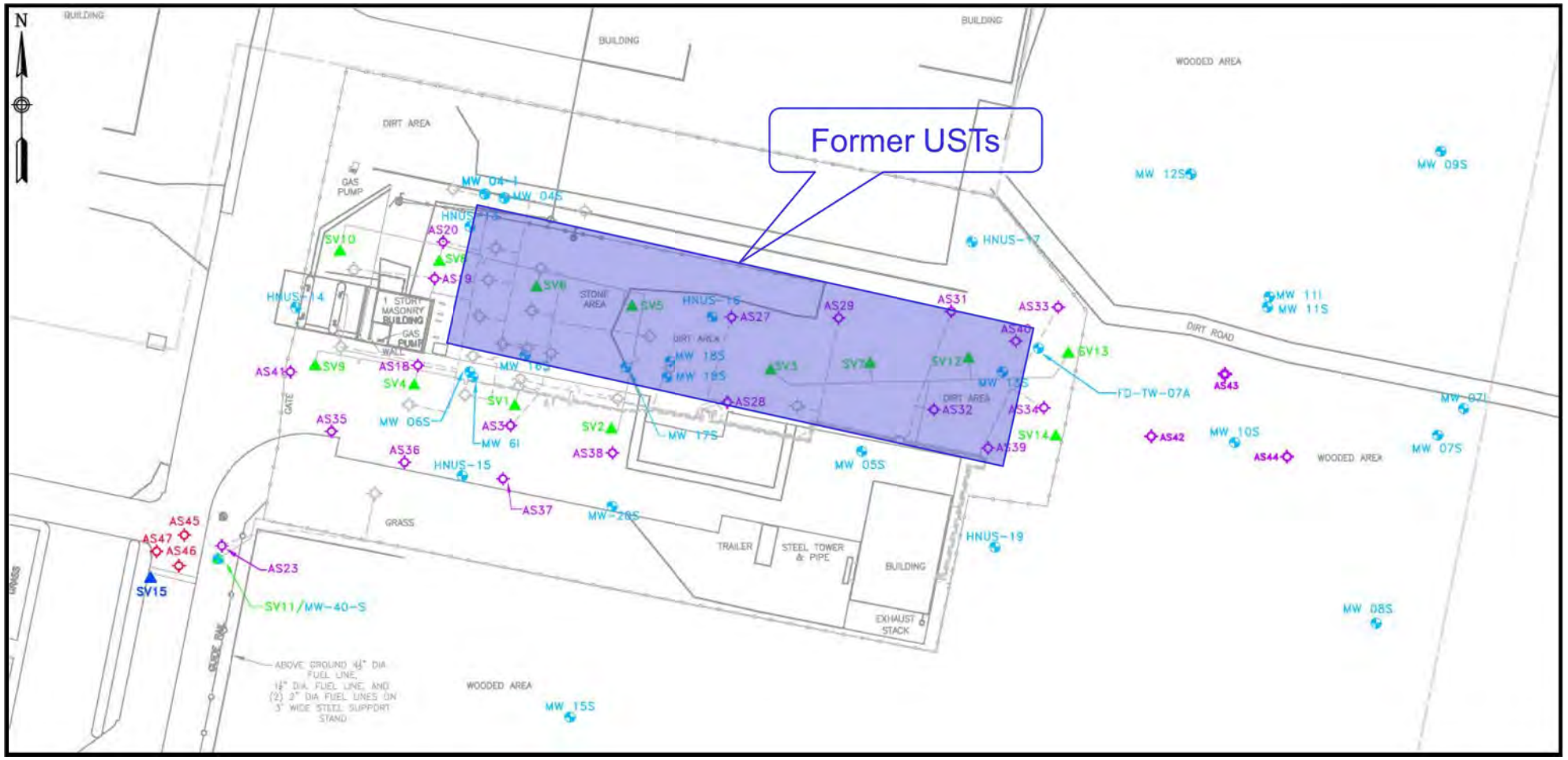


Introduction

- Air Sparing/Soil Vapor Extraction (AS/SVE) system started operation in 2005 (pilot)/2006 (full scale)
- Operated seasonally (April to December)
- Three modifications were made to the system to improve performance
- System reached end of its functional life November 2013
- System was shut down in November 2013 and monitoring began per the Performance and Shutdown Evaluation document (Nov 2013)

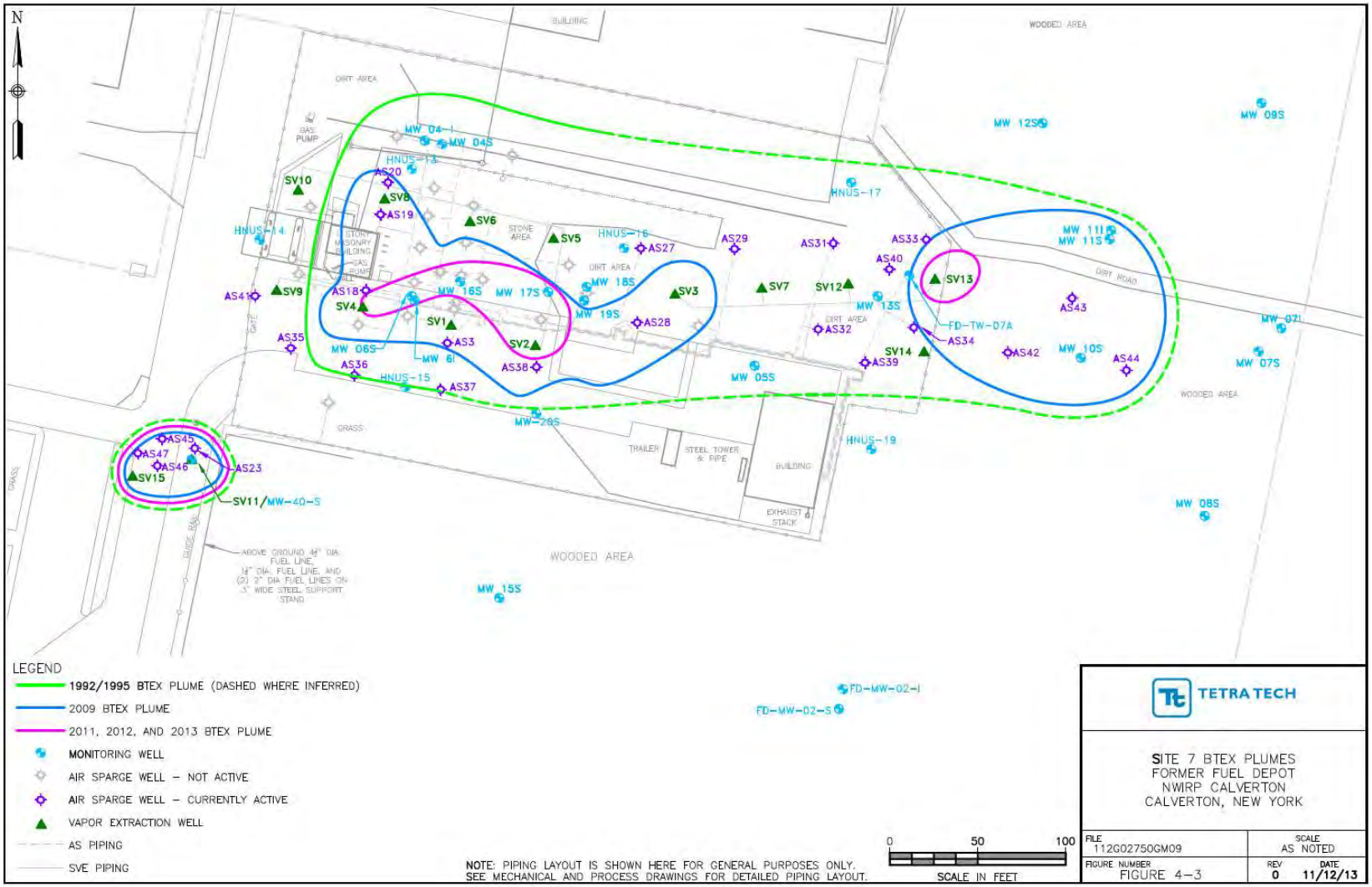
Introduction

Injection, Extraction, and Monitoring Wells



System Performance

1992/1995, 2009, and 2011 to 2013 Plume Boundaries



Monitoring Requirements

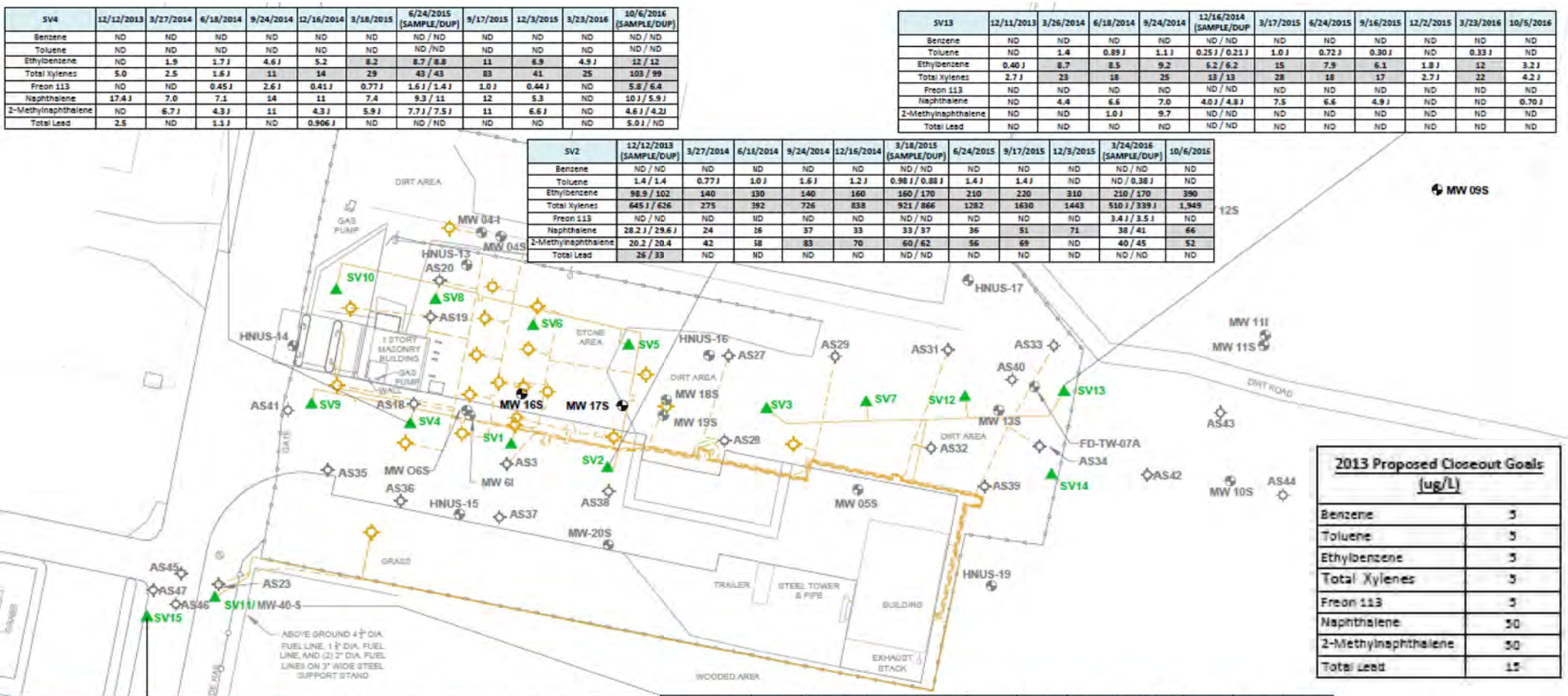
- **Semiannual Groundwater Sampling**
- **Select Volatile Organic Compounds (VOCs), 2-methylnaphthalene, and lead**
- **Currently 11 monitoring wells are sampled each Spring and Fall**
  - 7 wells which previously had exceedances of 2003 ROD Remediation Goals and;
  - 4 on-site monitoring wells located downgradient of contaminated groundwater
- **Annual Monitoring Report**
- **Institutional controls restricting the use of groundwater as a source of potable or process water**
- **Five Year Reviews**

Quarterly/Semiannual Groundwater Sampling

SV4	12/12/2013	3/27/2014	6/18/2014	9/24/2014	12/16/2014	3/18/2015	6/24/2015 (SAMPLE/DUP)	9/17/2015	12/3/2015	3/23/2016	10/6/2016 (SAMPLE/DUP)
Benzene	ND	ND	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND / ND
Toluene	ND	ND	ND	ND	ND	ND	ND /ND	ND	ND	ND	ND / ND
Ethylbenzene	ND	1.9	1.7 J	4.6 J	5.2	8.2	8.7 / 8.8	11	6.9	4.9 J	12 / 12
Total Xylenes	5.0	2.5	1.6 J	11	14	29	43 / 43	83	41	25	103 / 99
Freon 113	ND	ND	0.45 J	2.6 J	0.41 J	0.77 J	1.6 J / 1.4 J	1.0 J	0.44 J	ND	5.8 / 6.4
Naphthalene	17.4 J	7.0	7.1	14	11	7.4	9.3 / 11	12	5.3	ND	10 J / 5.9 J
2-Methylnaphthalene	ND	6.7 J	4.3 J	11	4.3 J	5.9 J	7.7 J / 7.5 J	11	6.6 J	ND	4.6 J / 4.2J
Total Lead	2.5	ND	1.1 J	ND	0.906 J	ND	ND / ND	ND	ND	ND	5.0 J / ND

SV13	12/11/2013	3/26/2014	6/18/2014	9/24/2014	12/16/2014 (SAMPLE/DUP	3/17/2015	6/24/2015	9/16/2015	12/2/2015	3/23/2016	10/5/2016
Benzene	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND
Toluene	ND	1.4	0.89 J	1.1 J	0.25 J / 0.21 J	1.0 J	0.72 J	0.30 J	ND	0.33 J	ND
Ethylbenzene	0.40 J	8.7	8.5	9.2	6.2 / 6.2	15	7.9	6.1	1.8 J	12	3.2 J
Total Xylenes	2.7 J	23	18	25	13 / 13	28	18	17	2.7 J	22	4.2 J
Freon 113	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	4.4	6.6	7.0	4.0 J / 4.8 J	7.5	6.6	4.9 J	ND	ND	0.70 J
2-Methylnaphthalene	ND	ND	1.0 J	9.7	ND / ND	ND	ND	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND

SV2	12/12/2013 (SAMPLE/DUP)	3/27/2014	6/18/2014	9/24/2014	12/16/2014	3/18/2015 (SAMPLE/DUP)	6/24/2015	9/17/2015	12/3/2015	3/24/2016 (SAMPLE/DUP)	10/6/2016
Benzene	ND / ND	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND / ND	ND
Toluene	1.4 / 1.4	0.77 J	1.0 J	1.6 J	1.2 J	0.98 J / 0.88 J	1.4 J	1.4 J	ND	ND / 0.38 J	ND
Ethylbenzene	98.9 / 102	140	130	140	160	160 / 170	210	220	310	210 / 170	390
Total Xylenes	645 J / 626	275	392	726	838	921 / 866	1282	1630	1443	510 J / 339 J	1,949
Freon 113	ND / ND	ND	ND	ND	ND	ND / ND	ND	ND	ND	3.4 J / 3.5 J	ND
Naphthalene	28.2 J / 29.6 J	24	16	37	33	33 / 37	36	51	71	38 / 41	66
2-Methylnaphthalene	20.2 / 20.4	42	58	83	70	60 / 62	56	69	ND	40 / 45	52
Total Lead	26 / 33	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND / ND	ND



2013 Proposed Closeout Goals (ug/L)	
Benzene	5
Toluene	5
Ethylbenzene	5
Total Xylenes	5
Freon 113	5
Naphthalene	50
2-Methylnaphthalene	50
Total Lead	15

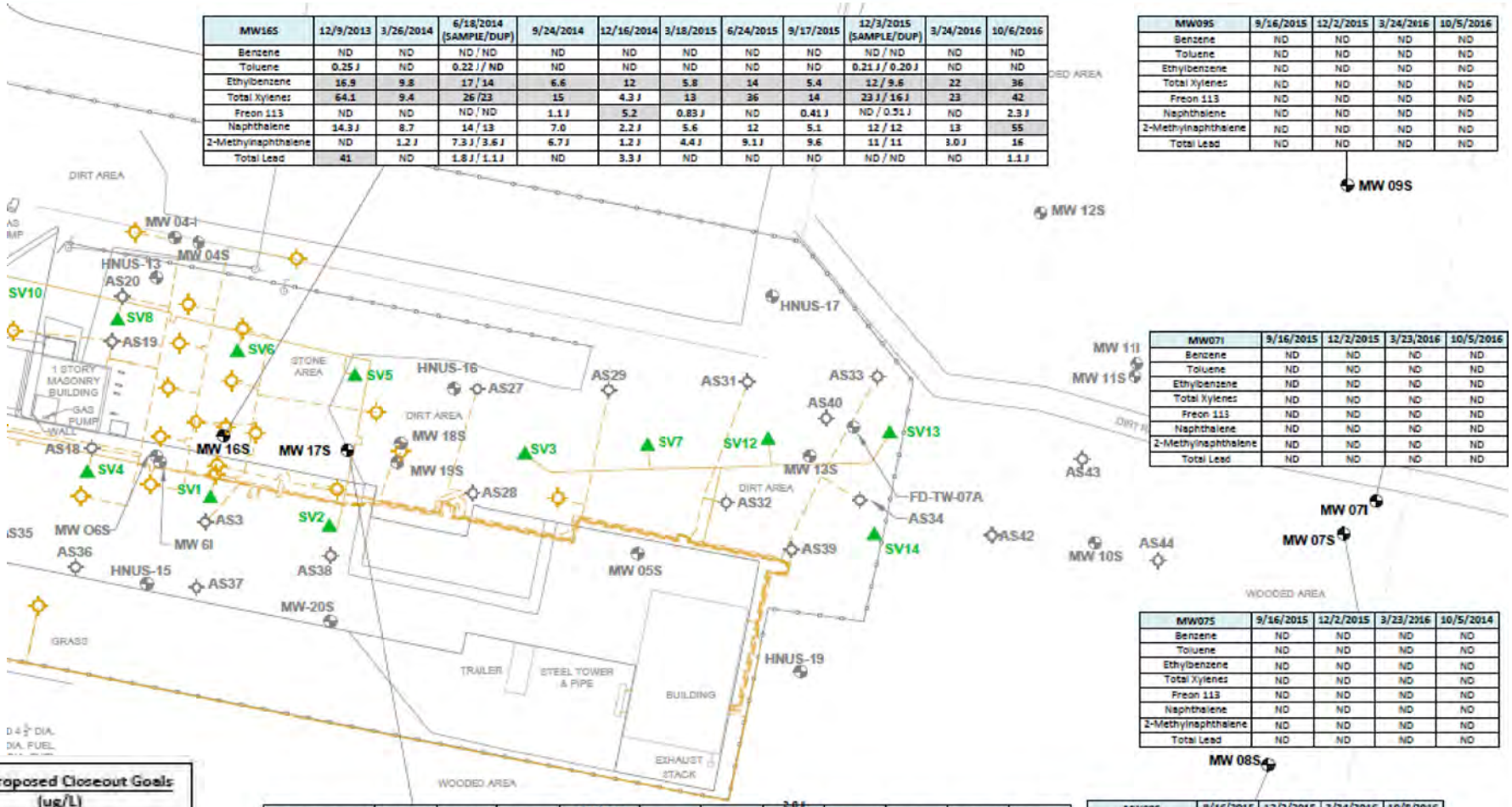
SV15	12/12/2013	3/27/2014	6/18/2014	9/24/2014	12/16/2014	3/18/2015	6/24/2015	9/17/2015	12/2/2015	3/23/2016	10/5/2016
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	0.77 J	0.63 J	0.39 J	0.40 J	ND	ND	ND	ND	ND	0.62 J	ND
Naphthalene	ND	1.2	ND	ND	0.63 J	ND	ND	0.27 J	ND	ND	ND
2-Methylnaphthalene	9.8	9.0 J	ND	1.4	4.0 J	ND	ND	ND	ND	3.4 J	ND
Total Lead	1.1 J	ND	1.7 J	ND	ND	15.4	ND	ND	ND	ND	ND

SV11/MW40S	12/12/2013	3/27/2014 (SAMPLE/DUP	6/18/2014	9/24/2014	12/16/2014	3/18/2015	6/24/2015	9/17/2015 (SAMPLE/DUP)	12/2/2015	3/23/2016	10/5/2016
Benzene	ND	ND / ND	ND	ND	ND	ND	ND	ND / ND	ND	ND	ND
Toluene	3.2 J	0.64 J / 0.48 J	0.28 J	0.78 J	ND	ND	0.27 J	0.47 J / 0.33 J	0.21 J	0.24 J	ND
Ethylbenzene	1.8 J	1.2 / 0.86 J	0.27 J	0.54 J	0.21 J	0.27 J	0.20 J	0.93 J / 0.68 J	0.36 J	0.24 J	0.50 J
Total Xylenes	9.1 J	8.5 / 6.8	1.4 J	5.9 J	2.0 J	1.2 J	1.7 J	10.4 J / 7.5 J	2.8 J	1.4 J	2.2 J
Freon 113	137	52 J / 36 J	31	32	15	8.8	11	38 J / 28 J	15	11	3.9 J
Naphthalene	23.6 J	9.1 / 7.9	ND	6.9	2.6 J	ND	ND	9.6 / 7.3	ND	ND	4.3 J
2-Methylnaphthalene	ND	2.6 J / 2.5 J	ND	ND	ND	ND	ND	3.7 J / 3.6 J	1.1 J	ND	ND
Total Lead	9.5	ND / ND	ND	ND	ND	ND	ND	ND /ND	ND	ND	ND

N

*Gray shading - value exceeds 2013 Proposed Closeout Goal

Quarterly/Semi-Annual Groundwater Sampling



MW16S	12/9/2013	3/26/2014	6/18/2014 (SAMPLE/DUP)	9/24/2014	12/16/2014	3/18/2015	6/24/2015	9/17/2015	12/3/2015 (SAMPLE/DUP)	3/24/2016	10/6/2016
Benzene	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND / ND	ND	ND
Toluene	0.25 J	ND	0.22 J / ND	ND	ND	ND	ND	ND	0.21 J / 0.20 J	ND	ND
Ethylbenzene	16.9	9.8	17 / 14	6.6	12	5.8	14	5.4	12 / 9.6	22	36
Total Xylenes	64.1	9.4	26 /23	15	4.3 J	13	36	14	23 J / 16 J	23	42
Freon 113	ND	ND	ND / ND	1.1 J	5.2	0.83 J	ND	0.41 J	ND / 0.51 J	ND	2.3 J
Naphthalene	14.3 J	8.7	14 / 13	7.0	2.2 J	5.6	12	5.1	12 / 12	13	55
2-Methylnaphthalene	ND	1.2 J	7.3 J / 3.6 J	6.7 J	1.2 J	4.4 J	9.1 J	9.6	11 / 11	3.0 J	16
Total Lead	41	ND	1.8 J / 1.1 J	ND	3.3 J	ND	ND	ND	ND / ND	ND	1.1 J

