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HAND DELIVERED

January 2, 2009

Mr. Herb Meade
Maryland Department of the Environment
Oil Control Program
1800 Washington Boulevard
Baltimore, MD 21230

Re: Corrective Action Plan
Inactive Exxon Facility # 28077
14258 Jarrettsville Pike
Phoenix, Maryland

Dear Mr Meade:

Enclosed please find the Corrective Action Plan for the above referenced site as requested by the Maryland Department of the Environment in a letter dated October 6, 2008. Four hard copies and one electronic copy of the report are included in this submittal.

Please feel free to contact us at (410) 850-0404 if you have any questions or require additional information.

Sincerely yours,
Kleinfelder East, Inc.

Leslie Schultheis, P.E.
Project Manager

Mark J. Schaaf, C.P.G
Project Director

cc: Ms. Ellen Jackson – MDE Oil Control Program
Mr. James F. Medlin – Exxon Mobil Corporation
Ms. Marie C McGowan – Exxon Mobil Corporation
Mr. G. Martin – Roux Associates, Inc.
Mary V. Koch, Esquire - Law Offices of Peter Angelos
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CORRECTIVE ACTION PLAN

Inactive Exxon Service Station # 28077
14258 Jarrettsville Pike
Phoenix, Maryland

MDE Case No. 2006-0303-BA2

January 2, 2009

Prepared By:

Kleinfelder
1340 Charwood Road, Suite I
Hanover, MD 21076

Prepared For:

ExxonMobil Environmental
Services Company
1413 HWY 17 South #183
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QUALITY ASSURANCE/QUALITY CONTROL

The following personnel have reviewed this report for accuracy, content and quality of presentation:

Matthew R. Newman — 12/31/08

Matthew Newman
Engineer — Date

12/31/08

Leslie D. Schultheis, P.E.
Project Engineer — Date

for. — Dec 31, 2008

Jeffrey R. Hale, P.G.
Principal Hydrogeologist — Date

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1.0 Introduction

At the request of ExxonMobil Environmental Services Company (EMES), Kleinfelder prepared this Corrective Action Plan (CAP) on behalf of Exxon Mobil Corporation (ExxonMobil) for the inactive Exxon Facility # 28077 located at 14258 Jarrettsville Pike in Phoenix, Baltimore County, Maryland (Site). This CAP has been prepared in accordance with Code of Maryland Regulations (COMAR) 26.10.09 and was requested by the Maryland Department of the Environment (MDE) in a letter dated October 6, 2008 (**Attachment 1**).

Corrective action activities have been ongoing since February 17, 2006 under the direction of the MDE in response to the discovery of unleaded gasoline in existing groundwater monitoring wells. Remediation activities at the Site and surrounding properties are being conducted according to the MDE-approved *Interim Remedial Measures (IRM) Plan* dated March 27, 2006 and the *Updated Interim Remedial Measures Plan* dated September 25, 2006. Upgrades and modifications to the remedial systems and remedial activities, completed since the September 25, 2006 *Updated IRM Plan,* have been approved by the MDE and are summarized in the Quarterly Groundwater Monitoring and Remedial Status Reports.

This CAP is intended to formalize the remedial activities that are already in place at the Site and in the surrounding area. In accordance with COMAR, this CAP contains a site assessment summary, history of previous emergency response and remedial activities, and a corrective action plan for the facility. Details of the current remedial measures are outlined in subsequent sections of this CAP. This CAP also describes the procedures that EMES will employ to evaluate and obtain MDE approval for any supplemental remedial measures that may be proposed by EMES or required by the MDE.

2.0 Site Overview

The following sections present a summary of the Site location and features based on field reconnaissance, review of available literature, and data collected during investigation activities.

2.1 Site Area and Description

Inactive Exxon Facility # 28077 is located at 14258 Jarrettsville Pike, on the southwest corner of the intersection of Jarrettsville Pike (MD Route 146) and Sweet Air Road / Paper Mill Road (MD Route 145) in Phoenix, Baltimore County, Maryland (**Figure 1**). Three additional properties are owned by ExxonMobil in the vicinity of the Site and are used to house remediation equipment. These properties are located near the intersection of Jarrettsville Pike (MD Route 146) and Sweet Air Road/ Paper Mill Road (MD Route 145), including two former commercial properties located at 3410 and 3418 Sweet Air Road, and a former commercial property immediately west of the Site at 3313 Papermill Road. Remedial equipment is also located at a private residential property at 3508 Hampshire Glen Court.