MW09S	9/16/2015	12/2/2015	3/24/2016	10/5/2016
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND

MW 09S

MW07I	9/16/2015	12/2/2015	3/23/2016	10/5/2016
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND

MW07S	9/16/2015	12/2/2015	3/23/2016	10/5/2014
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND

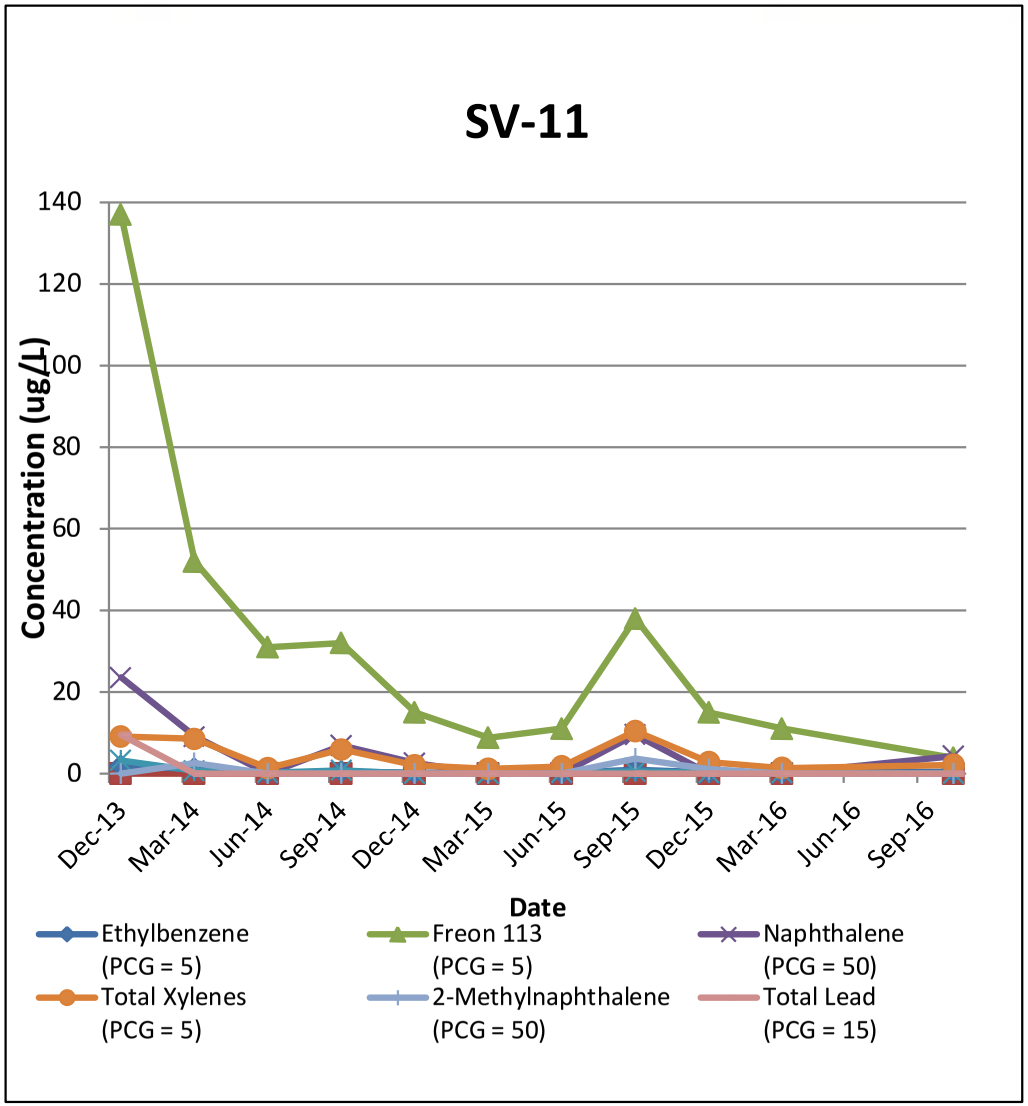
MW17S	12/10/2013	3/26/2014	6/18/2014	9/24/2014 (SAMPLE/DUP)	12/16/2014	3/18/2015	6/24/2015	9/17/2015	12/3/2015	3/24/2016	Oct. 2016
Benzene	ND	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND	NA
Toluene	0.25 J	0.20 J	0.21 J	0.20 J / 0.21 J	ND	ND	ND	ND	0.20 J	ND	NA
Ethylbenzene	7.1	17	22	12 / 12	22	11	9.5	17	24	50	NA
Total Xylenes	10.3	36	38	30 / 37	69	23	30	50	31 J	52	NA
Freon 113	ND	ND	ND	ND / ND	ND	0.38 J	0.83 J	2.0 J	ND	ND	NA
Naphthalene	22.7 J	41	40	28 J / 32	36	17	38	27	55	41	NA
2-Methylnaphthalene	ND	5.0 J	9.4 J	23 / 22	8.3 J	ND	23	27	23	24	NA
Total Lead	18	13.1	10.8	6.0 / 6.3	3.7 J	2.6 J		ND	ND	ND	NA

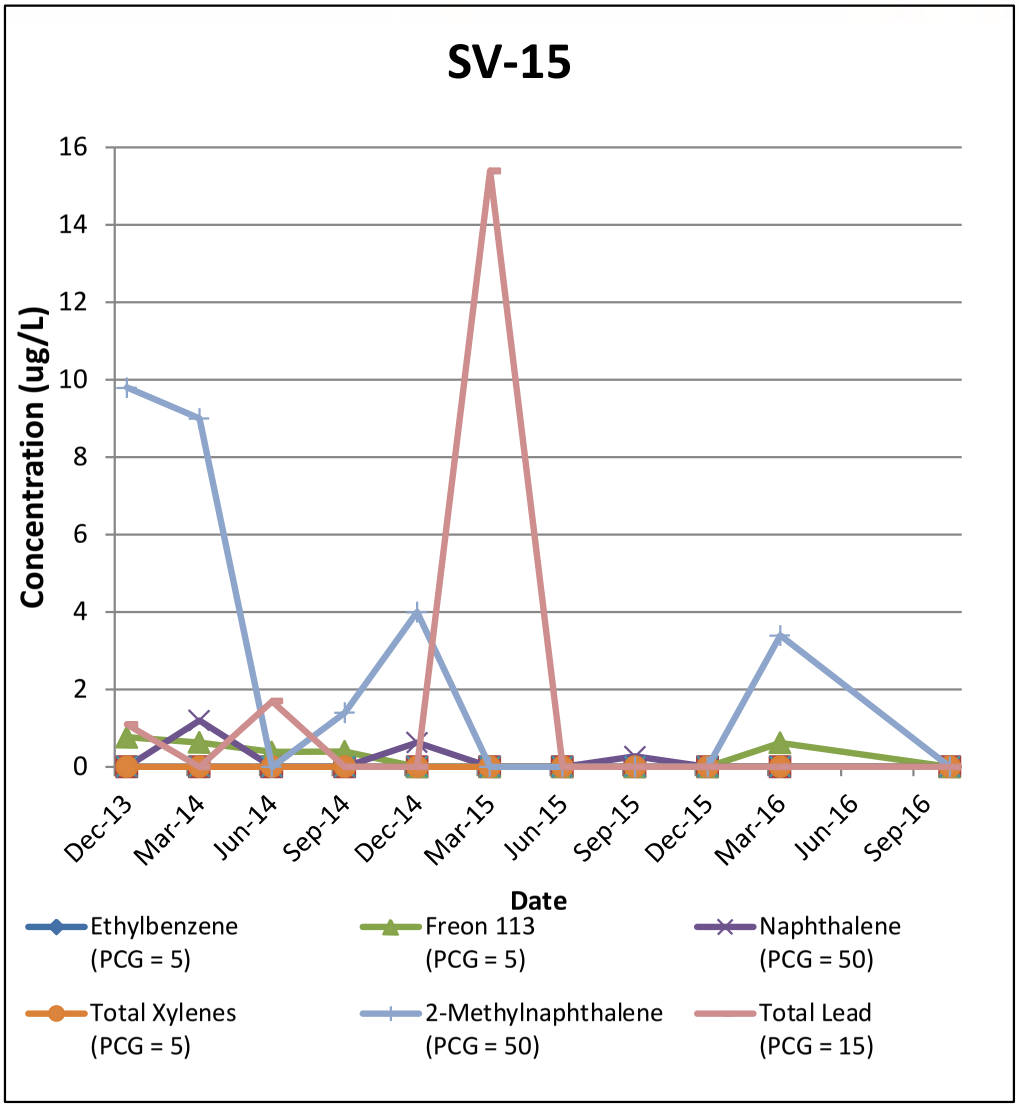
MW08S	9/16/2015	12/2/2015	3/24/2016	10/6/2016
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND

2013 Proposed Closeout Goals (ug/L)	
Benzene	5
Toluene	5
Ethylbenzene	5
Total Xylenes	5
Freon 113	5
Naphthalene	50
2-Methylnaphthalene	50
Total Lead	15

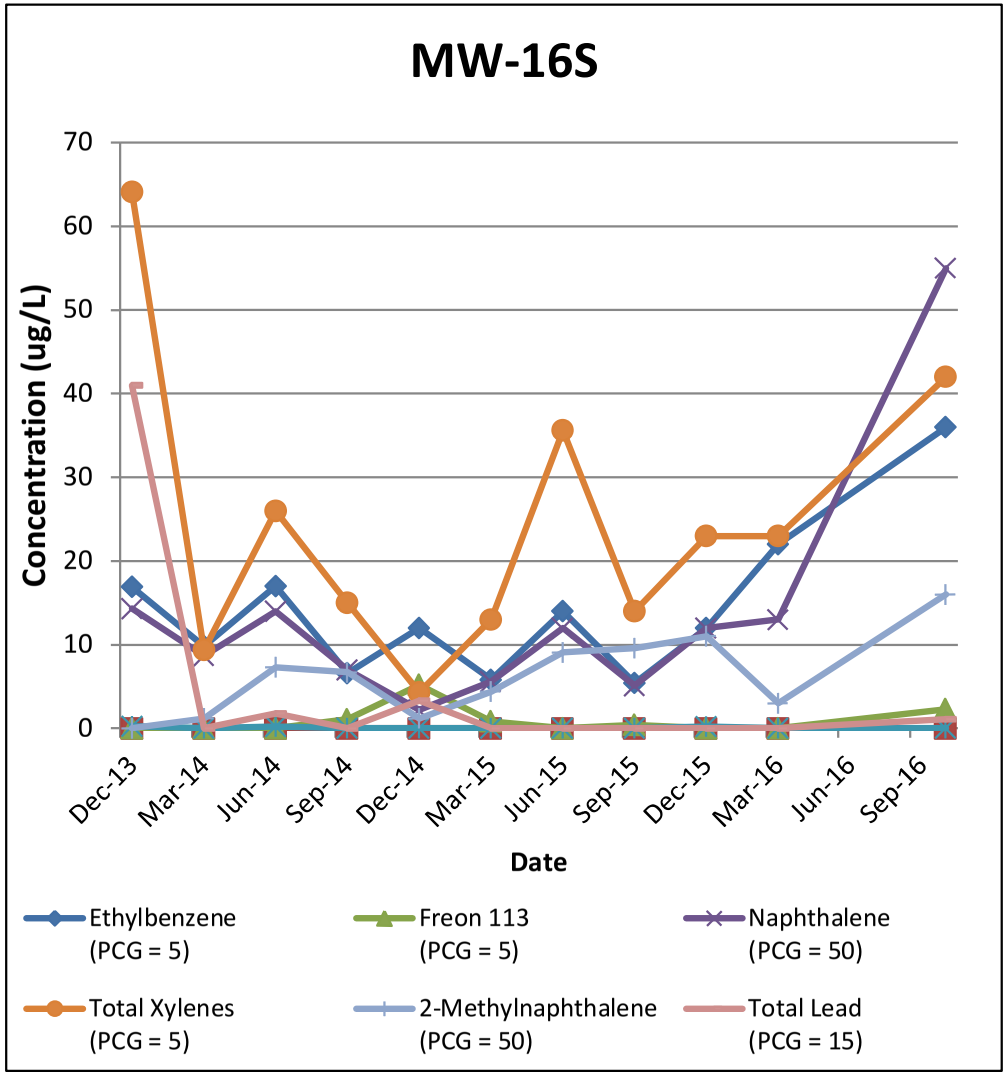
*Gray shading - value exceeds 2013 Proposed Closeout Goal

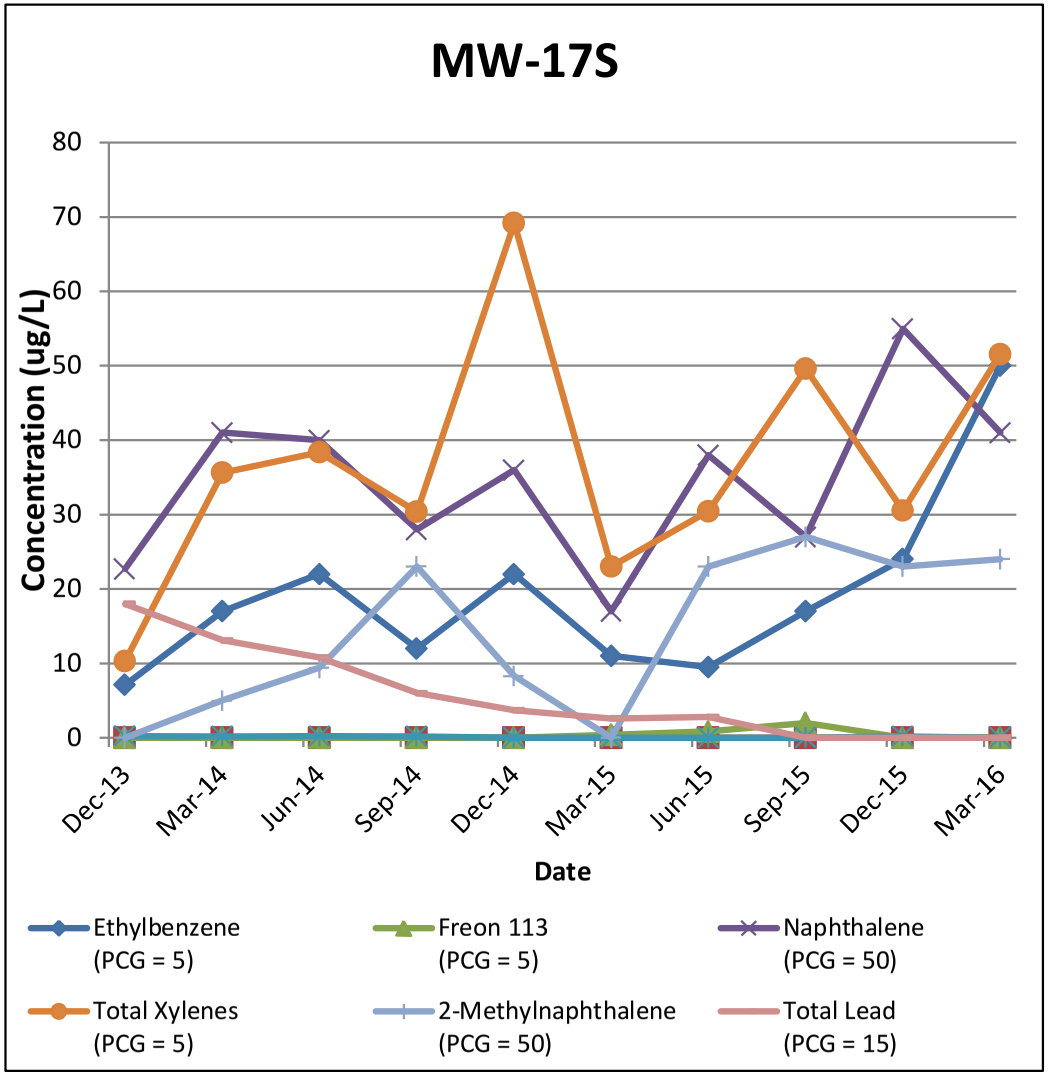
Quarterly/Semiannual Groundwater Sampling



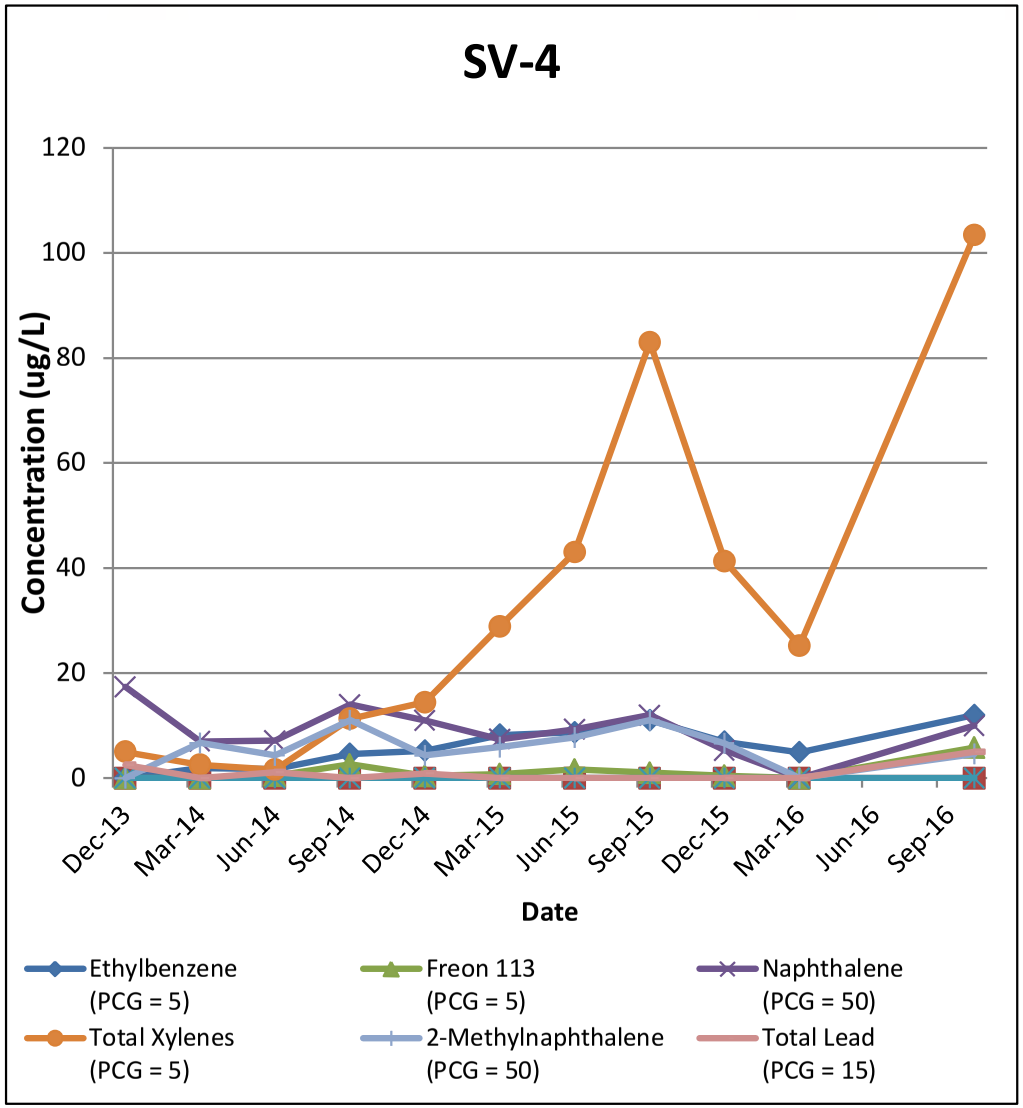


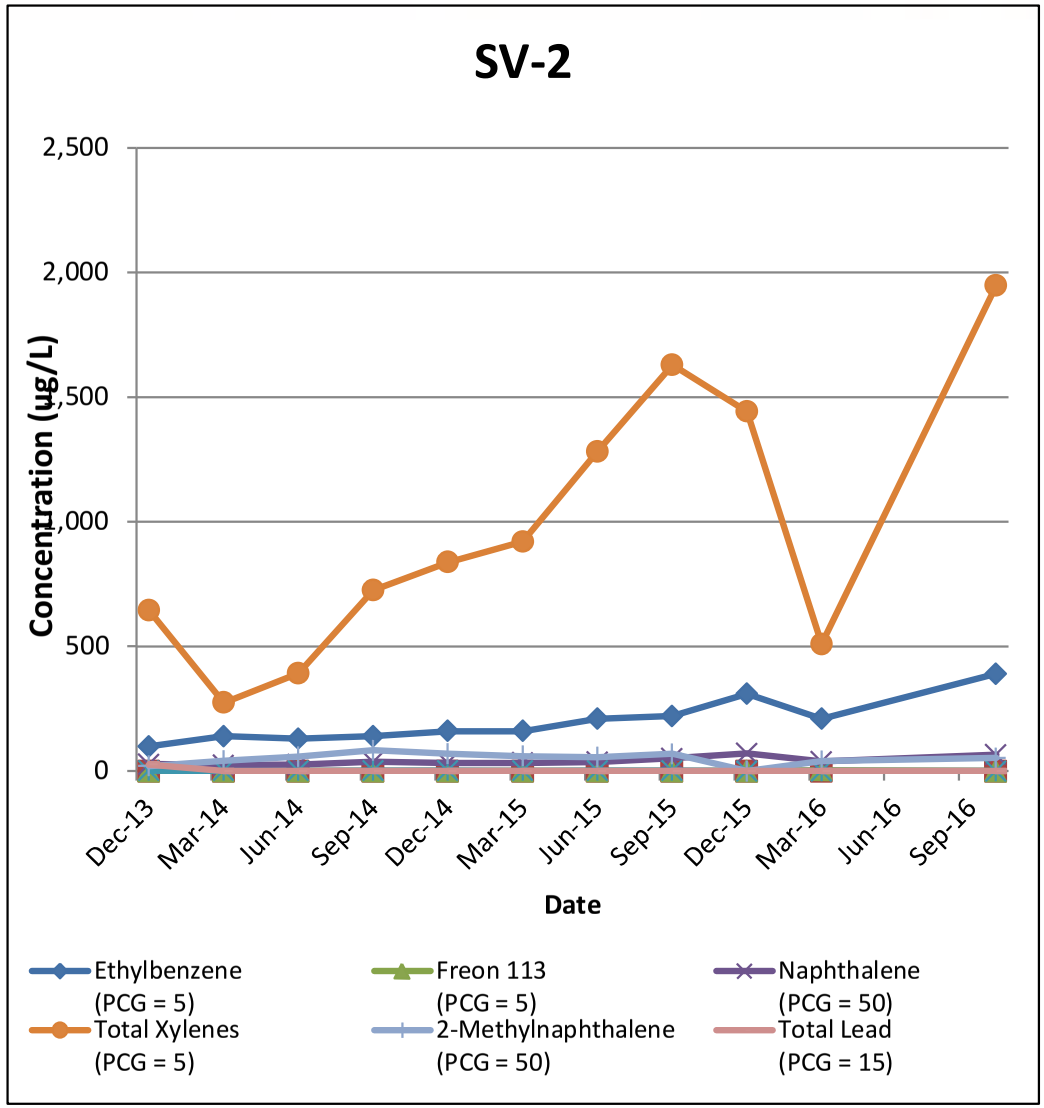
Quarterly/Semiannual Groundwater Sampling