Prior to remedial activities, the facility was a retail gasoline service station consisting of two 8,000-gallon gasoline underground storage tanks (USTs), one 10,000-gallon diesel UST, one 12,000-gallon gasoline UST and associated piping, a canopy covering three dispenser islands, and a service station building with three service bays and an office. The USTs were installed in 1985 and were constructed of double-walled, fiberglass-coated steel. One 1,000-gallon fiberglass used-oil UST and one 1,000-gallon fiberglass heating-oil UST were removed from the Site in July 1992 and May 1997 respectively. The remaining USTs and associated piping were removed from the facility in late March to early April 2006. The results of these activities were reported to the MDE in the *Tank Excavation Assessment Report* dated April 30, 2006 and are discussed further in Section 3.2.

Local businesses are concentrated around the intersection of Jarrettsville Pike (MD Route 146) and Sweet Air Road / Paper Mill Road (MD Route 145). Beyond this “business district” the land use is primarily single-family residential properties interspersed with some vacant, undeveloped lots and wooded areas. Area utilities include overhead and underground electric service and underground telephone service. Potable water in the vicinity of the Site is supplied by private supply wells. Sewage disposal in the area is handled by private septic systems. Basements and slab-on-grade construction are typical for properties in the vicinity of the Site. Area land use and utilities are described in more detail in the *Preliminary Hydrogeologic and Contaminant Assessment Report* (PHACAR) dated July 2006.

2.2 Site Assessment Summary

Site investigation methods, physical setting, hydrogeologic framework, and hydrocarbon distribution for the Site and vicinity are summarized herein, and described in detail in several documents previously provided to the MDE including those listed below.

- *Preliminary Hydrogeologic and Contaminant Assessment Report (PHACAR) (July 2006)*
- *Request for a Permit to Appropriate and Use Waters of the State (October 2006)*
- *Lineament Trace Analysis Report (April 18, 2008)*
- *Expanded Monitoring Well Network Installation – Phases I/II (April 18, 2008)*
- *Quarterly Groundwater Monitoring and Remedial Status Reports (submitted quarterly)*
- *Letter Reports: Discrete Interval Sampling via Hydrasleeve® (August 15, 2008 and November 14, 2008)*
- *Domestic Well and Point of Entry Treatment (POET) Sampling Reports (submitted quarterly)*
- *Soil Vapor Sampling and Analysis Reports (submitted quarterly)*

Site characterization activities have been discussed in detail in the aforementioned documents and include, but are not limited to, the following:

- A review of available geologic mapping and literature for the region
- Advancement of boreholes for monitoring well installation
- Acquisition of bedrock core samples
- Down hole geophysical logging of boreholes
- Surface geophysical data collection including:
    - Completion of an area microgravity survey and microgravity survey profiles
    - Completion of seismic survey profiles
    - Completion of electrical resistivity imaging profiles
- Lineament trace analysis
- Implementation and analysis of slug tests
- Completion of hydraulic profiling with blank Flexible Liner Underground Technologies (FLUTe™) liners
- Installation of custom FLUTe™ liners with discrete sampling ports

- Implementation and analysis of constant-rate aquifer pumping tests to the northeast and southwest of the Site
- Collection and analysis of discrete interval HydraSleeve® sampling
- Collection and analysis of groundwater samples from monitoring wells
- Collection and analysis of surface water (stream and pond) samples
- Implementation and analysis of groundwater potentiometric surface and liquid phase hydrocarbon (LPH) thickness level gauging events
- Collection and analysis of private supply well samples within an approximate ½-mile radius of the Site
- Collection of soil vapor samples from soil vapor sampling points.

A summary of the overall findings from these activities is presented in the subsections below.

2.2.1 Geology/Hydrogeology

The findings of the PHACAR and subsequent assessment activities as they relate to area geology and hydrogeology are summarized below.