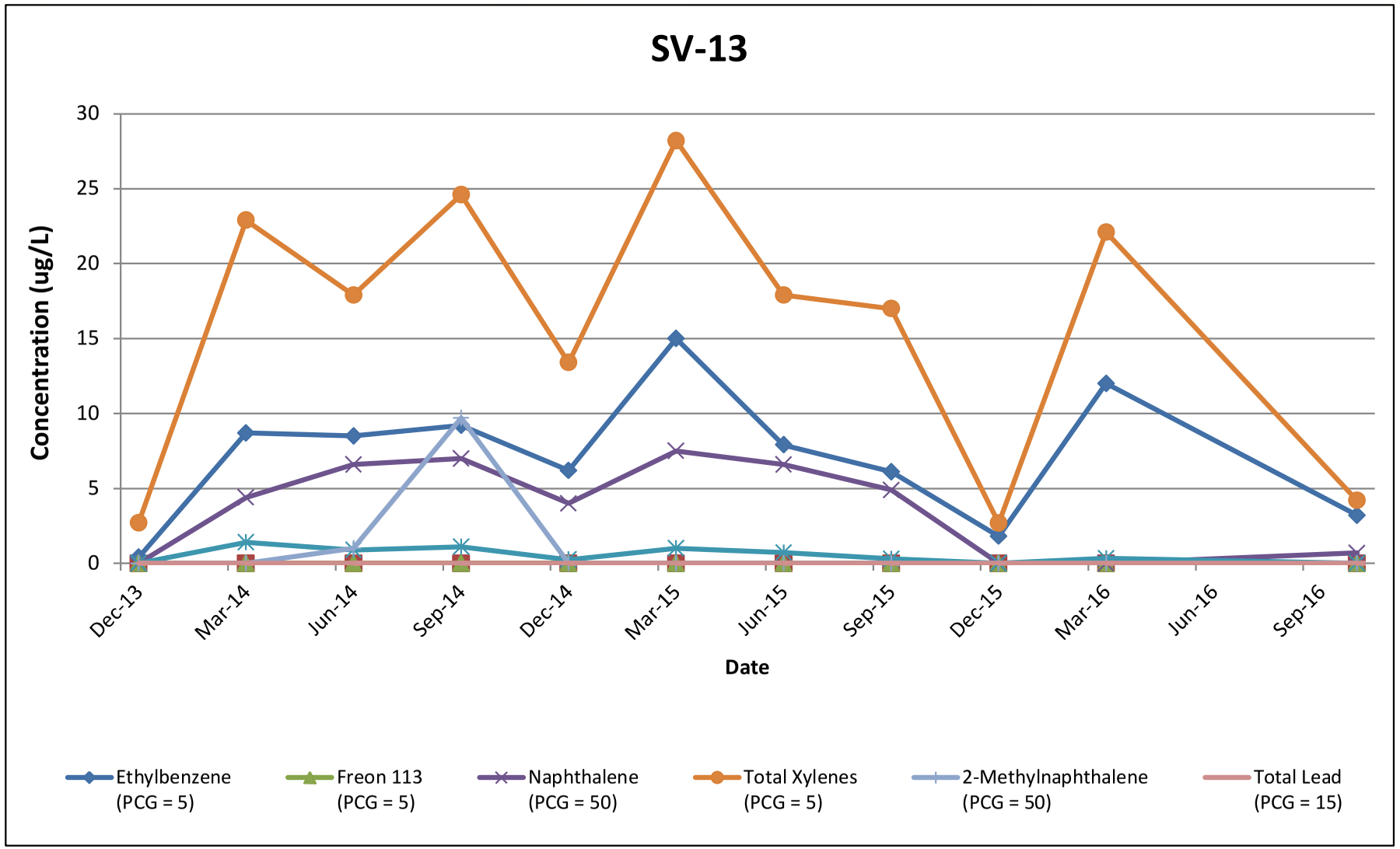


Quarterly/Semi-Annual Groundwater Sampling





Quarterly/Semiannual Groundwater Sampling



Recent Activities –October 2016

- **Semiannual Groundwater Monitoring Performed in October 2016**
  - Free product observed in MW-17S – no groundwater samples collected from this well
  - Performed additional site gauging, collected a sample of product for analysis
  - Began periodic gauging and bailing of Site 7 monitoring wells

- **Periodic gauging and bailing of monitoring wells is ongoing**
  - MW-17S – 1.12 ft. observed in October 2016. Decreased to 0.14 ft. in February 2017, and 0.21 ft. in March 2017
  - MW-19S – 1.05 ft. observed in November 2017. Not encountered in February/March 2017
  - MW-16S – 0.60 ft. observed in January 2017. Not encountered in February/March 2017

Summary and Path Forward

- **Direct-push technology (DPT) rig used to investigate in-situ conditions, March 2017**
  - One boring penetrated buried slab, one ended at slab (impeded by rebar)
  - Three borings completed around apparent edge of buried slab
- **Observations**
  - No free product observed in DPT bores or nearby permanent wells
  - Staining, odors and PID peaks observed underneath pad to ~5 ft
- **Continue gauging and bailing recoverable product as an interim response**
  - Evaluate treatment options, considering impact of slab and inability to consistently penetrate
- **Next semiannual groundwater sampling event planned for April 2017**

2016 GROUNDWATER INVESTIGATION SUMMARY

April 2017 Restoration Advisory Board

NWIRP CALVERTON, NEW YORK

April 4, 2017

Facility Map

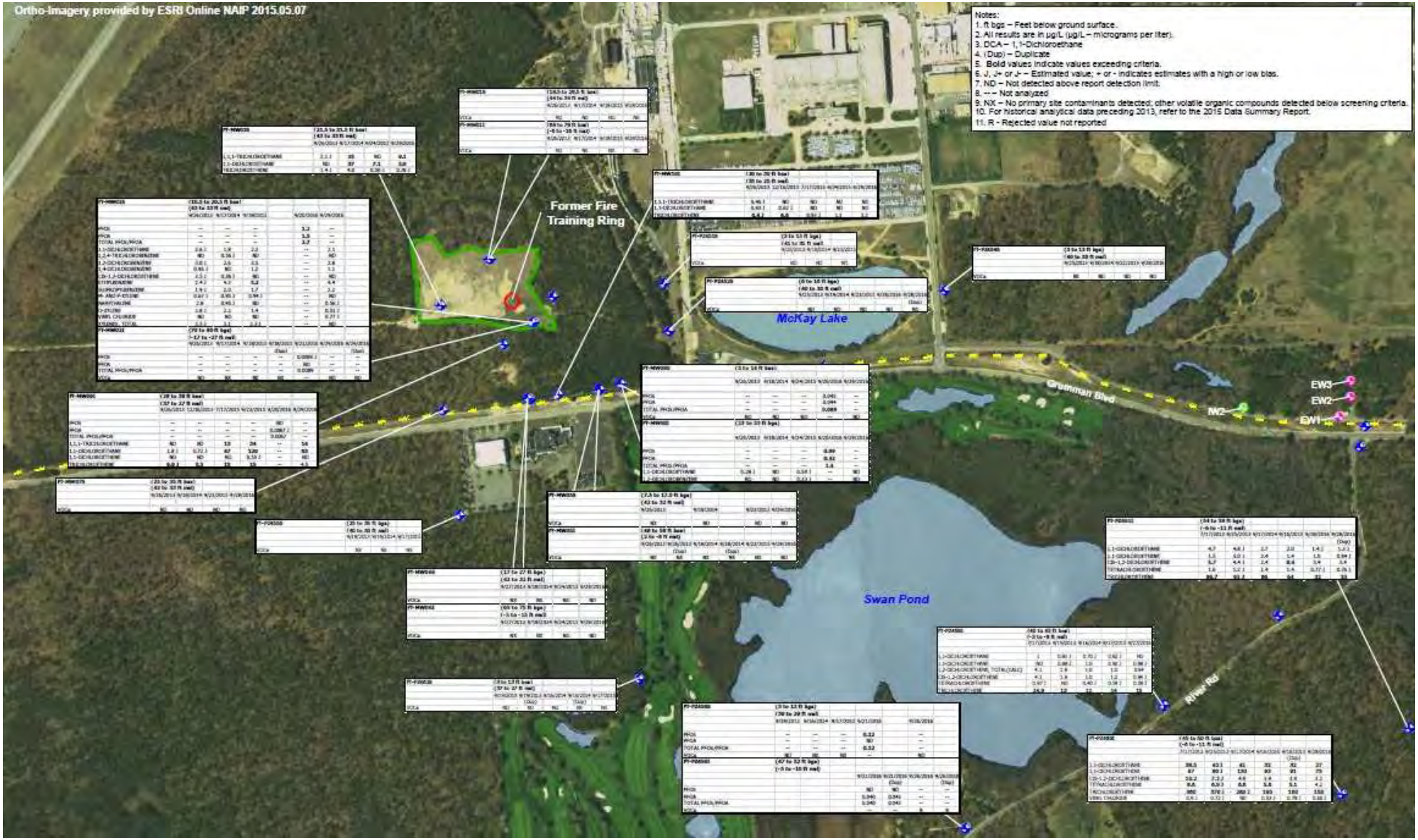
Annual Monitoring Program - VOCs

- **Well & Piezometer Sampling**
  - 74 locations, all sampled in September 2016
  - Site 2 (Fire Training Area)
    - 15 on-property locations, 6 off-property
  - Sites 6A (Fuel Calibration Area)
    - 12 locations
  - Southern Area
    - 21 on-site locations, 17 off-site locations
    - 12 Fence Line Area locations also sampled in May, 1 in December
- **Peconic River Surface Water, Groundwater and Porewater**
  - 4 surface water and porewater locations sampled in May and September
  - 3 upland piezometers sampled in September
- **Water Elevation Gauging**
  - 103 wells/piezometers planned (7 not measured due to damage/access)
  - 7 staff gauges planned (6 locations measured as “dry” – no reading)

Site 2 Groundwater Flow (September 2015)

Site 2 Groundwater Flow (September 2016)

Site 2 Results

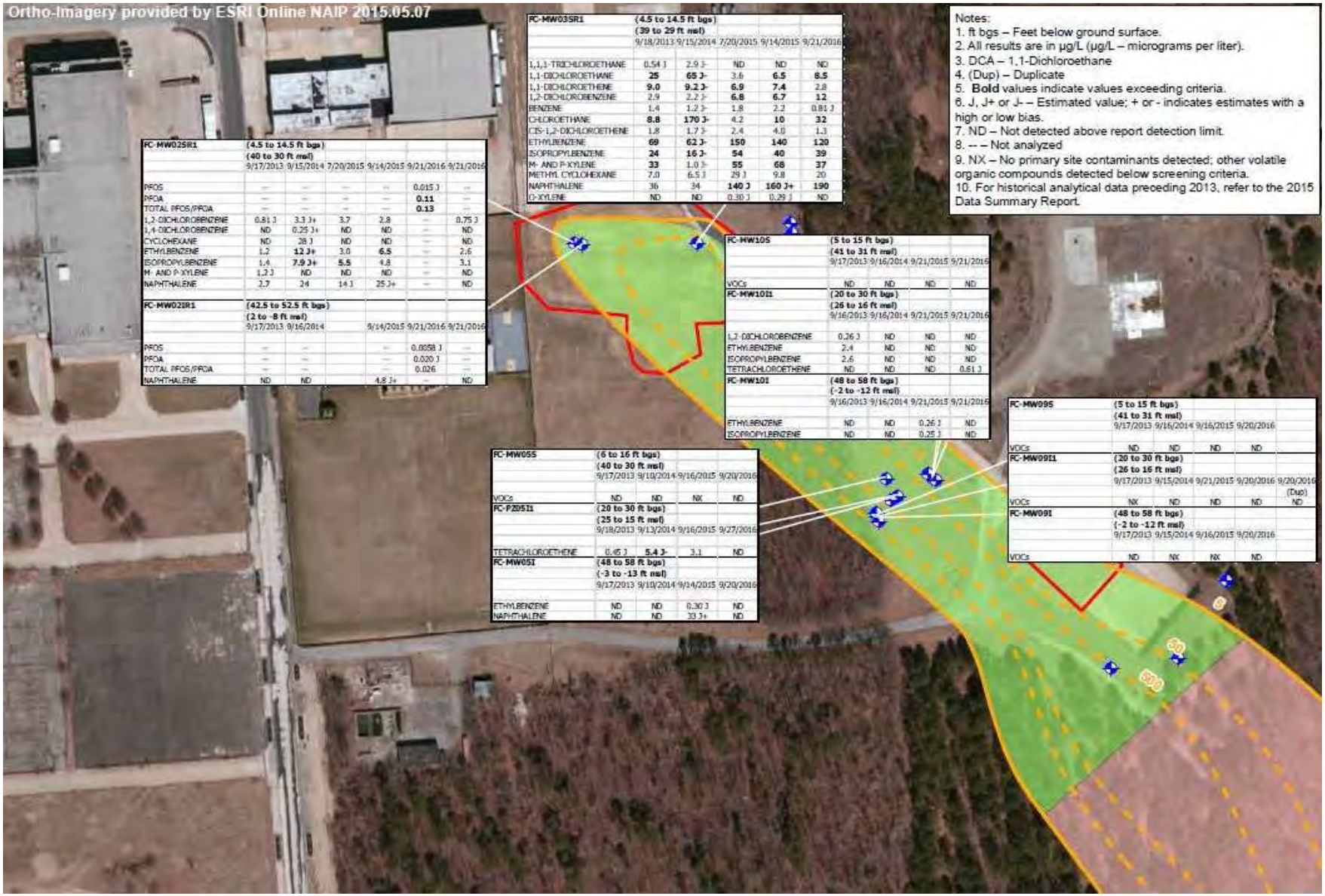


Southern Area Plume Map

Groundwater Flow (September 2015)

Groundwater Flow (September 2016)

Site 6A Source Area Results



FC-MW02SR1	(4.5 to 14.5 ft bgs) (40 to 30 ft msl)					
	9/17/2013	9/15/2014	7/20/2015	9/14/2015	9/21/2016	9/21/2016
PFOS	--	--	--	--	0.015 J	--
PFOA	--	--	--	--	**0.11**	--
TOTAL PFOS/PFOA	--	--	--	--	**0.13**	--
1,2-DICHLOROBENZENE	0.81 J	3.3 J+	3.7	2.8	--	0.75 J
1,4-DICHLOROBENZENE	ND	0.25 J+	ND	ND	--	ND
CYCLOHEXANE	ND	28 J	ND	ND	--	ND
ETHYLBENZENE	1.2	**12 J+**	3.0	**6.5**	--	2.6
ISOPROPYLBENZENE	1.4	**7.9 J+**	**5.5**	4.8	--	3.1
M- AND P-XYLENE	1.2 J	ND	ND	ND	--	ND
NAPHTHALENE	2.7	24	14 J	25 J+	--	ND

FC-MW02IR1	(42.5 to 52.5 ft bgs) (2 to -8 ft msl)				
	9/17/2013	9/16/2014		9/14/2015	9/21/2016	9/21/2016
PFOS	--	--		--	0.0058 J	--
PFOA	--	--		--	0.020 J	--
TOTAL PFOS/PFOA	--	--		--	0.026	--
NAPHTHALENE	ND	ND		4.8 J+	--	ND

FC-MW03SR1	(4.5 to 14.5 ft bgs) (39 to 29 ft msl)				
	9/18/2013	9/15/2014	7/20/2015	9/14/2015	9/21/2016
1,1,1-TRICHLOROETHANE	0.54 J	2.9 J-	ND	ND	ND
1,1-DICHLOROETHANE	**25**	**65 J-**	3.6	**6.5**	**8.5**
1,1-DICHLOROETHENE	**9.0**	**9.2 J-**	**6.9**	**7.4**	2.8
1,2-DICHLOROBENZENE	2.9	2.2 J-	**6.8**	**6.7**	**12**
BENZENE	1.4	1.2 J-	1.8	2.2	0.81 J
CHLOROETHANE	**8.8**	**170 J-**	4.2	**10**	**32**
CIS-1,2-DICHLOROETHENE	1.8	1.7 J-	2.4	4.0	1.3
ETHYLBENZENE	**69**	**62 J-**	**150**	**140**	**120**
ISOPROPYLBENZENE	**24**	**16 J-**	**54**	**40**	**39**
M- AND P-XYLENE	**33**	1.0 J-	**55**	**68**	**37**
METHYL CYCLOHEXANE	7.0	6.5 J	29 J	9.8	20
NAPHTHALENE	36	34	**140 J**	**160 J+**	**190**
O-XYLENE	ND	ND	0.30 J	0.29 J	ND

FC-MW10S	(5 to 15 ft bgs) (41 to 31 ft msl)			
	9/17/2013	9/16/2014	9/21/2015	9/21/2016
VOCs	ND	ND	ND	ND

FC-MW10II	(20 to 30 ft bgs) (26 to 16 ft msl)			
	9/16/2013	9/16/2014	9/21/2015	9/21/2016
1,2-DICHLOROBENZENE	0.26 J	ND	ND	ND
ETHYLBENZENE	2.4	ND	ND	ND
ISOPROPYLBENZENE	2.6	ND	ND	ND
TETRACHLOROETHENE	ND	ND	ND	0.61 J

FC-MW10I	(48 to 58 ft bgs) (-2 to -12 ft msl)			
	9/16/2013	9/16/2014	9/21/2015	9/21/2016
ETHYLBENZENE	ND	ND	0.26 J	ND
ISOPROPYLBENZENE	ND	ND	0.25 J	ND

FC-MW05S	(6 to 16 ft bgs) (40 to 30 ft msl)			
	9/17/2013	9/10/2014	9/16/2015	9/20/2016
VOCs	ND	ND	NX	ND

FC-PZ05II	(20 to 30 ft bgs) (25 to 15 ft msl)			
	9/18/2013	9/13/2014	9/16/2015	9/27/2016
TETRACHLOROETHENE	0.45 J	**5.4 J-**	3.1	ND

FC-MW05I	(48 to 58 ft bgs) (-3 to -13 ft msl)				
	9/17/2013	9/10/2014	9/14/2015	9/20/2016	
ETHYLBENZENE	ND	ND	0.30 J	ND	
NAPHTHALENE	ND	ND	33 J+	ND	

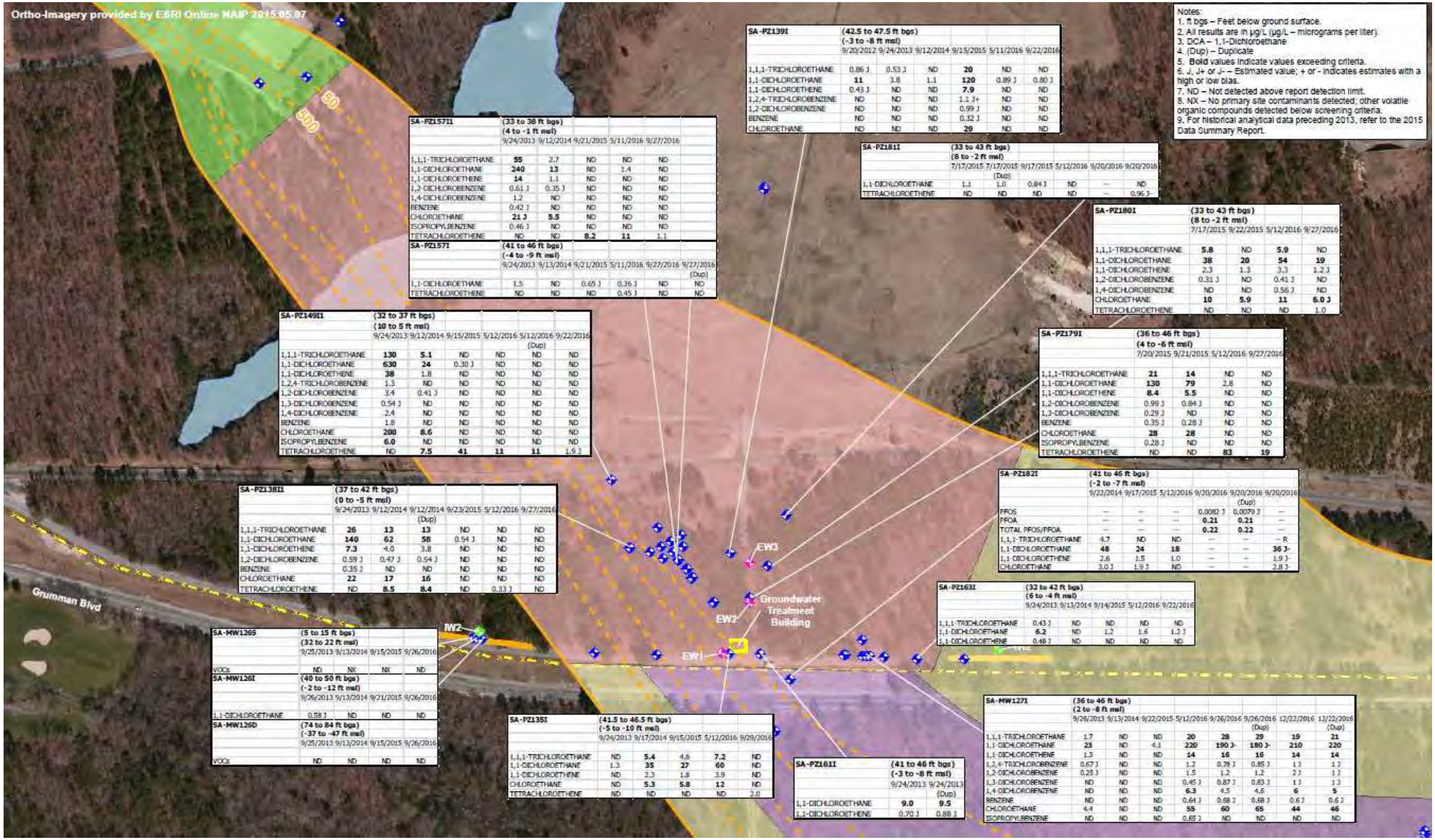
FC-MW09S	(5 to 15 ft bgs) (41 to 31 ft msl)			
	9/17/2013	9/16/2014	9/16/2015	9/20/2016
VOCs	ND	ND	ND	ND