The Site is underlain by metamorphic rocks (dominantly schist) with a foliation that strikes to the northeast-southwest and dips to the northwest. The top of the bedrock surface and structural orientation of the foliation represent the subsurface framework that in part controls the area topography, surface water drainage, and direction of groundwater flow. This bedrock framework is susceptible to weathering which weakens the bedrock structure along the direction of foliation. A lithologic change has been identified trending in the direction of strike, with schist to the south and an epidote-amphibolite gneiss to the north. Specifically, a generally linear, northeast-southwest trending, weathering-enhanced fracture zone has been identified to trend through the Site along the aforementioned lithologic contact and parallel to the direction of metamorphic foliation. This feature is termed the “strike line.” Hydrocarbon migration has been observed along, and generally restricted to, the linear extent of the extensively monitored “strike line.”

Conformably overlying bedrock is a layer of saprolite (soil-like material derived by the weathering of bedrock with relic bedrock structure remaining). Soils overlay the saprolite and are generally composed of silty to sandy clays and clayey to silty sands. The soils encountered during the investigation are generally colluvium or residual soils resulting from the in-situ weathering of the local metamorphic bedrock. There are localized areas of alluvium primarily within the stream channels in the vicinity of the Site. The colluvial, alluvial, and residual soils are collectively referred to in this report as "overburden." The thickness of the overburden across the area of investigation ranges from 5 feet to 65 feet.

Groundwater exists within the secondary bedrock porosity along joints, foliation planes, and fractures and within the intergranular porosity of overlying saprolite and overburden. Beneath and in the immediate vicinity of the Site, the water table is within the bedrock. To the northeast and southwest of the Site (lower elevation), the water table is within the overburden and saprolite. The highest groundwater potentiometric surface elevations are measured north of the Site. The groundwater potentiometric surface decreases in elevation away from the Site to the northeast and southwest, converging at lower elevations corresponding to the drainage valleys. The aquifer is characterized by anisotropy corresponding to the structural orientation of the bedrock foliation. The distribution of hydraulic conductivity across the area of investigation forms an elongate northeast-southwest trending pattern with a core of greater hydraulic conductivity decreasing to lesser hydraulic conductivity at the periphery. The September 2008 potentiometric surface map is included as **Figure 2**. Monthly potentiometric surface maps have been submitted in quarterly reports.

2.2.2 Nature and Extent of Constituents of Concern

The findings of the PHACAR and subsequent assessment and monitoring activities as they relate to the historic distribution of gasoline and gasoline constituents within the subsurface in the vicinity of the Site are summarized below.

Liquid phase hydrocarbon migration occurred along a linear trend (i.e. the strike line) to the southwest and northeast away from the Site. The strike line trend is slightly off-set and follows a slightly different orientation to the southwest and northeast, which is attributable to the structural trend of the bedrock and the nature of the geologic contact between the schist and epidote-amphibolite gneiss.

The farthest extent of measurable LPH to the southwest was gauged at MW-72 (approximately 350 feet from the Site). The farthest extent of measurable LPH to the northeast was gauged at MW-77A (approximately 1,200 feet from the Site). LPH migration beyond these two locations has not been observed. Additionally, as a result of remediation activities, LPH has not been observed in any monitoring wells since August 2006, with the exception of an observation of 0.01 foot in onsite monitoring well MW-27 in May 2008.

Dissolved phase hydrocarbon migration also occurred to the southwest and northeast in an elongate pattern that is generally consistent with the strike line and the direction of decreasing potentiometric surface elevations. Using MTBE as an indicator, the extent of the dissolved-phase plume has been delineated to less than the MDE action level of 20 micrograms per liter (µg/L) in the northeast and southwest for “A,” “B,” and “C” series monitoring wells, based on August 2008 groundwater monitoring analytical results presented in **Figures 3** and **4,** respectively. This delineation is also supported by two rounds of discrete (Hydrasleeve®) groundwater sampling results associated with “C” series wells that in part comprise the expanded monitoring well network. The expanded monitoring well network is documented in the letter report: *Expanded Monitoring Well Network Installation – Phases I/*II, dated April 18, 2008. The discrete groundwater sampling events were conducted on July 20 and 23, 2008 and September 11 and 12, 2008, and reported to MDE on August 15, 2008 and November 14, 2008, respectively

Of the 282 private supply wells that have been sampled as part of this study, 12 have had detections of gasoline-related compounds above MDE action levels. A total of 14 properties have had point of entry treatment (POET) systems connected to their supply wells. At present, there are a total of three properties that have detections of gasoline compounds above MDE action levels (each of which has a POET system in place). Area private supply wells and POET systems continue to be sampled according to an MDE-approved schedule.

Soil vapor monitoring has been conducted at locations determined by the MDE, as detailed in the *Scope of Work for Soil Vapor Sampling and Analysis* that was submitted to the MDE on March 30, 2006. Soil vapor sampling was initially conducted on a monthly basis. Based upon the evaluation of data presented in the *Soil Vapor Sampling and Analysis Reports*, the MDE approved a proposal dated April 29, 2008 to reduce the soil vapor sampling frequency from monthly to quarterly. The soil vapor sample results do not indicate that the vapor intrusion pathway is a concern for properties in the area being monitored.

Periodic sampling of surface water features demonstrate that these water bodies have not been adversely affected by the release at the Site.

3.0 Remediation Activities Completed

Remedial activities began as a response to the detection of LPH in onsite monitoring wells on February 17, 2006. Remediation activities at the site and surrounding properties have been conducted according to the MDE-approved *Interim Remedial Measures (IRM) Plan* dated March 27, 2006 and the *Updated Interim Remedial Measures Plan* dated September 25, 2006. Upgrades and modifications to the remedial systems and remedial activities, completed since the September 25, 2006 *Updated IRM Plan,* have been approved by the MDE and are summarized in the Quarterly Groundwater Monitoring and Remedial Status Reports. A summary of remediation activities completed to date is provided in the following sections.

3.1 Initial Response

Initial response activities consisted of three general facets that were implemented in parallel and concurrent fashion: 1) Site characterization activities (described above); 2) remediation of impacted media identified through site characterization activities; and 3) protective measures (private supply well sampling and bottled water delivery). Remediation activities and protective measures are described in the following paragraphs.

The initial remedial response began on February 17, 2006 following detection of LPH in two existing onsite monitoring wells. Remediation began using vacuum trucks to extract LPH and groundwater from these two existing onsite wells. On February 18, 2006, installation of additional onsite monitoring wells began. As additional onsite monitoring wells were installed and found to contain LPH, remediation activities were expanded. Additional mobile remediation equipment was deployed including up to three vacuum trucks and up to two internal combustion engine (ICE) units. Beginning on February 25, 2006, pneumatic pumps were brought online for recovery of total fluids into fractioning tanks (frac tanks) located on the Site. The contents of the frac tanks were transported offsite to a treatment and disposal facility daily.

Remediation activities were expanded to the southwest and northeast of the Site. Remediation activities were initiated in monitoring wells on surrounding properties in the southwest and northeast quadrants on March 2, 2006, and March 6, 2006, respectively. Frac tanks were installed on 3410 Sweet Air Road for temporary storage of total fluids recovered from monitoring wells in the northeast quadrant.

As a protective measure, and concurrent with ongoing investigation and remediation activities, sampling of area private supply wells began on February 20, 2006, and delivery of bottled water to residences and businesses began on February 23, 2006. The private supply well sampling area (and bottled water delivery area) expanded and evolved as the investigation progressed under the direction of the MDE. Throughout this initial stage of remediation, status updates were provided to the MDE which listed the different types of remediation activities that were being conducted on the individual monitoring wells, in addition to summarizing investigation activities and area private supply well sampling.

On March 6, 2006, a Flame Oxidizer 750 soil vapor extraction (SVE) system was deployed to the Site to recover vapor phase hydrocarbons from soils above the water table. The unit extracted vapors from onsite and offsite monitoring wells and treated the vapors through a flame oxidizing unit. Additional SVE units were also mobilized to the Site and installed for increased recovery of hydrocarbons from the vadose zone. By March 26, 2006, three additional SVE units were online on the Site and installation of additional SVE units was being planned for use in the northeast quadrant. On March 27, 2006, the *IRM Plan* was submitted to the MDE which described activities completed to date in more detail.