FC-MW09II	(20 to 30 ft bgs) (26 to 16 ft msl)				
	9/17/2013	9/15/2014	9/21/2015	9/20/2016	9/20/2016 (Dup)
VOCs	NX	ND	ND	ND	ND

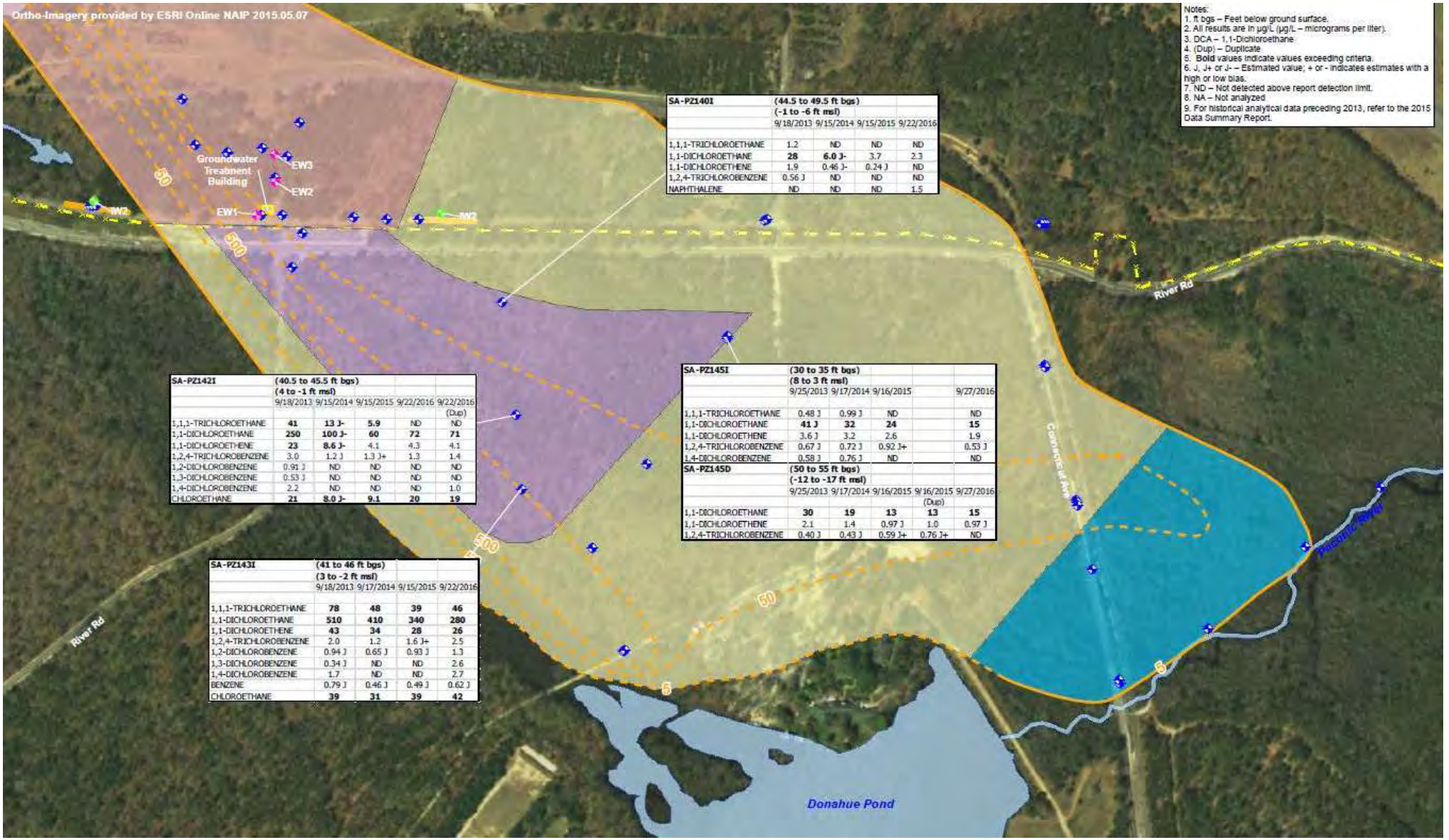
FC-MW09I	(48 to 58 ft bgs) (-2 to -12 ft msl)			
	9/17/2013	9/15/2014	9/16/2015	9/20/2016
VOCs	ND	NX	NX	ND

Notes:
1. ft bgs – Feet below ground surface.
2. All results are in µg/L (µg/L – micrograms per liter).
3. DCA – 1,1-Dichloroethane
4. (Dup) – Duplicate
5. **Bold** values indicate values exceeding criteria.
6. J, J+ or J- – Estimated value; + or - indicates estimates with a high or low bias.
7. ND – Not detected above report detection limit.
8. -- – Not analyzed
9. NX – No primary site contaminants detected; other volatile organic compounds detected below screening criteria.
10. For historical analytical data preceding 2013, refer to the 2015 Data Summary Report.

Fence Line Area Results



Off-Site High Concentration Area Results



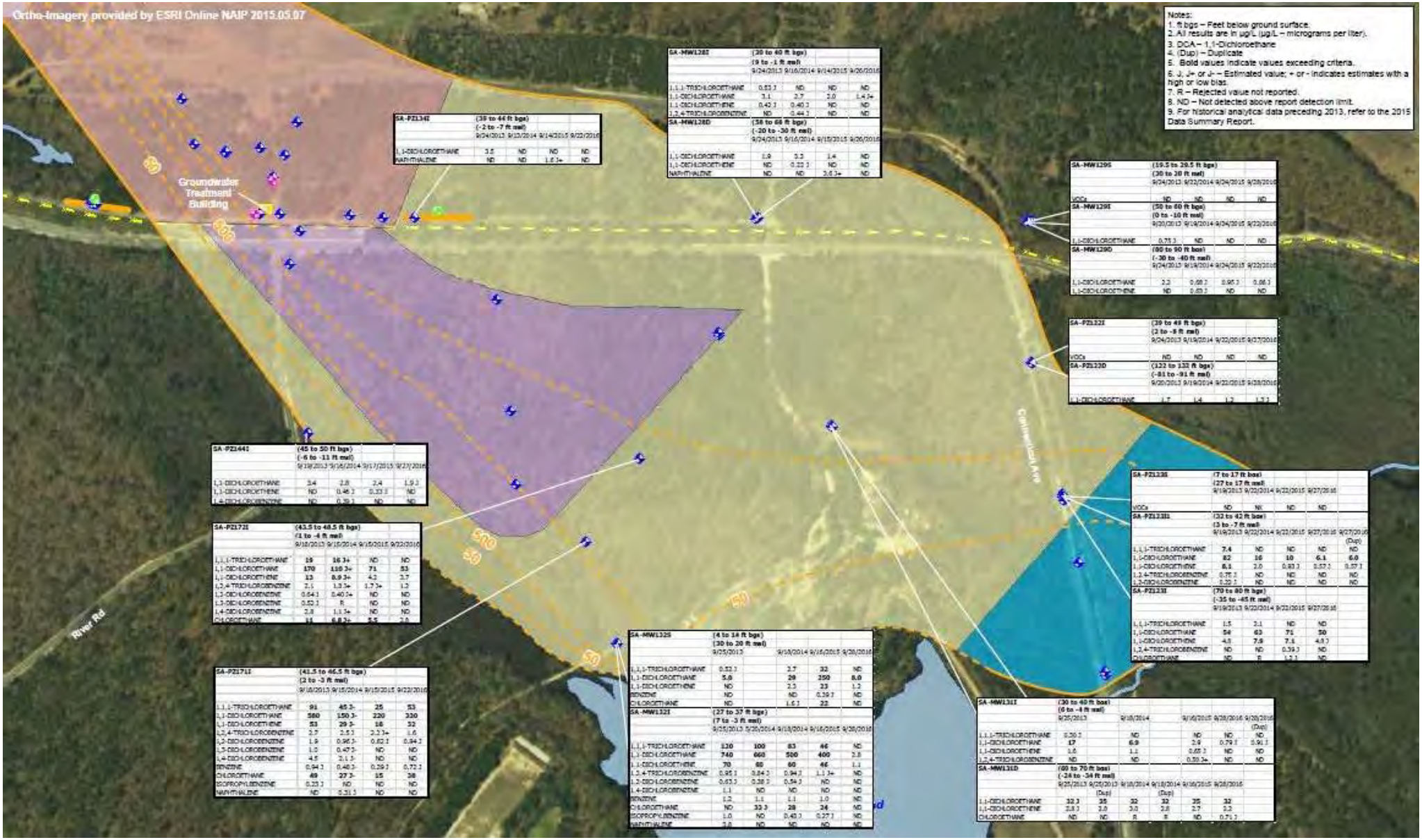
SA-PZ140I	(44.5 to 49.5 ft bgs) (-1 to -6 ft msl)			
	9/18/2013	9/15/2014	9/15/2015	9/22/2016
1,1,1-TRICHLOROETHANE	1.2	ND	ND	ND
1,1-DICHLOROETHANE	**28**	**6.0 J-**	3.7	2.3
1,1-DICHLOROETHENE	1.9	0.46 J-	0.24 J	ND
1,2,4-TRICHLOROBENZENE	0.56 J	ND	ND	ND
NAPHTHALENE	ND	ND	ND	1.5

SA-PZ142I	(40.5 to 45.5 ft bgs) (4 to -1 ft msl)				
	9/18/2013	9/15/2014	9/15/2015	9/22/2016	9/22/2016 (Dup)
1,1,1-TRICHLOROETHANE	**41**	**13 J-**	**5.9**	ND	ND
1,1-DICHLOROETHANE	**250**	**100 J-**	**60**	**72**	**71**
1,1-DICHLOROETHENE	**23**	**8.6 J-**	4.1	4.3	4.1
1,2,4-TRICHLOROBENZENE	3.0	1.2 J	1.3 J+	1.3	1.4
1,2-DICHLOROBENZENE	0.91 J	ND	ND	ND	ND
1,3-DICHLOROBENZENE	0.53 J	ND	ND	ND	ND
1,4-DICHLOROBENZENE	2.2	ND	ND	ND	1.0
CHLOROETHANE	**21**	**8.0 J-**	**9.1**	**20**	**19**

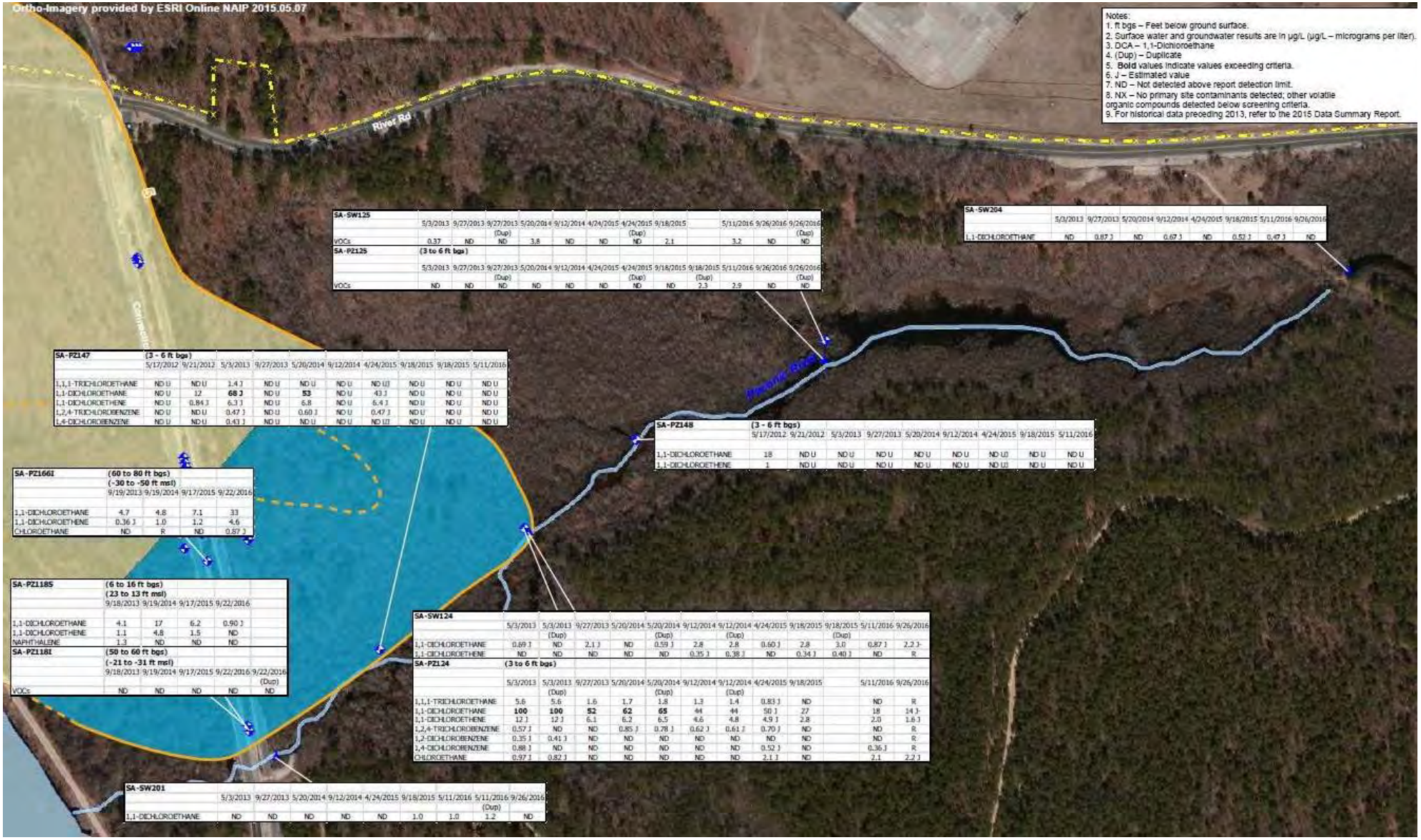
SA-PZ143I	(41 to 46 ft bgs) (3 to -2 ft msl)			
	9/18/2013	9/17/2014	9/15/2015	9/22/2016
1,1,1-TRICHLOROETHANE	**78**	**48**	**39**	**46**
1,1-DICHLOROETHANE	**510**	**410**	**340**	**280**
1,1-DICHLOROETHENE	**43**	**34**	**28**	**26**
1,2,4-TRICHLOROBENZENE	2.0	1.2	1.6 J+	2.5
1,2-DICHLOROBENZENE	0.94 J	0.65 J	0.93 J	1.3
1,3-DICHLOROBENZENE	0.34 J	ND	ND	2.6
1,4-DICHLOROBENZENE	1.7	ND	ND	2.7
BENZENE	0.79 J	0.46 J	0.49 J	0.62 J
CHLOROETHANE	**39**	**31**	**39**	**42**

SA-PZ145I	(30 to 35 ft bgs) (8 to 3 ft msl)				
	9/25/2013	9/17/2014	9/16/2015		9/27/2016
1,1,1-TRICHLOROETHANE	0.48 J	0.99 J	ND		ND
1,1-DICHLOROETHANE	**41 J**	**32**	**24**		**15**
1,1-DICHLOROETHENE	3.6 J	3.2	2.6		1.9
1,2,4-TRICHLOROBENZENE	0.67 J	0.72 J	0.92 J+		0.53 J
1,4-DICHLOROBENZENE	0.58 J	0.76 J	ND		ND
SA-PZ145D	**(50 to 55 ft bgs) (-12 to -17 ft msl)**				
	9/25/2013	9/17/2014	9/16/2015	9/16/2015 (Dup)	9/27/2016
1,1-DICHLOROETHANE	**30**	**19**	**13**	**13**	**15**
1,1-DICHLOROETHENE	2.1	1.4	0.97 J	1.0	0.97 J
1,2,4-TRICHLOROBENZENE	0.40 J	0.43 J	0.59 J+	0.76 J+	ND

Off-Site Low Concentration Area Results



Peconic River Area Results



SA-SW125

	5/3/2013	9/27/2013	9/27/2013 (Dup)	5/20/2014	9/12/2014	4/24/2015	4/24/2015 (Dup)	9/18/2015	5/11/2016	9/26/2016	9/26/2016 (Dup)
VOCs	0.37	ND	ND	3.8	ND	ND	ND	2.1	3.2	ND	ND

SA-PZ125 (3 to 6 ft bgs)

	5/3/2013	9/27/2013	9/27/2013 (Dup)	5/20/2014	9/12/2014	4/24/2015	4/24/2015 (Dup)	9/18/2015	9/18/2015 (Dup)	5/11/2016	9/26/2016	9/26/2016 (Dup)
VOCs	ND	ND	ND	ND	ND	ND	ND	ND	2.3	2.9	ND	ND

SA-SW204

	5/3/2013	9/27/2013	5/20/2014	9/12/2014	4/24/2015	9/18/2015	5/11/2016	9/26/2016
1,1-DICHLOROETHANE	ND	0.87 J	ND	0.67 J	ND	0.52 J	0.47 J	ND

SA-PZ147 (3 - 6 ft bgs)

	5/17/2012	9/21/2012	5/3/2013	9/27/2013	5/20/2014	9/12/2014	4/24/2015	9/18/2015	9/18/2015	5/11/2016
1,1,1-TRICHLOROETHANE	ND U	ND U	1.4 J	ND U	ND U	ND U	ND UJ	ND U	ND U	ND U
1,1-DICHLOROETHANE	ND U	12	**68 J**	ND U	**53**	ND U	43 J	ND U	ND U	ND U
1,1-DICHLOROETHENE	ND U	0.84 J	6.3 J	ND U	6.8	ND U	6.4 J	ND U	ND U	ND U
1,2,4-TRICHLOROBENZENE	ND U	ND U	0.47 J	ND U	0.60 J	ND U	0.47 J	ND U	ND U	ND U
1,4-DICHLOROBENZENE	ND U	ND U	0.43 J	ND U	ND U	ND U	ND UJ	ND U	ND U	ND U

SA-PZ148 (3 - 6 ft bgs)

	5/17/2012	9/21/2012	5/3/2013	9/27/2013	5/20/2014	9/12/2014	4/24/2015	9/18/2015	5/11/2016
1,1-DICHLOROETHANE	18	ND U	ND U	ND U	ND U	ND U	ND UJ	ND U	ND U
1,1-DICHLOROETHENE	1	ND U	ND U	ND U	ND U	ND U	ND UJ	ND U	ND U

SA-PZ166I (60 to 80 ft bgs) (-30 to -50 ft msl)

	9/19/2013	9/19/2014	9/17/2015	9/22/2016
1,1-DICHLOROETHANE	4.7	4.8	7.1	33
1,1-DICHLOROETHENE	0.36 J	1.0	1.2	4.6
CHLOROETHANE	ND	R	ND	0.87 J

SA-PZ118S (6 to 16 ft bgs) (23 to 13 ft msl)

	9/18/2013	9/19/2014	9/17/2015	9/22/2016
1,1-DICHLOROETHANE	4.1	17	6.2	0.90 J
1,1-DICHLOROETHENE	1.1	4.8	1.5	ND
NAPHTHALENE	1.3	ND	ND	ND

SA-PZ118I (50 to 60 ft bgs) (-21 to -31 ft msl)

	9/18/2013	9/19/2014	9/17/2015	9/22/2016	9/22/2016 (Dup)
VOCs	ND	ND	ND	ND	ND

SA-SW124

	5/3/2013	5/3/2013 (Dup)	9/27/2013	5/20/2014	5/20/2014 (Dup)	9/12/2014	9/12/2014 (Dup)	4/24/2015	9/18/2015	9/18/2015 (Dup)	5/11/2016	9/26/2016
1,1-DICHLOROETHANE	0.69 J	ND	2.1 J	ND	0.59 J	2.8	2.8	0.60 J	2.8	3.0	0.87 J	2.2 J-
1,1-DICHLOROETHENE	ND	ND	ND	ND	0.35 J	0.38 J	ND	0.34 J	0.40 J	ND	ND	R

SA-PZ124 (3 to 6 ft bgs)

	5/3/2013	5/3/2013 (Dup)	9/27/2013	5/20/2014	5/20/2014 (Dup)	9/12/2014	9/12/2014 (Dup)	4/24/2015	9/18/2015	5/11/2016	9/26/2016
1,1,1-TRICHLOROETHANE	5.6	5.6	1.6	1.7	1.8	1.3	1.4	0.83 J	ND	ND	R
1,1-DICHLOROETHANE	**100**	**100**	**52**	**62**	**65**	44	44	50 J	27	18	14 J-
1,1-DICHLOROETHENE	12 J	12 J	6.1	6.2	6.5	4.6	4.8	4.9 J	2.8	2.0	1.6 J
1,2,4-TRICHLOROBENZENE	0.57 J	ND	ND	0.85 J	0.78 J	0.62 J	0.61 J	0.70 J	ND	ND	R
1,2-DICHLOROBENZENE	0.35 J	0.41 J	ND	ND	ND	ND	ND	ND	ND	ND	R
1,4-DICHLOROBENZENE	0.88 J	ND	ND	ND	ND	ND	ND	0.52 J	ND	0.36 J	R
CHLOROETHANE	0.97 J	0.82 J	ND	ND	ND	ND	ND	2.1 J	ND	2.1	2.2 J

SA-SW201

	5/3/2013	9/27/2013	5/20/2014	9/12/2014	4/24/2015	9/18/2015	5/11/2016	5/11/2016 (Dup)	9/26/2016
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	1.0	1.0	1.2	ND

Site 2 Summary —2016 Results

- **Site 2 On-property**
  - 11 VOCs detected across 4 of 15 locations
  - MCL exceedances at FT-MW03S (TCA, DCA) and 09I (DCA, TCA)
  - VOC data in this area consistent with prior results
  - PFOS/PFOA detected at all 5 on-property locations analyzed; exceeded EPA Health Advisory at FT-MW02S, 08S, 08I
- **Site 2 Off-property**
  - 9 VOCs detected across 3 of 6 locations
  - 3 MCL exceedances (TCE, DCE and DCA) at FT-PZ460I “anomaly”
  - MCL exceedance (TCE) at FT-PZ458I and FT-PZ461I
  - VOC Data in this area consistent with prior results; anomaly stable
- **Downgradient Residential Sampling**
  - One residential well
  - Sampled in September, then quarterly beginning in December
    - September – PFOS detected at ~10% of health advisory, PFOA not detected
    - Quarterly Results – PFOS/PFOA not detected in December; March sample collected

Site 6A Summary —2016 Results

- **Site 6A**
  - 12 VOCs detected across 3 of 12 locations
  - MCLs exceeded at FC-MW03SR1 for several fuel-related VOCs, DCA and CA
  - Estimated VOC mass flux across FC-MW05/09/10 cluster is 0.2 lbs/yr
  - Results are consistent with recent years; continued elevated VOC levels in historic Source Area
  - Investigation of continued elevated concentrations within removal area completed; results expected May 2017
  - PFOS/PFOA detected at both locations analyzed (FC-MW02SR1 and 02IR1); exceeded EPA Health Advisory at FC-MW02SR1

Southern Area Summary —2016 Results

- **Groundwater —Fence Line Area**
  - FLTS shutdown criteria requires all site-related VOCs be below 50 µg/L in Fence Line Area wells, and less than 2.2 lbs/year VOCs in FLTS influent
  - May
    - 15 VOCs detected across all 12 locations; MCLs exceeded at 7 locations
    - Shutdown criteria exceeded at SA-MW127I, SA-PZ135I and SA-PZ180I
  - September
    - 12 VOCs detected across 10 of 15 locations; MCLs exceeded at 4 locations
    - Shutdown criteria exceeded at SA-MW127I
    - PFOA detected in both locations sampled, above EPA Health Advisory
  - Elevated levels at SA-MW127I may represent stagnated area
    - SA-MW127I sampled in December, exceeded MCLs for 5 VOCs and above shutdown criteria
    - Temporary connection of nearby pump test well to FLTS being considered

Southern Area – 2016 Results (cont'd)

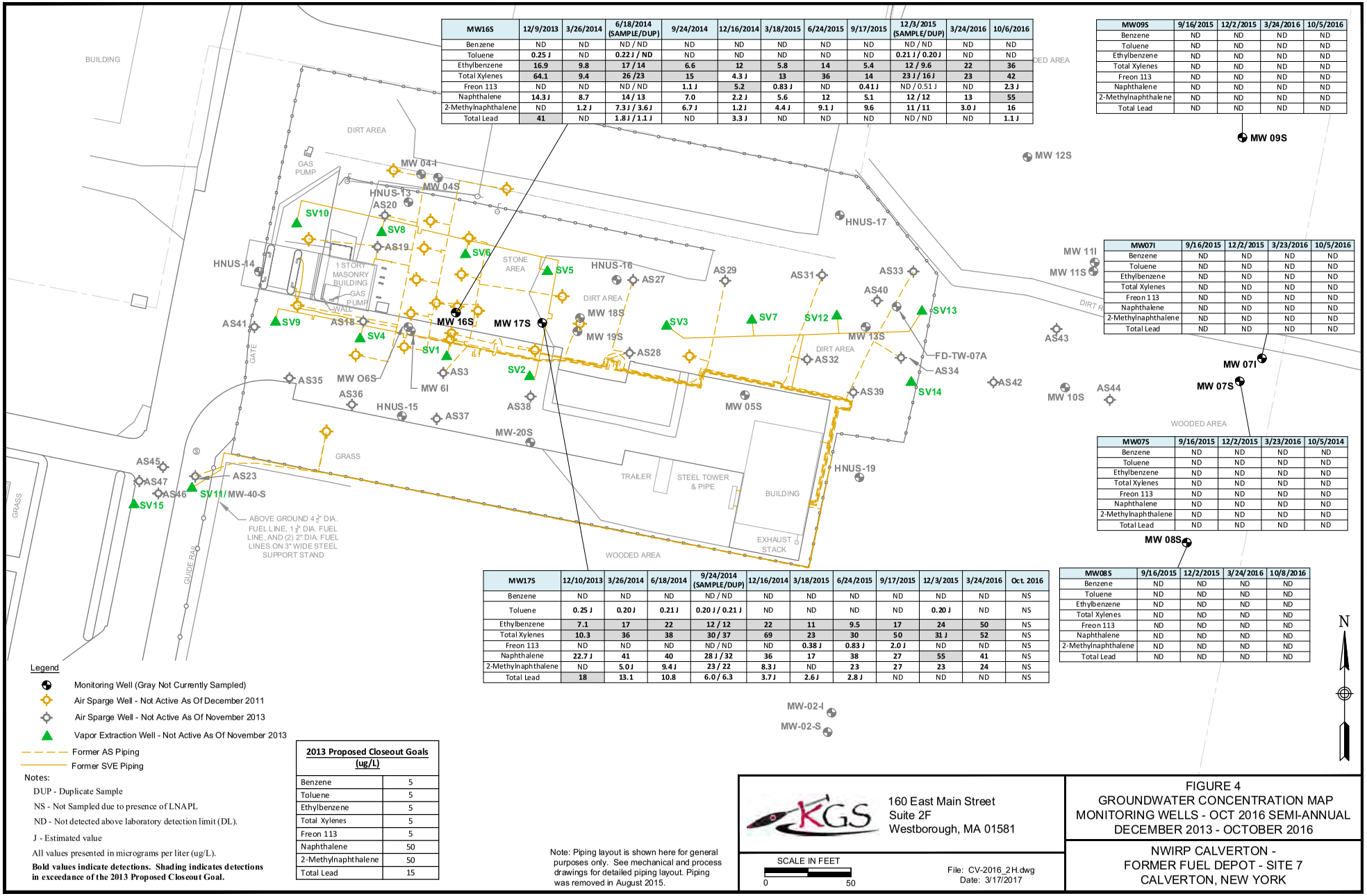
- **Groundwater – Off-Site High Concentration Area**
  - 11 VOCs detected across all 5 locations; MCLs exceeded at 4 locations
  - Results consistent with recent years and show moderate decreasing trend

- **Groundwater – Off-Site Low Concentration Area**
  - 10 VOCs detected across 13 of 18 locations; MCLs exceeded at 6 locations
  - VOC concentrations at SA-MW132S/I declined from 2015
  - Results generally consistent with recent data
  - New wells SA-MW184S/I, SA-MW185S/I and SA-MW186S recently installed on PRSC property; to be sampled in Spring 2017

Southern Area –2016 Results (cont'd)

- **Peconic River Area**
  - Groundwater (September Sampling Only)
    - 3 VOCs detected across 2 of 3 locations
    - No VOCs exceeded RD porewater benchmarks
  - Porewater (May & September Sampling)
    - Excluding acetone (lab contaminant), 5 VOCs detected across SA-PZ124 and SA-PZ125
    - DCA observed at SA-PZ124 only, in May and September
    - No VOCs exceeded RD porewater benchmarks
  - Surface Water (May & September Sampling)
    - Excluding acetone (lab contaminant), 2 VOCs detected across all 4 locations
    - DCA observed at SA-SW124 in May and September, and SA-SW201 and SA-SW2014 in May only
    - All detections were below RD benchmarks

Questions?



MW16S	12/9/2013	3/26/2014	6/18/2014 (SAMPLE/DUP)	9/24/2014	12/16/2014	3/18/2015	6/24/2015	9/17/2015	12/3/2015 (SAMPLE/DUP)	3/24/2016	10/6/2016
Benzene	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND / ND	ND	ND
Toluene	0.25 J	ND	0.22 J / ND	ND	ND	ND	ND	ND	0.21 J / 0.20 J	ND	ND
Ethylbenzene	16.9	9.8	17 / 14	6.6	12	5.8	14	5.4	12 / 9.6	22	36
Total Xylenes	64.1	9.4	26 /23	15	4.3 J	13	36	14	23 J / 16 J	23	42
Freon 113	ND	ND	ND / ND	1.1 J	5.2	0.83 J	ND	0.41 J	ND / 0.51 J	ND	2.3 J
Naphthalene	14.3 J	8.7	14 / 13	7.0	2.2 J	5.6	12	5.1	12 / 12	13	55
2-Methylnaphthalene	ND	1.2 J	7.3 J / 3.6 J	6.7 J	1.2 J	4.4 J	9.1 J	9.6	11 / 11	3.0 J	16
Total Lead	41	ND	1.8 J / 1.1 J	ND	3.3 J	ND	ND	ND	ND / ND	ND	1.1 J

MW09S	9/16/2015	12/2/2015	3/24/2016	10/5/2016
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND

MW07I	9/16/2015	12/2/2015	3/23/2016	10/5/2016
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND

MW07S	9/16/2015	12/2/2015	3/23/2016	10/5/2014
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND

MW17S	12/10/2013	3/26/2014	6/18/2014	9/24/2014 (SAMPLE/DUP)	12/16/2014	3/18/2015	6/24/2015	9/17/2015	12/3/2015	3/24/2016	Oct. 2016
Benzene	ND	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND	NS
Toluene	0.25 J	0.20 J	0.21 J	0.20 J / 0.21 J	ND	ND	ND	ND	0.20 J	ND	NS
Ethylbenzene	7.1	17	22	12 / 12	22	11	9.5	17	24	50	NS
Total Xylenes	10.3	36	38	30 / 37	69	23	30	50	31 J	52	NS
Freon 113	ND	ND	ND	ND / ND	ND	0.38 J	0.83 J	2.0 J	ND	ND	NS
Naphthalene	22.7 J	41	40	28 J / 32	36	17	38	27	55	41	NS
2-Methylnaphthalene	ND	5.0 J	9.4 J	23 / 22	8.3 J	ND	23	27	23	24	NS
Total Lead	18	13.1	10.8	6.0 / 6.3	3.7 J	2.6 J	2.8 J	ND	ND	ND	NS

MW08S	9/16/2015	12/2/2015	3/24/2016	10/8/2016
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND

Legend

- Monitoring Well (Gray Not Currently Sampled)
- Air Sparge Well - Not Active As Of December 2011
- Air Sparge Well - Not Active As Of November 2013
- Vapor Extraction Well - Not Active As Of November 2013
- Former AS Piping
- Former SVE Piping

Notes:

DUP - Duplicate Sample

NS - Not Sampled due to presence of LNAPL

ND - Not detected above laboratory detection limit (DL).

J - Estimated value

All values presented in micrograms per liter (ug/L).

Bold values indicate detections. Shading indicates detections in exceedance of the 2013 Proposed Closeout Goal.

2013 Proposed Closeout Goals (ug/L)	
Benzene	5
Toluene	5
Ethylbenzene	5
Total Xylenes	5
Freon 113	5
Naphthalene	50
2-Methylnaphthalene	50
Total Lead	15

Note: Piping layout is shown here for general purposes only. See mechanical and process drawings for detailed piping layout. Piping was removed in August 2015.

KGS
160 East Main Street
Suite 2F
Westborough, MA 01581

SCALE IN FEET

0 50

File: CV-2016_2H.dwg
Date: 3/17/2017

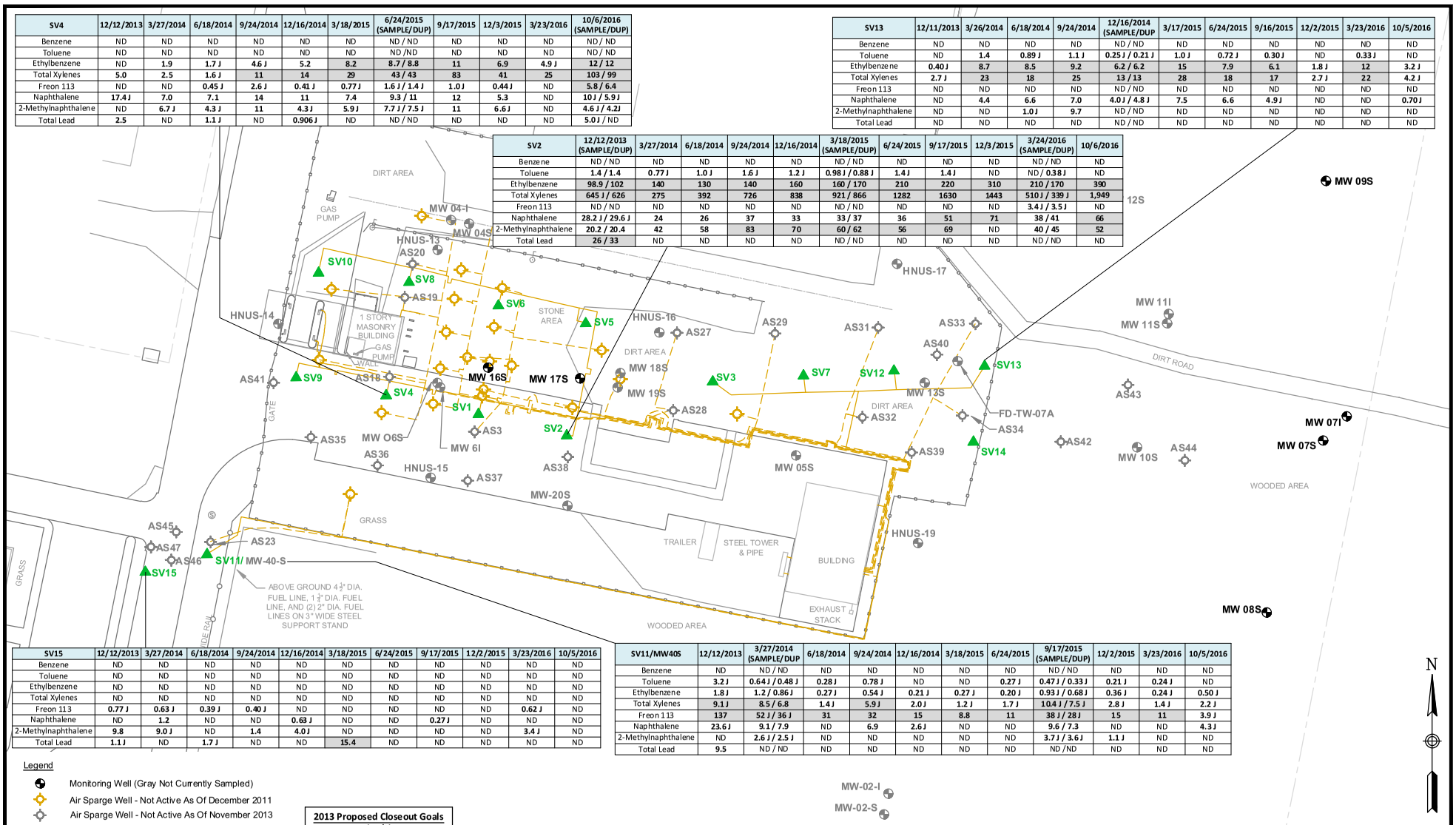
FIGURE 4
GROUNDWATER CONCENTRATION MAP
MONITORING WELLS - OCT 2016 SEMI-ANNUAL
DECEMBER 2013 - OCTOBER 2016

NWIRP CALVERTON -
FORMER FUEL DEPOT - SITE 7
CALVERTON, NEW YORK

SV4	12/12/2013	3/27/2014	6/18/2014	9/24/2014	12/16/2014	3/18/2015	6/24/2015 (SAMPLE/DUP)	9/17/2015	12/3/2015	3/23/2016	10/6/2016 (SAMPLE/DUP)
Benzene	ND	ND	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND / ND
Toluene	ND	ND	ND	ND	ND	ND	ND /ND	ND	ND	ND	ND / ND
Ethylbenzene	ND	1.9	1.7 J	4.6 J	5.2	8.2	8.7 / 8.8	11	6.9	4.9 J	12 / 12
Total Xylenes	5.0	2.5	1.6 J	11	14	29	43 / 43	83	41	25	103 / 99
Freon 113	ND	ND	0.45 J	2.6 J	0.41 J	0.77 J	1.6 J / 1.4 J	1.0 J	0.44 J	ND	5.8 / 6.4
Naphthalene	17.4 J	7.0	7.1	14	11	7.4	9.3 / 11	12	5.3	ND	10 J / 5.9 J
2-Methylnaphthalene	ND	6.7 J	4.3 J	11	4.3 J	5.9 J	7.7 J / 7.5 J	11	6.6 J	ND	4.6 J / 4.2J
Total Lead	2.5	ND	1.1 J	ND	0.906 J	ND	ND / ND	ND	ND	ND	5.0 J / ND

SV13	12/11/2013	3/26/2014	6/18/2014	9/24/2014	12/16/2014 (SAMPLE/DUP	3/17/2015	6/24/2015	9/16/2015	12/2/2015	3/23/2016	10/5/2016
Benzene	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND
Toluene	ND	1.4	0.89 J	1.1 J	0.25 J / 0.21 J	1.0 J	0.72 J	0.30 J	ND	0.33 J	ND
Ethylbenzene	0.40 J	8.7	8.5	9.2	6.2 / 6.2	15	7.9	6.1	1.8 J	12	3.2 J
Total Xylenes	2.7 J	23	18	25	13 / 13	28	18	17	2.7 J	22	4.2 J
Freon 113	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	4.4	6.6	7.0	4.0 J / 4.8 J	7.5	6.6	4.9 J	ND	ND	0.70 J
2-Methylnaphthalene	ND	ND	1.0 J	9.7	ND / ND	ND	ND	ND	ND	ND	ND
Total Lead	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND	ND	ND

SV2	12/12/2013 (SAMPLE/DUP)	3/27/2014	6/18/2014	9/24/2014	12/16/2014	3/18/2015 (SAMPLE/DUP)	6/24/2015	9/17/2015	12/3/2015	3/24/2016 (SAMPLE/DUP)	10/6/2016
Benzene	ND / ND	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND / ND	ND
Toluene	1.4 / 1.4	0.77 J	1.0 J	1.6 J	1.2 J	0.98 J / 0.88 J	1.4 J	1.4 J	ND	ND / 0.38 J	ND
Ethylbenzene	98.9 / 102	140	130	140	160	160 / 170	210	220	310	210 / 170	390
Total Xylenes	645 J / 626	275	392	726	838	921 / 866	1282	1630	1443	510 J / 339 J	1,949
Freon 113	ND / ND	ND	ND	ND	ND	ND / ND	ND	ND	ND	3.4 J / 3.5 J	ND
Naphthalene	28.2 J / 29.6 J	24	26	37	33	33 / 37	36	51	71	38 / 41	66
2-Methylnaphthalene	20.2 / 20.4	42	58	83	70	60 / 62	56	69	ND	40 / 45	52
Total Lead	26 / 33	ND	ND	ND	ND	ND / ND	ND	ND	ND	ND / ND	ND



SV15	12/12/2013	3/27/2014	6/18/2014	9/24/2014	12/16/2014	3/18/2015	6/24/2015	9/17/2015	12/2/2015	3/23/2016	10/5/2016
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Freon 113	0.77 J	0.63 J	0.39 J	0.40 J	ND	ND	ND	ND	ND	0.62 J	ND
Naphthalene	ND	1.2	ND	ND	0.63 J	ND	ND	0.27 J	ND	ND	ND
2-Methylnaphthalene	9.8	9.0 J	ND	1.4	4.0 J	ND	ND	ND	ND	3.4 J	ND
Total Lead	1.1 J	ND	1.7 J	ND	ND	15.4	ND	ND	ND	ND	ND

SV11/MW40S	12/12/2013	3/27/2014 (SAMPLE/DUP	6/18/2014	9/24/2014	12/16/2014	3/18/2015	6/24/2015	9/17/2015 (SAMPLE/DUP)	12/2/2015	3/23/2016	10/5/2016
Benzene	ND	ND / ND	ND	ND	ND	ND	ND	ND / ND	ND	ND	ND
Toluene	3.2 J	0.64 J / 0.48 J	0.28 J	0.78 J	ND	ND	0.27 J	0.47 J / 0.33 J	0.21 J	0.24 J	ND
Ethylbenzene	1.8 J	1.2 / 0.86 J	0.27 J	0.54 J	0.21 J	0.27 J	0.20 J	0.93 J / 0.68 J	0.36 J	0.24 J	0.50 J
Total Xylenes	9.1 J	8.5 / 6.8	1.4 J	5.9 J	2.0 J	1.2 J	1.7 J	10.4 J / 7.5 J	2.8 J	1.4 J	2.2 J
Freon 113	137	52 J / 36 J	31	32	15	8.8	11	38 J / 28 J	15	11	3.9 J
Naphthalene	23.6 J	9.1 / 7.9	ND	6.9	2.6 J	ND	ND	9.6 / 7.3	ND	ND	4.3 J
2-Methylnaphthalene	ND	2.6 J / 2.5 J	ND	ND	ND	ND	ND	3.7 J / 3.6 J	1.1 J	ND	ND
Total Lead	9.5	ND / ND	ND	ND	ND	ND	ND	ND /ND	ND	ND	ND

Legend

- Monitoring Well (Gray Not Currently Sampled)
- Air Sparge Well - Not Active As Of December 2011
- Air Sparge Well - Not Active As Of November 2013
- Vapor Extraction Well - Not Active As Of November 2013
- Former AS Piping
- Former SVE Piping

Notes:

DUP - Duplicate Sample
ND - Not detected above laboratory detection limit (DL).
J - Estimated value
All values presented in micrograms per liter (ug/L).
Bold values indicate detections. Shading indicates detections in exceedance of the 2013 Proposed Closeout Goal.

2013 Proposed Closeout Goals (ug/L)	
Benzene	5
Toluene	5
Ethylbenzene	5
Total Xylenes	5
Freon 113	5
Naphthalene	50
2-Methylnaphthalene	50
Total Lead	15

Note: Piping layout is shown here for general purposes only. See mechanical and process drawings for detailed piping layout. Piping was removed in August 2015.

KGS
160 East Main Street
Suite 2F
Westborough, MA 01581

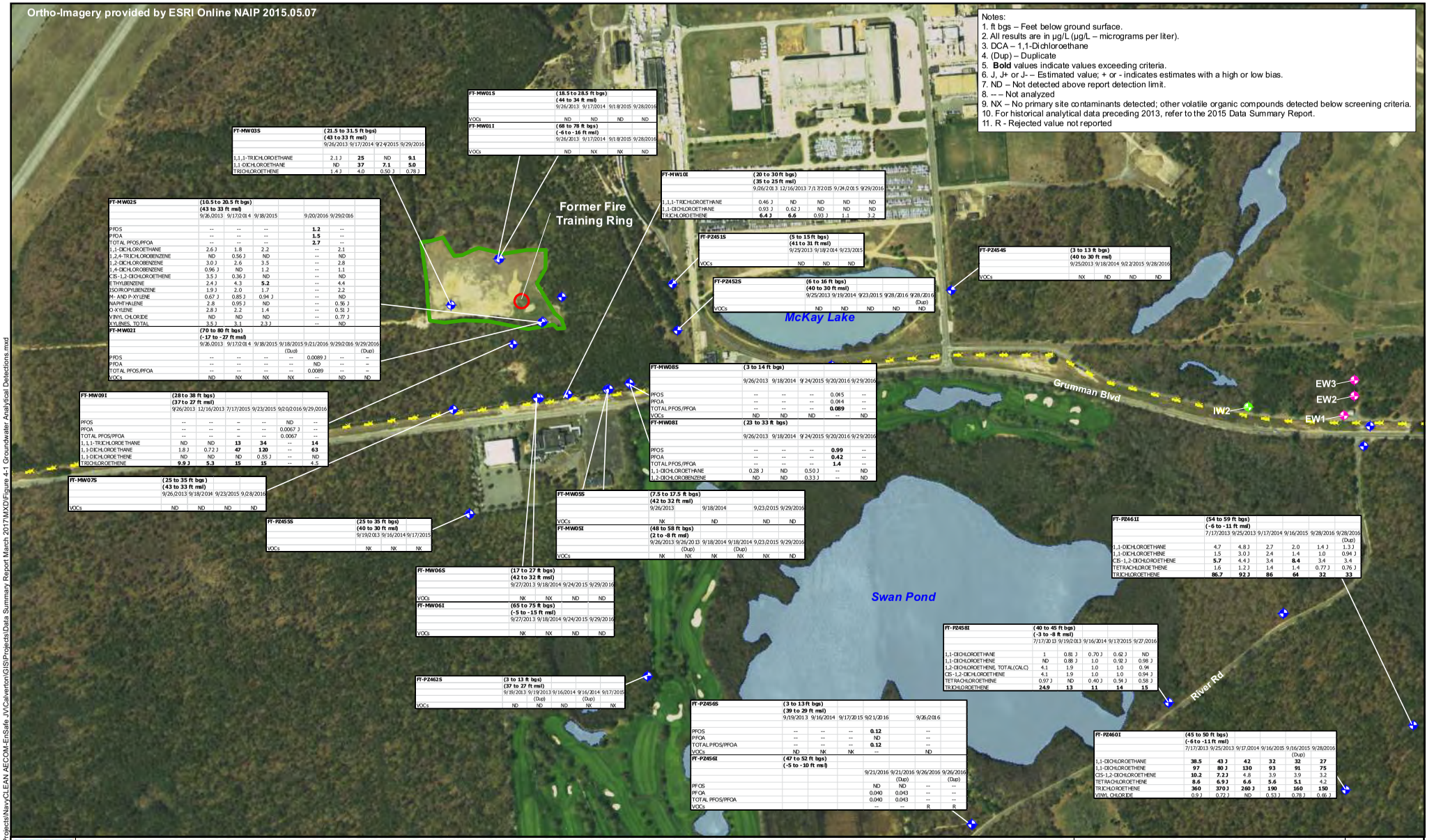
SCALE IN FEET
0 50

File: CV-2016_2H.dwg
Date: 3/17/2017

FIGURE 5
GROUNDWATER CONCENTRATION MAP
SVE WELLS - OCT 2016 SEMI-ANNUAL
DECEMBER 2013 - OCTOBER 2016

NWIRP CALVERTON -
FORMER FUEL DEPOT - SITE 7
CALVERTON, NEW YORK


Ortho-Imagery provided by ESRI Online NAIP 2015.05.07
Former Fire Training Ring
FT-MW01S
FT-MW03S
FT-MW02S
FT-MW09I
FT-MW06S
FT-MW10I
FT-MW08S
FT-MW07S
FT-MW05S
FT-PZ451S
FT-PZ452S
McKay Lake
FT-PZ454S
FTSG10
FT-PZ453S
FTSG11
SA-MW130S
SA-PZ181I
SA-PZ157I
SA-PZ138I
SA-PZ137I
EW3
EW2
EW1
SA-PZ134I
SA-MW126S
SA-PZ135I
SA-PZ163I
Grumman Blvd
FT-PZ455S
Swan Pond
SA-PZ144S
FT-PZ459S
FT-PZ462S
FT-PZ458S
River Rd
FT-PZ461I
FTSG13
FTSG12
FT-PZ457S
FT-PZ460I
FT-PZ456S
37
36
35
34
33
32
31
30
Legend
Existing Extraction Well
Monitoring Well/Piezometer
New Extraction Well
Former Fire Training Ring
Water
Staff Gauge
Fence Line
Flow Direction
Groundwater Elevation Contour (Feet MSL)
Groundwater Elevation Contour (Inferred) (Feet MSL)
Infiltration Gallery
DRAFT
400
200
0
Feet
Groundwater Contours
September 2016
Site 2 - Fire Training Area
NWIRP Calverton
Calverton, New York
Figure 4-2
Date: 4/3/2017
Project #: 60264489
File: P:\Projects\Govt\Projects\NavyCLEAN AECOM-EnSafe JV\Calverton\GIS\Projects\Data Summary Report March 2017\MXD\Figure 4-2 Groundwater Contours Map September 2016.mxd



Notes:
1. ft bgs – Feet below ground surface.
2. All results are in µg/L (µg/L – micrograms per liter).
3. DCA – 1,1-Dichloroethane
4. (Dup) – Duplicate
5. **Bold** values indicate values exceeding criteria.
6. J, J+ or J- – Estimated value; + or - indicates estimates with a high or low bias.
7. ND – Not detected above report detection limit.
8. -- – Not analyzed
9. NX – No primary site contaminants detected; other volatile organic compounds detected below screening criteria.
10. For historical analytical data preceding 2013, refer to the 2015 Data Summary Report.
11. R - Rejected value not reported

Legend

New Extraction Well · Existing Extraction Well · Site Boundary · Water
Injection Well · Monitoring Well/Piezometer · Former Fire Training Ring · Fence Line

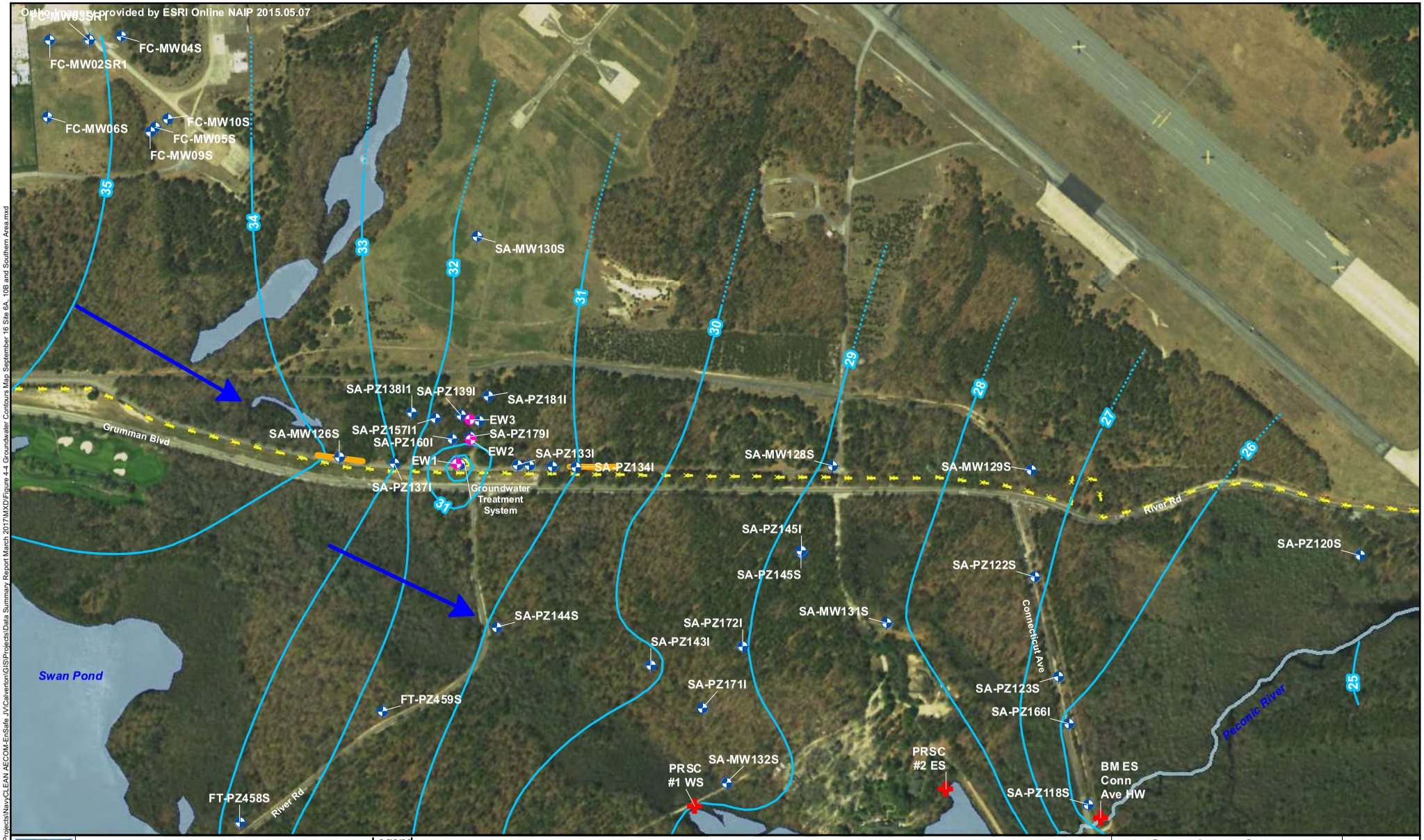
DRAFT

400 200 0 Feet

Groundwater Analytical Detections
Site 2 - Fire Training Area
NWIRP Calverton
Calverton, New York

Figure 4-1
Date: 4/3/2017
Project #: 60264489

File: P:\Projects\Govt\Projects\NavyCLEAN AECOM-EnSafe JV\Calverton\GIS\Projects\Data Summary Report March 2017\MXD\Figure 4-1 Groundwater Analytical Detections.mxd



File: P:\Projects\Govt\Projects\NavyCLEAN AECOM-EnSafe JV\Calverton\GIS\Projects\Data Summary Report March 2017\MXD\Figure 4-4 Groundwater Contours Map September 16 Site 6A, 10B and Southern Area.mxd

Legend

- Existing Extraction Well
- New Extraction Well
- Monitoring Well/Piezometer
- Water
- Staff Gauge
- Fence Line
- Flow Direction
- Groundwater Elevation Contour (Feet MSL)
- Groundwater Elevation Contour (Inferred) (Feet MSL)
- Infiltration Gallery

DRAFT

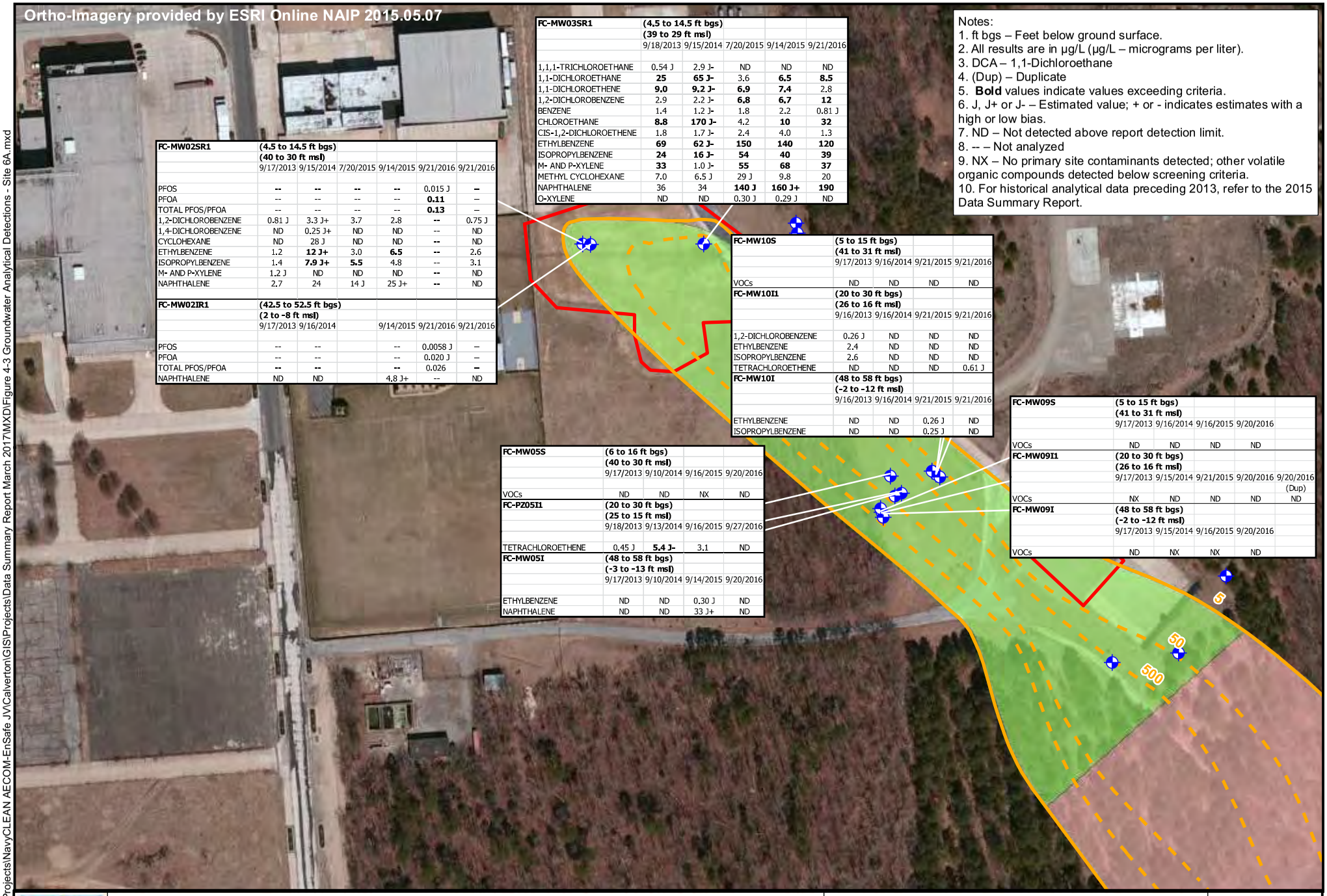
400 200 0 Feet

Groundwater Contours September 2016 Site 6A and Southern Area NWIRP Calverton Calverton, New York

Figure 4-4

Date: 4/3/2017

Project #: 60264489



FC-MW02SR1	(4.5 to 14.5 ft bgs)					
	(40 to 30 ft msl)					
	9/17/2013	9/15/2014	7/20/2015	9/14/2015	9/21/2016	9/21/2016
PFOS	--	--	--	--	0.015 J	--
PFOA	--	--	--	--	**0.11**	--
TOTAL PFOS/PFOA	--	--	--	--	**0.13**	--
1,2-DICHLOROBENZENE	0.81 J	3.3 J+	3.7	2.8	--	0.75 J
1,4-DICHLOROBENZENE	ND	0.25 J+	ND	ND	--	ND
CYCLOHEXANE	ND	28 J	ND	ND	--	ND
ETHYLBENZENE	1.2	**12 J+**	3.0	**6.5**	--	2.6
ISOPROPYLBENZENE	1.4	**7.9 J+**	**5.5**	4.8	--	3.1
M- AND P-XYLENE	1.2 J	ND	ND	ND	--	ND
NAPHTHALENE	2.7	24	14 J	25 J+	--	ND

FC-MW02IR1	(42.5 to 52.5 ft bgs)					
	(2 to -8 ft msl)					
	9/17/2013	9/16/2014		9/14/2015	9/21/2016	9/21/2016
PFOS	--	--		--	0.0058 J	--
PFOA	--	--		--	0.020 J	--
TOTAL PFOS/PFOA	--	--		--	0.026	--
NAPHTHALENE	ND	ND		4.8 J+	--	ND

FC-MW03SR1	(4.5 to 14.5 ft bgs)				
	(39 to 29 ft msl)				
	9/18/2013	9/15/2014	7/20/2015	9/14/2015	9/21/2016
1,1,1-TRICHLOROETHANE	0.54 J	2.9 J-	ND	ND	ND
1,1-DICHLOROETHANE	**25**	**65 J-**	3.6	**6.5**	**8.5**
1,1-DICHLOROETHENE	**9.0**	**9.2 J-**	**6.9**	**7.4**	2.8
1,2-DICHLOROBENZENE	2.9	2.2 J-	**6.8**	**6.7**	**12**
BENZENE	1.4	1.2 J-	1.8	2.2	0.81 J
CHLOROETHANE	**8.8**	**170 J-**	4.2	**10**	**32**
CIS-1,2-DICHLOROETHENE	1.8	1.7 J-	2.4	4.0	1.3
ETHYLBENZENE	**69**	**62 J-**	**150**	**140**	**120**
ISOPROPYLBENZENE	**24**	**16 J-**	**54**	**40**	**39**
M- AND P-XYLENE	**33**	1.0 J-	**55**	**68**	**37**
METHYL CYCLOHEXANE	7.0	6.5 J	29 J	9.8	20
NAPHTHALENE	36	34	**140 J**	**160 J+**	**190**
O-XYLENE	ND	ND	0.30 J	0.29 J	ND

FC-MW10S	(5 to 15 ft bgs)			
	(41 to 31 ft msl)			
	9/17/2013	9/16/2014	9/21/2015	9/21/2016
VOCs	ND	ND	ND	ND
FC-MW10I1	**(20 to 30 ft bgs)**			
	(26 to 16 ft msl)			
	9/16/2013	9/16/2014	9/21/2015	9/21/2016
1,2-DICHLOROBENZENE	0.26 J	ND	ND	ND
ETHYLBENZENE	2.4	ND	ND	ND
ISOPROPYLBENZENE	2.6	ND	ND	ND
TETRACHLOROETHENE	ND	ND	ND	0.61 J
FC-MW10I	**(48 to 58 ft bgs)**			
	(-2 to -12 ft msl)			
	9/16/2013	9/16/2014	9/21/2015	9/21/2016
ETHYLBENZENE	ND	ND	0.26 J	ND
ISOPROPYLBENZENE	ND	ND	0.25 J	ND

FC-MW05S	(6 to 16 ft bgs)			
	(40 to 30 ft msl)			
	9/17/2013	9/10/2014	9/16/2015	9/20/2016
VOCs	ND	ND	NX	ND
FC-PZ05I1	**(20 to 30 ft bgs)**			
	(25 to 15 ft msl)			
	9/18/2013	9/13/2014	9/16/2015	9/27/2016
TETRACHLOROETHENE	0.45 J	**5.4 J-**	3.1	ND
FC-MW05I	**(48 to 58 ft bgs)**			
	(-3 to -13 ft msl)			
	9/17/2013	9/10/2014	9/14/2015	9/20/2016
ETHYLBENZENE	ND	ND	0.30 J	ND
NAPHTHALENE	ND	ND	33 J+	ND

FC-MW09S	(5 to 15 ft bgs)				
	(41 to 31 ft msl)				
	9/17/2013	9/16/2014	9/16/2015	9/20/2016	
VOCs	ND	ND	ND	ND	
FC-MW09I1	**(20 to 30 ft bgs)**				
	(26 to 16 ft msl)				
	9/17/2013	9/15/2014	9/21/2015	9/20/2016	9/20/2016 (Dup)
VOCs	NX	ND	ND	ND	ND
FC-MW09I	**(48 to 58 ft bgs)**				
	(-2 to -12 ft msl)				
	9/17/2013	9/15/2014	9/16/2015	9/20/2016	
VOCs	ND	NX	NX	ND	

Notes:
1. ft bgs – Feet below ground surface.
2. All results are in µg/L (µg/L – micrograms per liter).
3. DCA – 1,1-Dichloroethane
4. (Dup) – Duplicate
5. **Bold** values indicate values exceeding criteria.
6. J, J+ or J- – Estimated value; + or - indicates estimates with a high or low bias.
7. ND – Not detected above report detection limit.
8. -- – Not analyzed
9. NX – No primary site contaminants detected; other volatile organic compounds detected below screening criteria.
10. For historical analytical data preceding 2013, refer to the 2015 Data Summary Report.

Legend

- Monitoring Well/Piezometer
- 1,1 - DCA Contour ug/L
- 1,1 - DCA Contour ug/L (Inferred)
- Excavation Area 2009/2010
- Fence Line Area
- Source Area

DRAFT

200 100 0 Feet

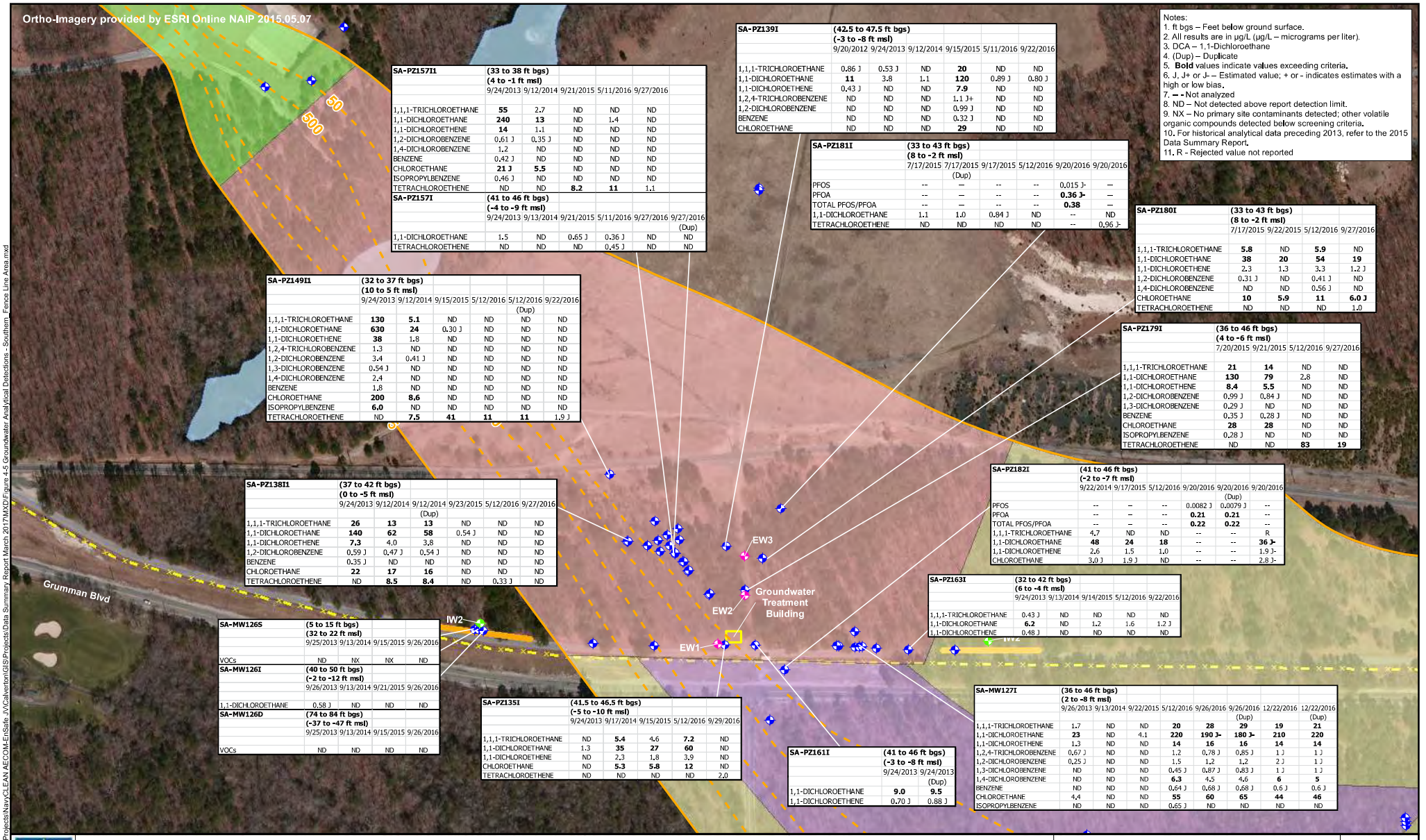
Groundwater Analytical Detections
Site 6A - Fuel Calibration Area
NWIRP Calverton
Calverton, New York

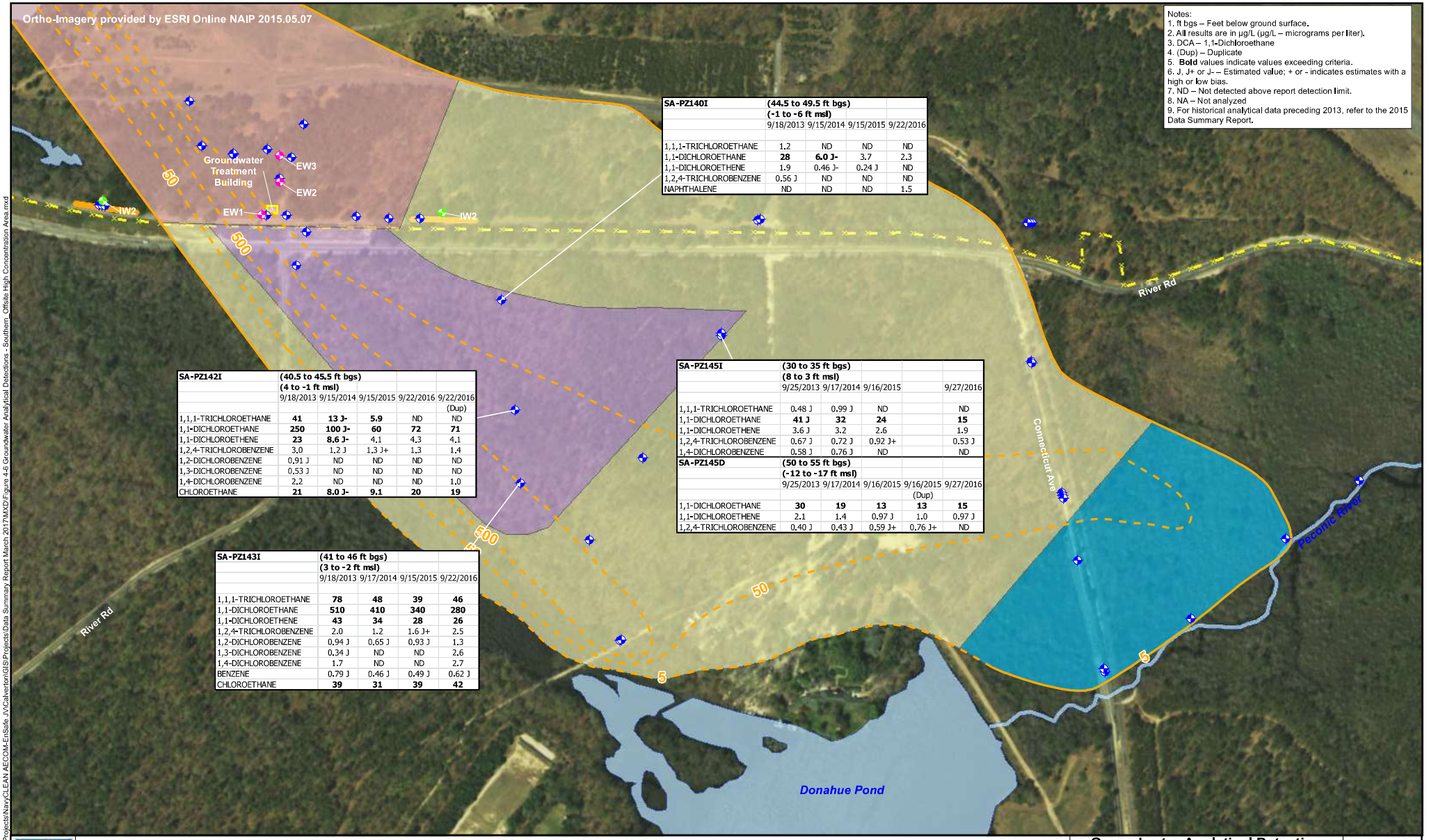
Figure 4-3

Date: 4/3/2017

Project #: 60264489

File: P:\Projects\Govt\Projects\NavyCLEAN AECOM-EnSafe JV\Calverton\GIS\Projects\Data Summary Report March 2017\MXD\Figure 4-3 Groundwater Analytical Detections - Site 6A.mxd


Ortho-Imagery provided by ESRI Online NAIP 2015.05.07
50
500
Grumman Blvd
IW2
EW1
EW2
EW3
Groundwater Treatment Building
Notes:
1. ft bgs – Feet below ground surface.
2. All results are in µg/L (µg/L – micrograms per liter).
3. DCA – 1,1-Dichloroethane
4. (Dup) – Duplicate
5. Bold values indicate values exceeding criteria.
6. J, J+ or J- – Estimated value; + or - indicates estimates with a high or low bias.
7. – - Not analyzed
8. ND – Not detected above report detection limit.
9. NX – No primary site contaminants detected; other volatile organic compounds detected below screening criteria.
10. For historical analytical data preceding 2013, refer to the 2015 Data Summary Report.
11. R - Rejected value not reported
SA-PZ157I1 (33 to 38 ft bgs) (4 to -1 ft msl)
9/24/2013 9/12/2014 9/21/2015 5/11/2016 9/27/2016
1,1,1-TRICHLOROETHANE 55 2.7 ND ND ND
1,1-DICHLOROETHANE 240 13 ND 1.4 ND
1,1-DICHLOROETHENE 14 1.1 ND ND ND
1,2-DICHLOROBENZENE 0.61 J 0.35 J ND ND ND
1,4-DICHLOROBENZENE 1.2 ND ND ND ND
BENZENE 0.42 J ND ND ND ND
CHLOROETHANE 21 J 5.5 ND ND ND
ISOPROPYLBENZENE 0.46 J ND ND ND ND
TETRACHLOROETHENE ND ND 8.2 11 1.1
SA-PZ157I (41 to 46 ft bgs) (-4 to -9 ft msl)
9/24/2013 9/13/2014 9/21/2015 5/11/2016 9/27/2016 9/27/2016 (Dup)
1,1-DICHLOROETHANE 1.5 ND 0.65 J 0.36 J ND ND
TETRACHLOROETHENE ND ND ND 0.45 J ND ND
SA-PZ139I (42.5 to 47.5 ft bgs) (-3 to -8 ft msl)
9/20/2012 9/24/2013 9/12/2014 9/15/2015 5/11/2016 9/22/2016
1,1,1-TRICHLOROETHANE 0.86 J 0.53 J ND 20 ND ND
1,1-DICHLOROETHANE 11 3.8 1.1 120 0.89 J 0.80 J
1,1-DICHLOROETHENE 0.43 J ND ND 7.9 ND ND
1,2,4-TRICHLOROBENZENE ND ND ND 1.1 J+ ND ND
1,2-DICHLOROBENZENE ND ND ND 0.99 J ND ND
BENZENE ND ND ND 0.32 J ND ND
CHLOROETHANE ND ND ND 29 ND ND
SA-PZ181I (33 to 43 ft bgs) (8 to -2 ft msl)
7/17/2015 7/17/2015 (Dup) 9/17/2015 5/12/2016 9/20/2016 9/20/2016
PFOS -- -- -- -- 0.015 J- --
PFOA -- -- -- -- 0.36 J- --
TOTAL PFOS/PFOA -- -- -- -- 0.38 --
1,1-DICHLOROETHANE 1.1 1.0 0.84 J ND -- ND
TETRACHLOROETHENE ND ND ND ND -- 0.96 J-
SA-PZ180I (33 to 43 ft bgs) (8 to -2 ft msl)
7/17/2015 9/22/2015 5/12/2016 9/27/2016
1,1,1-TRICHLOROETHANE 5.8 ND 5.9 ND
1,1-DICHLOROETHANE 38 20 54 19
1,1-DICHLOROETHENE 2.3 1.3 3.3 1.2 J
1,2-DICHLOROBENZENE 0.31 J ND 0.41 J ND
1,4-DICHLOROBENZENE ND ND 0.56 J ND
CHLOROETHANE 10 5.9 11 6.0 J
TETRACHLOROETHENE ND ND ND 1.0
SA-PZ149I1 (32 to 37 ft bgs) (10 to 5 ft msl)
9/24/2013 9/12/2014 9/15/2015 5/12/2016 5/12/2016 (Dup) 9/22/2016
1,1,1-TRICHLOROETHANE 130 5.1 ND ND ND ND
1,1-DICHLOROETHANE 630 24 0.30 J ND ND ND
1,1-DICHLOROETHENE 38 1.8 ND ND ND ND
1,2,4-TRICHLOROBENZENE 1.3 ND ND ND ND ND
1,2-DICHLOROBENZENE 3.4 0.41 J ND ND ND ND
1,3-DICHLOROBENZENE 0.54 J ND ND ND ND ND
1,4-DICHLOROBENZENE 2.4 ND ND ND ND ND
BENZENE 1.8 ND ND ND ND ND
CHLOROETHANE 200 8.6 ND ND ND ND
ISOPROPYLBENZENE 6.0 ND ND ND ND ND
TETRACHLOROETHENE ND 7.5 41 11 11 1.9 J
SA-PZ179I (36 to 46 ft bgs) (4 to -6 ft msl)
7/20/2015 9/21/2015 5/12/2016 9/27/2016
1,1,1-TRICHLOROETHANE 21 14 ND ND
1,1-DICHLOROETHANE 130 79 2.8 ND
1,1-DICHLOROETHENE 8.4 5.5 ND ND
1,2-DICHLOROBENZENE 0.99 J 0.84 J ND ND
1,3-DICHLOROBENZENE 0.29 J ND ND ND
BENZENE 0.35 J 0.28 J ND ND
CHLOROETHANE 28 28 ND ND
ISOPROPYLBENZENE 0.28 J ND ND ND
TETRACHLOROETHENE ND ND 83 19
SA-PZ138I1 (37 to 42 ft bgs) (0 to -5 ft msl)
9/24/2013 9/12/2014 9/12/2014 (Dup) 9/23/2015 5/12/2016 9/27/2016
1,1,1-TRICHLOROETHANE 26 13 13 ND ND ND
1,1-DICHLOROETHANE 140 62 58 0.54 J ND ND
1,1-DICHLOROETHENE 7.3 4.0 3.8 ND ND ND
1,2-DICHLOROBENZENE 0.59 J 0.47 J 0.54 J ND ND ND
BENZENE 0.35 J ND ND ND ND ND
CHLOROETHANE 22 17 16 ND ND ND
TETRACHLOROETHENE ND 8.5 8.4 ND 0.33 J ND
SA-PZ182I (41 to 46 ft bgs) (-2 to -7 ft msl)
9/22/2014 9/17/2015 5/12/2016 9/20/2016 9/20/2016 (Dup) 9/20/2016
PFOS -- -- -- 0.0082 J 0.0079 J --
PFOA -- -- -- 0.21 0.21 --
TOTAL PFOS/PFOA -- -- -- 0.22 0.22 --
1,1,1-TRICHLOROETHANE 4.7 ND ND -- -- R
1,1-DICHLOROETHANE 48 24 18 -- -- 36 J-
1,1-DICHLOROETHENE 2.6 1.5 1.0 -- -- 1.9 J-
CHLOROETHANE 3.0 J 1.9 J ND -- -- 2.8 J-
SA-PZ163I (32 to 42 ft bgs) (6 to -4 ft msl)
9/24/2013 9/13/2014 9/14/2015 5/12/2016 9/22/2016
1,1,1-TRICHLOROETHANE 0.43 J ND ND ND ND
1,1-DICHLOROETHANE 6.2 ND 1.2 1.6 1.2 J
1,1-DICHLOROETHENE 0.48 J ND ND ND ND
SA-MW126S (5 to 15 ft bgs) (32 to 22 ft msl)
9/25/2013 9/13/2014 9/15/2015 9/26/2016
VOCs ND NX NX ND
SA-MW126I (40 to 50 ft bgs) (-2 to -12 ft msl)
9/26/2013 9/13/2014 9/21/2015 9/26/2016
1,1-DICHLOROETHANE 0.58 J ND ND ND
SA-MW126D (74 to 84 ft bgs) (-37 to -47 ft msl)
9/25/2013 9/13/2014 9/15/2015 9/26/2016
VOCs ND ND ND ND
SA-PZ135I (41.5 to 46.5 ft bgs) (-5 to -10 ft msl)
9/24/2013 9/17/2014 9/15/2015 5/12/2016 9/29/2016
1,1,1-TRICHLOROETHANE ND 5.4 4.6 7.2 ND
1,1-DICHLOROETHANE 1.3 35 27 60 ND
1,1-DICHLOROETHENE ND 2.3 1.8 3.9 ND
CHLOROETHANE ND 5.3 5.8 12 ND
TETRACHLOROETHENE ND ND ND ND 2.0
SA-PZ161I (41 to 46 ft bgs) (-3 to -8 ft msl)
9/24/2013 9/24/2013 (Dup)
1,1-DICHLOROETHANE 9.0 9.5
1,1-DICHLOROETHENE 0.70 J 0.88 J
SA-MW127I (36 to 46 ft bgs) (2 to -8 ft msl)
9/26/2013 9/13/2014 9/22/2015 5/12/2016 9/26/2016 9/26/2016 (Dup) 12/22/2016 12/22/2016 (Dup)
1,1,1-TRICHLOROETHANE 1.7 ND ND 20 28 29 19 21
1,1-DICHLOROETHANE 23 ND 4.1 220 190 J- 180 J- 210 220
1,1-DICHLOROETHENE 1.3 ND ND 14 16 16 14 14
1,2,4-TRICHLOROBENZENE 0.67 J ND ND 1.2 0.78 J 0.85 J 1 J 1 J
1,2-DICHLOROBENZENE 0.25 J ND ND 1.5 1.2 1.2 2 J 1 J
1,3-DICHLOROBENZENE ND ND ND 0.45 J 0.87 J 0.83 J 1 J 1 J
1,4-DICHLOROBENZENE ND ND ND 6.3 4.5 4.6 6 5
BENZENE ND ND ND 0.64 J 0.68 J 0.68 J 0.6 J 0.6 J
CHLOROETHANE 4.4 ND ND 55 60 65 44 46
ISOPROPYLBENZENE ND ND ND 0.65 J ND ND ND ND
Legend
Existing Extraction Well
Injection Well
Monitoring Well/Piezometer
Fence Line Area
Offsite High Concentration Area
Offsite Low Concentration Area
Source Area
Water
1,1 - DCA Contour ug/L
1,1 - DCA Contour ug/L (Inferred)
Fence Line
Infiltration Gallery
DRAFT
N
W
E
S
200 100 0
Feet
Groundwater Analytical Detections
Southern/Fence Line Area
NWIRP Calverton
Calverton, New York
Figure 4-5
Date: 4/3/2017
Project #: 60264489
File: P:\Projects\Govt\Projects\Navy\CLEAN AECOM-EnSafe JV\Calverton\GIS\Projects\Data Summary Report March 2017\MXD\Figure 4-5 Groundwater Analytical Detections - Southern_Fence Line Area.mxd



SA-PZ140I	(44.5 to 49.5 ft bgs) (-1 to -6 ft msl)			
	9/18/2013	9/15/2014	9/15/2015	9/22/2016
1,1,1-TRICHLOROETHANE	1.2	ND	ND	ND
1,1-DICHLOROETHANE	**28**	**6.0 J-**	3.7	2.3
1,1-DICHLOROETHENE	1.9	0.46 J-	0.24 J	ND
1,2,4-TRICHLOROBENZENE	0.56 J	ND	ND	ND
NAPHTHALENE	ND	ND	ND	1.5

SA-PZ142I	(40.5 to 45.5 ft bgs) (4 to -1 ft msl)				
	9/18/2013	9/15/2014	9/15/2015	9/22/2016	9/22/2016 (Dup)
1,1,1-TRICHLOROETHANE	**41**	**13 J-**	**5.9**	ND	ND
1,1-DICHLOROETHANE	**250**	**100 J-**	**60**	**72**	**71**
1,1-DICHLOROETHENE	**23**	**8.6 J-**	4.1	4.3	4.1
1,2,4-TRICHLOROBENZENE	3.0	1.2 J	1.3 J+	1.3	1.4
1,2-DICHLOROBENZENE	0.91 J	ND	ND	ND	ND
1,3-DICHLOROBENZENE	0.53 J	ND	ND	ND	ND
1,4-DICHLOROBENZENE	2.2	ND	ND	ND	1.0
CHLOROETHANE	**21**	**8.0 J-**	**9.1**	**20**	**19**

SA-PZ143I	(41 to 46 ft bgs) (3 to -2 ft msl)			
	9/18/2013	9/17/2014	9/15/2015	9/22/2016
1,1,1-TRICHLOROETHANE	**78**	**48**	**39**	**46**
1,1-DICHLOROETHANE	**510**	**410**	**340**	**280**
1,1-DICHLOROETHENE	**43**	**34**	**28**	**26**
1,2,4-TRICHLOROBENZENE	2.0	1.2	1.6 J+	2.5
1,2-DICHLOROBENZENE	0.94 J	0.65 J	0.93 J	1.3
1,3-DICHLOROBENZENE	0.34 J	ND	ND	2.6
1,4-DICHLOROBENZENE	1.7	ND	ND	2.7
BENZENE	0.79 J	0.46 J	0.49 J	0.62 J
CHLOROETHANE	**39**	**31**	**39**	**42**

SA-PZ145I	(30 to 35 ft bgs) (8 to 3 ft msl)				
	9/25/2013	9/17/2014	9/16/2015		9/27/2016
1,1,1-TRICHLOROETHANE	0.48 J	0.99 J	ND		ND
1,1-DICHLOROETHANE	**41 J**	**32**	**24**		**15**
1,1-DICHLOROETHENE	3.6 J	3.2	2.6		1.9
1,2,4-TRICHLOROBENZENE	0.67 J	0.72 J	0.92 J+		0.53 J
1,4-DICHLOROBENZENE	0.58 J	0.76 J	ND		ND
SA-PZ145D	**(50 to 55 ft bgs) (-12 to -17 ft msl)**				
	9/25/2013	9/17/2014	9/16/2015	9/16/2015 (Dup)	9/27/2016
1,1-DICHLOROETHANE	**30**	**19**	**13**	**13**	**15**
1,1-DICHLOROETHENE	2.1	1.4	0.97 J	1.0	0.97 J
1,2,4-TRICHLOROBENZENE	0.40 J	0.43 J	0.59 J+	0.76 J+	ND

Notes:
1. ft bgs – Feet below ground surface.
2. All results are in µg/L (µg/L – micrograms per liter).
3. DCA – 1,1-Dichloroethane
4. (Dup) – Duplicate
5. **Bold** values indicate values exceeding criteria.
6. J, J+ or J- – Estimated value; + or - indicates estimates with a high or low bias.
7. ND – Not detected above report detection limit.
8. NA – Not analyzed
9. For historical analytical data preceding 2013, refer to the 2015 Data Summary Report.

Legend

- Existing Extraction Well
- Injection Well
- Monitoring Well/Piezometer
- New Extraction Well
- Fence Line Area
- Offsite High Concentration Area
- Offsite Low Concentration Area
- Peconic River Area
- Water
- 1,1 - DCA Contour ug/L
- 1,1 - DCA Contour ug/L (Inferred)
- Fence Line
- Infiltration Gallery

DRAFT

300 150 0 Feet

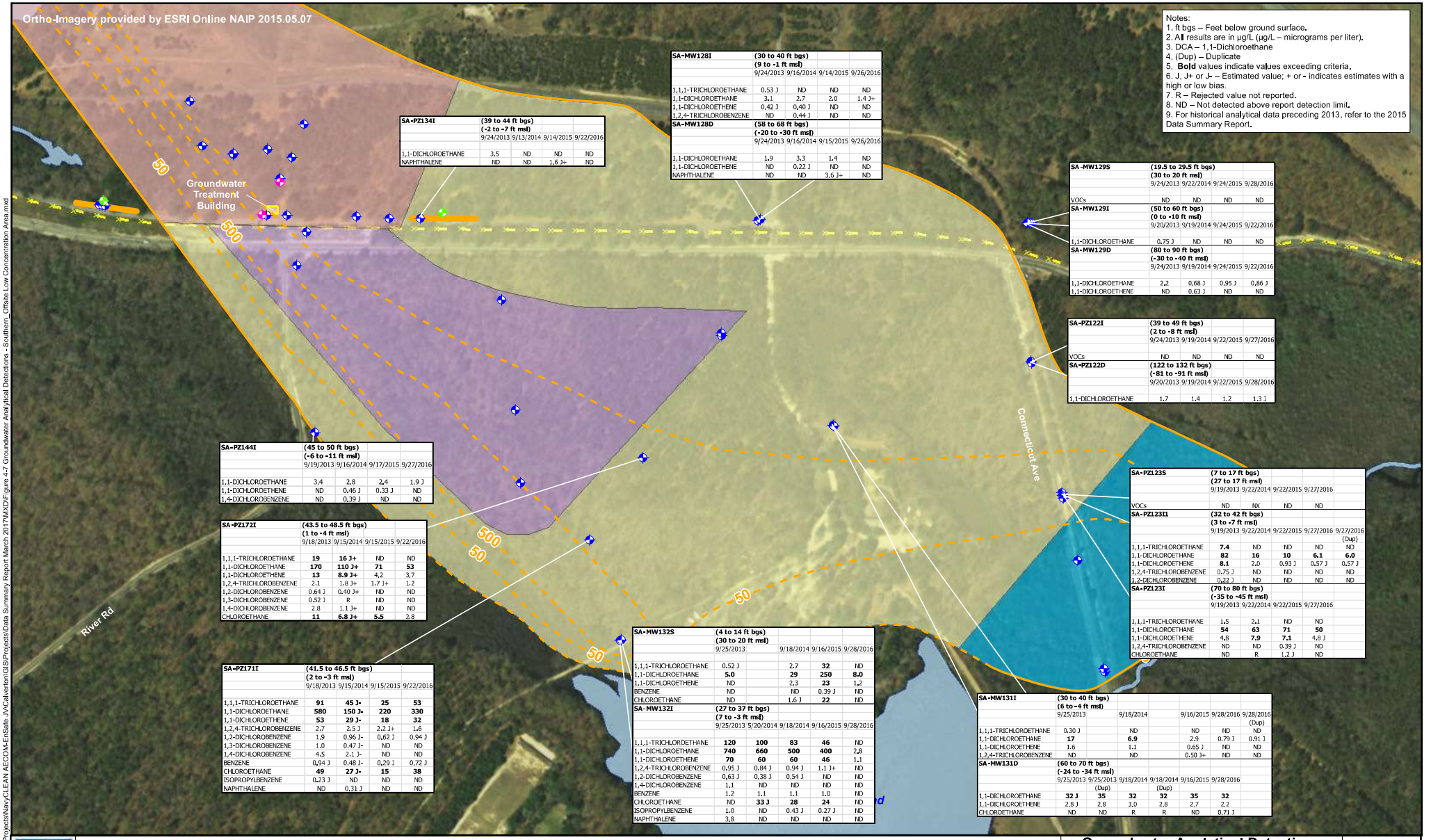
Groundwater Analytical Detections Southern/ Offsite High Concentration Area NWIRP Calverton Calverton, New York

Figure 4-6

Date: 3/29/2017

Project #: 60264489

File: P:\Projects\Govt\Projects\Navy\CLEAN AECOM-EnSafe JV\Calverton\GIS\Projects\Data Summary Report March 2017\MXD\Figure 4-6 Groundwater Analytical Detections - Southern_Offsite High Concentration Area.mxd



Notes:
1. ft bgs – Feet below ground surface.
2. All results are in µg/L (µg/L – micrograms per liter).
3. DCA – 1,1-Dichloroethane
4. (Dup) – Duplicate
5. **Bold** values indicate values exceeding criteria.
6. J, J+ or J- – Estimated value; + or - indicates estimates with a high or low bias.
7. R – Rejected value not reported.
8. ND – Not detected above report detection limit.
9. For historical analytical data preceding 2013, refer to the 2015 Data Summary Report.

SA-PZ134I	(39 to 44 ft bgs)			
	(-2 to -7 ft msl)			
	9/24/2013	9/13/2014	9/14/2015	9/22/2016
1,1-DICHLOROETHANE	3.5	ND	ND	ND
NAPHTHALENE	ND	ND	1.6 J+	ND

SA-MW128I	(30 to 40 ft bgs)			
	(9 to -1 ft msl)			
	9/24/2013	9/16/2014	9/14/2015	9/26/2016
1,1,1-TRICHLOROETHANE	0.53 J	ND	ND	ND
1,1-DICHLOROETHANE	3.1	2.7	2.0	1.4 J+
1,1-DICHLOROETHENE	0.42 J	0.40 J	ND	ND
1,2,4-TRICHLOROBENZENE	ND	0.44 J	ND	ND
SA-MW128D	**(58 to 68 ft bgs)**			
	(-20 to -30 ft msl)			
	9/24/2013	9/16/2014	9/15/2015	9/26/2016
1,1-DICHLOROETHANE	1.9	3.3	1.4	ND
1,1-DICHLOROETHENE	ND	0.22 J	ND	ND
NAPHTHALENE	ND	ND	3.6 J+	ND

SA-MW129S	(19.5 to 29.5 ft bgs)			
	(30 to 20 ft msl)			
	9/24/2013	9/22/2014	9/24/2015	9/28/2016
VOCs	ND	ND	ND	ND
SA-MW129I	**(50 to 60 ft bgs)**			
	(0 to -10 ft msl)			
	9/20/2013	9/19/2014	9/24/2015	9/22/2016
1,1-DICHLOROETHANE	0.75 J	ND	ND	ND
SA-MW129D	**(80 to 90 ft bgs)**			
	(-30 to -40 ft msl)			
	9/24/2013	9/19/2014	9/24/2015	9/22/2016
1,1-DICHLOROETHANE	2.2	0.68 J	0.95 J	0.86 J
1,1-DICHLOROETHENE	ND	0.63 J	ND	ND

SA-PZ122I	(39 to 49 ft bgs)			
	(2 to -8 ft msl)			
	9/24/2013	9/19/2014	9/22/2015	9/27/2016
VOCs	ND	ND	ND	ND
SA-PZ122D	**(122 to 132 ft bgs)**			
	(-81 to -91 ft msl)			
	9/20/2013	9/19/2014	9/22/2015	9/28/2016
1,1-DICHLOROETHANE	1.7	1.4	1.2	1.3 J

SA-PZ144I	(45 to 50 ft bgs)			
	(-6 to -11 ft msl)			
	9/19/2013	9/16/2014	9/17/2015	9/27/2016
1,1-DICHLOROETHANE	3.4	2.8	2.4	1.9 J
1,1-DICHLOROETHENE	ND	0.46 J	0.33 J	ND
1,4-DICHLOROBENZENE	ND	0.39 J	ND	ND

SA-PZ172I	(43.5 to 48.5 ft bgs)			
	(1 to -4 ft msl)			
	9/18/2013	9/15/2014	9/15/2015	9/22/2016
1,1,1-TRICHLOROETHANE	**19**	**16 J+**	ND	ND
1,1-DICHLOROETHANE	**170**	**110 J+**	**71**	**53**
1,1-DICHLOROETHENE	**13**	**8.9 J+**	4.2	3.7
1,2,4-TRICHLOROBENZENE	2.1	1.8 J+	1.7 J+	1.2
1,2-DICHLOROBENZENE	0.64 J	0.40 J+	ND	ND
1,3-DICHLOROBENZENE	0.52 J	R	ND	ND
1,4-DICHLOROBENZENE	2.8	1.1 J+	ND	ND
CHLOROETHANE	**11**	**6.8 J+**	**5.5**	2.8

SA-PZ171I	(41.5 to 46.5 ft bgs)			
	(2 to -3 ft msl)			
	9/18/2013	9/15/2014	9/15/2015	9/22/2016
1,1,1-TRICHLOROETHANE	**91**	**45 J-**	**25**	**53**
1,1-DICHLOROETHANE	**580**	**150 J-**	**220**	**330**
1,1-DICHLOROETHENE	**53**	**29 J-**	**18**	**32**
1,2,4-TRICHLOROBENZENE	2.7	2.5 J	2.2 J+	1.6
1,2-DICHLOROBENZENE	1.9	0.96 J-	0.62 J	0.94 J
1,3-DICHLOROBENZENE	1.0	0.47 J-	ND	ND
1,4-DICHLOROBENZENE	4.5	2.1 J-	ND	ND
BENZENE	0.94 J	0.48 J-	0.29 J	0.72 J
CHLOROETHANE	**49**	**27 J-**	**15**	**38**
ISOPROPYLBENZENE	0.23 J	ND	ND	ND
NAPHTHALENE	ND	0.31 J	ND	ND

SA-MW132S	(4 to 14 ft bgs)				
	(30 to 20 ft msl)				
	9/25/2013		9/18/2014	9/16/2015	9/28/2016
1,1,1-TRICHLOROETHANE	0.52 J		2.7	**32**	ND
1,1-DICHLOROETHANE	**5.0**		**29**	**250**	**8.0**
1,1-DICHLOROETHENE	ND		2.3	**23**	1.2
BENZENE	ND		ND	0.39 J	ND
CHLOROETHANE	ND		1.6 J	**22**	ND
SA-MW132I	**(27 to 37 ft bgs)**				
	(7 to -3 ft msl)				
	9/25/2013	5/20/2014	9/18/2014	9/16/2015	9/28/2016
1,1,1-TRICHLOROETHANE	**120**	**100**	**83**	**46**	ND
1,1-DICHLOROETHANE	**740**	**660**	**500**	**400**	2.8
1,1-DICHLOROETHENE	**70**	**60**	**60**	**46**	1.1
1,2,4-TRICHLOROBENZENE	0.95 J	0.84 J	0.94 J	1.1 J+	ND
1,2-DICHLOROBENZENE	0.63 J	0.38 J	0.54 J	ND	ND
1,4-DICHLOROBENZENE	1.1	ND	ND	ND	ND
BENZENE	1.2	1.1	1.1	1.0	ND
CHLOROETHANE	ND	**33 J**	**28**	**24**	ND
ISOPROPYLBENZENE	1.0	ND	0.43 J	0.27 J	ND
NAPHTHALENE	3.8	ND	ND	ND	ND

SA-PZ123S	(7 to 17 ft bgs)				
	(27 to 17 ft msl)				
	9/19/2013	9/22/2014	9/22/2015	9/27/2016	
VOCs	ND	NX	ND	ND	
SA-PZ123II	**(32 to 42 ft bgs)**				
	(3 to -7 ft msl)				
	9/19/2013	9/22/2014	9/22/2015	9/27/2016	9/27/2016 (Dup)
1,1,1-TRICHLOROETHANE	**7.4**	ND	ND	ND	ND
1,1-DICHLOROETHANE	**82**	**16**	**10**	**6.1**	**6.0**
1,1-DICHLOROETHENE	**8.1**	2.0	0.93 J	0.57 J	0.57 J
1,2,4-TRICHLOROBENZENE	0.75 J	ND	ND	ND	ND
1,2-DICHLOROBENZENE	0.22 J	ND	ND	ND	ND
SA-PZ123I	**(70 to 80 ft bgs)**				
	(-35 to -45 ft msl)				
	9/19/2013	9/22/2014	9/22/2015	9/27/2016	
1,1,1-TRICHLOROETHANE	1.5	2.1	ND	ND	
1,1-DICHLOROETHANE	**54**	**63**	**71**	**50**	
1,1-DICHLOROETHENE	4.8	**7.9**	**7.1**	4.8 J	
1,2,4-TRICHLOROBENZENE	ND	ND	0.39 J	ND	
CHLOROETHANE	ND	R	1.2 J	ND	

SA-MW131I	(30 to 40 ft bgs)					
	(6 to -4 ft msl)					
	9/25/2013		9/18/2014		9/16/2015	9/28/2016	9/28/2016 (Dup)
1,1,1-TRICHLOROETHANE	0.30 J		ND		ND	ND	ND
1,1-DICHLOROETHANE	**17**		**6.9**		2.9	0.79 J	0.91 J
1,1-DICHLOROETHENE	1.6		1.1		0.65 J	ND	ND
1,2,4-TRICHLOROBENZENE	ND		ND		0.50 J+	ND	ND
SA-MW131D	**(60 to 70 ft bgs)**						
	(-24 to -34 ft msl)						
	9/25/2013	9/25/2013 (Dup)	9/18/2014	9/18/2014 (Dup)	9/16/2015	9/28/2016	
1,1-DICHLOROETHANE	**32 J**	**35**	**32**	**32**	**35**	**32**	
1,1-DICHLOROETHENE	2.8 J	2.8	3.0	2.8	2.7	2.2	
CHLOROETHANE	ND	ND	R	R	ND	0.71 J	

Legend

Existing Extraction Well
Injection Well
Monitoring Well/Piezometer
New Extraction Well
Fence Line Area
Offsite High Concentration Area
Offsite Low Concentration Area
Peconic River Area
Water
1,1 - DCA Contour ug/L
1,1 - DCA Contour ug/L (Inferred)
Fence Line
Infiltration Gallery

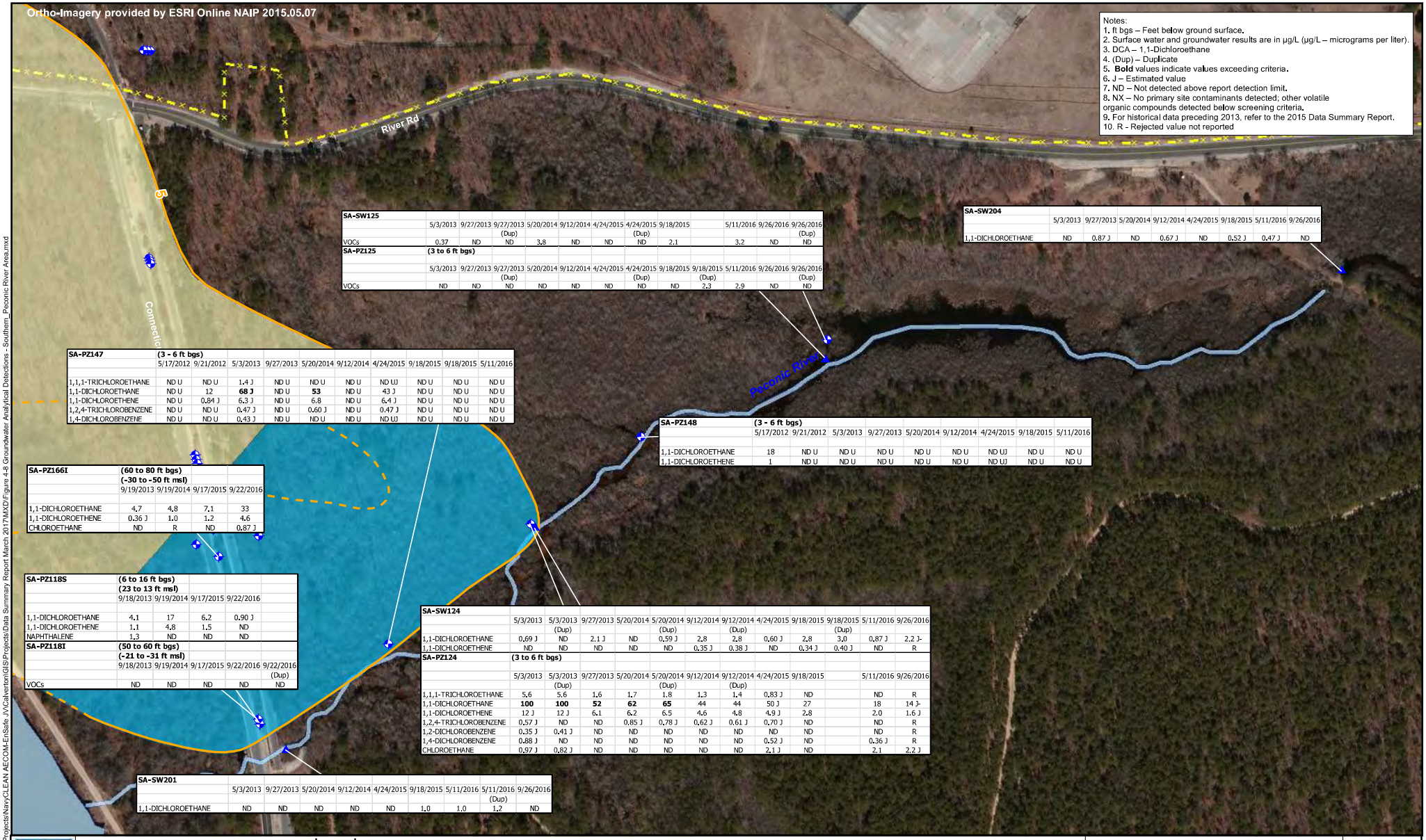
DRAFT

300 150 0 Feet

Groundwater Analytical Detections Southern/ Offsite Low Concentration Area NWIRP Calverton Calverton, New York

Figure 4-7
Date: 4/3/2017
Project #: 60264489

File: P:\Projects\Govt\Projects\Navy\CLEAN AECOM-EnSafe JV\Calverton\GIS\Projects\Data Summary Report March 2017\MXD\Figure 4-7 Groundwater Analytical Detections - Southern_Offsite Low Concentration Area.mxd



Notes:
1. ft bgs – Feet below ground surface.
2. Surface water and groundwater results are in µg/L (µg/L – micrograms per liter).
3. DCA – 1,1-Dichloroethane
4. (Dup) – Duplicate
5. **Bold** values indicate values exceeding criteria.
6. J – Estimated value
7. ND – Not detected above report detection limit.
8. NX – No primary site contaminants detected; other volatile organic compounds detected below screening criteria.
9. For historical data preceding 2013, refer to the 2015 Data Summary Report.
10. R - Rejected value not reported

SA-SW125											
	5/3/2013	9/27/2013	9/27/2013 (Dup)	5/20/2014	9/12/2014	4/24/2015	4/24/2015 (Dup)	9/18/2015	5/11/2016	9/26/2016	9/26/2016 (Dup)
VOCs	0.37	ND	ND	3.8	ND	ND	ND	2.1	3.2	ND	ND

SA-PZ125	(3 to 6 ft bgs)										
	5/3/2013	9/27/2013	9/27/2013 (Dup)	5/20/2014	9/12/2014	4/24/2015	4/24/2015 (Dup)	9/18/2015	9/18/2015 (Dup)	5/11/2016	9/26/2016	9/26/2016 (Dup)
VOCs	ND	ND	ND	ND	ND	ND	ND	ND	2.3	2.9	ND	ND

SA-SW204									
	5/3/2013	9/27/2013	5/20/2014	9/12/2014	4/24/2015	9/18/2015	5/11/2016	9/26/2016	
1,1-DICHLOROETHANE	ND	0.87 J	ND	0.67 J	ND	0.52 J	0.47 J	ND	

SA-PZ147	(3 - 6 ft bgs)									
	5/17/2012	9/21/2012	5/3/2013	9/27/2013	5/20/2014	9/12/2014	4/24/2015	9/18/2015	9/18/2015	5/11/2016
1,1,1-TRICHLOROETHANE	ND U	ND U	1.4 J	ND U	ND U	ND U	ND UJ	ND U	ND U	ND U
1,1-DICHLOROETHANE	ND U	12	**68 J**	ND U	**53**	ND U	43 J	ND U	ND U	ND U
1,1-DICHLOROETHENE	ND U	0.84 J	6.3 J	ND U	6.8	ND U	6.4 J	ND U	ND U	ND U
1,2,4-TRICHLOROBENZENE	ND U	ND U	0.47 J	ND U	0.60 J	ND U	0.47 J	ND U	ND U	ND U
1,4-DICHLOROBENZENE	ND U	ND U	0.43 J	ND U	ND U	ND U	ND UJ	ND U	ND U	ND U

SA-PZ148	(3 - 6 ft bgs)								
	5/17/2012	9/21/2012	5/3/2013	9/27/2013	5/20/2014	9/12/2014	4/24/2015	9/18/2015	5/11/2016
1,1-DICHLOROETHANE	18	ND U	ND U	ND U	ND U	ND U	ND UJ	ND U	ND U
1,1-DICHLOROETHENE	1	ND U	ND U	ND U	ND U	ND U	ND UJ	ND U	ND U

SA-PZ166I	(60 to 80 ft bgs) (-30 to -50 ft msl)			
	9/19/2013	9/19/2014	9/17/2015	9/22/2016
1,1-DICHLOROETHANE	4.7	4.8	7.1	33
1,1-DICHLOROETHENE	0.36 J	1.0	1.2	4.6
CHLOROETHANE	ND	R	ND	0.87 J

SA-PZ118S	(6 to 16 ft bgs) (23 to 13 ft msl)				
	9/18/2013	9/19/2014	9/17/2015	9/22/2016	
1,1-DICHLOROETHANE	4.1	17	6.2	0.90 J	
1,1-DICHLOROETHENE	1.1	4.8	1.5	ND	
NAPHTHALENE	1.3	ND	ND	ND	
SA-PZ118I	**(50 to 60 ft bgs) (-21 to -31 ft msl)**				
	9/18/2013	9/19/2014	9/17/2015	9/22/2016	9/22/2016 (Dup)
VOCs	ND	ND	ND	ND	ND

SA-SW124											
	5/3/2013	5/3/2013 (Dup)	9/27/2013	5/20/2014	5/20/2014 (Dup)	9/12/2014	9/12/2014 (Dup)	4/24/2015	9/18/2015	9/18/2015 (Dup)	5/11/2016	9/26/2016
1,1-DICHLOROETHANE	0.69 J	ND	2.1 J	ND	0.59 J	2.8	2.8	0.60 J	2.8	3.0	0.87 J	2.2 J-
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	0.35 J	0.38 J	ND	0.34 J	0.40 J	ND	R

SA-PZ124	(3 to 6 ft bgs)											
	5/3/2013	5/3/2013 (Dup)	9/27/2013	5/20/2014	5/20/2014 (Dup)	9/12/2014	9/12/2014 (Dup)	4/24/2015	9/18/2015		5/11/2016	9/26/2016
1,1,1-TRICHLOROETHANE	5.6	5.6	1.6	1.7	1.8	1.3	1.4	0.83 J	ND		ND	R
1,1-DICHLOROETHANE	**100**	**100**	**52**	**62**	**65**	44	44	50 J	27		18	14 J-
1,1-DICHLOROETHENE	12 J	12 J	6.1	6.2	6.5	4.6	4.8	4.9 J	2.8		2.0	1.6 J
1,2,4-TRICHLOROBENZENE	0.57 J	ND	ND	0.85 J	0.78 J	0.62 J	0.61 J	0.70 J	ND		ND	R
1,2-DICHLOROBENZENE	0.35 J	0.41 J	ND	ND	ND	ND	ND	ND	ND		ND	R
1,4-DICHLOROBENZENE	0.88 J	ND	ND	ND	ND	ND	ND	0.52 J	ND		0.36 J	R
CHLOROETHANE	0.97 J	0.82 J	ND	ND	ND	ND	ND	2.1 J	ND		2.1	2.2 J

SA-SW201									
	5/3/2013	9/27/2013	5/20/2014	9/12/2014	4/24/2015	9/18/2015	5/11/2016	5/11/2016 (Dup)	9/26/2016
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	1.0	1.0	1.2	ND

Legend

- Monitoring Well/Piezometer
- Surface Water Sampling Location
- 1,1 - DCA Contour ug/L
- 1,1 - DCA Contour ug/L (Inferred)
- Fence Line
- Offsite Low Concentration Area
- Peconic River Area
- Water

DRAFT

200 100 0 Feet

Analytical Detections Southern/Peconic River Area NWIRP Calverton Calverton, New York

Figure 4-8
Date: 4/3/2017
Project #: 60264489

File: P:\Projects\Govt\Projects\Navy\CLEAN AECOM-EnSafe JV\Calverton\GIS\Projects\Data Summary Report March 2017\MXD\Figure 4-8 Groundwater Analytical Detections - Southern_Peconic River Area.mxd