3.2 UST Removal

Four USTs, a canopy and dispenser islands were located on the east side of the Site. The USTs included two 8,000-gallon gasoline USTs, one 12,000-gallon gasoline UST, and one 10,000-gallon diesel UST. A&A Environmental/Permafix cleaned and vented the USTs and product lines on February 19, 2006. Activities associated with UST system removal were performed between March 4 and April 10, 2006 by Petroleum Services and Installation (PSI), including removal of the USTs, dispensers, product piping, vapor recovery piping, vent piping and surrounding soils under the direction of the MDE. Approximately 1,150 tons of soil was removed and transported offsite for disposal at the Soil Safe Inc. Brandywine, Maryland facility. Soil samples were collected during UST system removal and soil excavation activities as detailed in the *Tank Excavation Assessment Report* dated April 28, 2006. Prior to backfilling the UST excavation, six 12-inch diameter galvanized steel casings were installed at different locations to facilitate installation of monitoring wells within the former UST field at a later date. Two horizontal well screens were also installed in the former UST field at depths of approximately 14 feet and 17 feet below ground surface (bgs), and connected to solid PVC risers brought to ground surface to facilitate potential future remediation activities. The locations of the former UST field and the horizontal screens are shown on **Figure 5**.

3.3 Interim Remedial Activities

From March 27, 2006 through September 25, 2006, remediation activities continued on the Site and surrounding properties, generally as outlined in the *IRM Plan*, with additional expansion and equipment modifications to allow for optimization of recovery and transitions to equipment suited for longer-term remediation. The continuing remediation activities and modifications were described in site status updates submitted to the MDE, and the *Updated Interim Remedial Measures Plan* dated September 25, 2006. Starting with the First Quarter 2007, remediation activities and system modifications have been described in the *Groundwater Monitoring and Remedial Status Reports*, which are submitted to the MDE on a quarterly basis.

In addition to the remedial activities summarized in sub-sections 3.1 and 3.2 above, interim remediation activities expanded over time to include the following:

- Recovery of LPH, groundwater and soil vapor (or a combination thereof) from up to 88 wells on 15 properties.
- Operation of up to 15 different SVE / Dual Phase Extraction (DPE) units at various times, on up to six properties. To optimize recovery, SVE/DPE units were relocated and upgraded as different units and access became available.
- Vapors recovered from SVE and DPE systems were initially treated by flame and thermal oxidation, which later transitioned to catalytic oxidation and vapor phase granulated activated carbon (VGAC), as influent concentrations decreased. By May 31, 2007, the transition solely to VGAC units for treatment of recovered vapor was complete as oxidizer units were taken offline.
- Temporary groundwater treatment equipment was brought online for onsite treatment of recovered groundwater and discharge to surface water beginning May 10, 2006. Additional temporary groundwater treatment units were brought online in the southwest and northeast, and by September 25, 2006 all recovered water was treated with equipment located onsite and on 3418 Sweet Air Road. Groundwater recovered in the southwest quadrant was treated onsite and effluent was sampled to confirm compliance with the NPDES permit prior to discharging to the southwest surface water outfall shown on **Figure 5**. Groundwater recovered in the northeast quadrant was treated on 3418 Sweet Air Road and effluent was sampled to confirm compliance with the NPDES permit prior to discharging to the northeast surface water outfall shown on **Figure 5**.
- By February 5, 2007, the groundwater treatment system was being operated in its current overall configuration after installation of 10 two-inch HDPE pipes encased within a 12-inch HDPE conduit was completed via horizontal directional drilling (HDD) under Routes 145 and 146 to connect equipment on 3418 Sweet Air Road to the Site. This allowed for centralized groundwater treatment including a combination of air stripping, a fluidized bed bioreactor, and liquid phase granular activated carbon. This also allowed for the removal of various temporary treatment equipment components. The piping within the HDD conduit is used to convey recovered groundwater, treated effluent, air to power all pneumatic pumps, and fiber optic cables for communication between system components in the southwest and northeast quadrants.

The current remediation system is described in the *Third Quarter Groundwater Monitoring and Remedial Status Report*, and summarized below. The layout of the system as depicted on **Figure 5**, and the remediation wells as listed in **Table 1** of this CAP are current through December 23, 2008.

- Operation of six independent soil vapor extraction units, three connected to wells located on properties in the southwest quadrant (14258 Jarrettsville Pike, 3313 Papermill Road, 14217 Robcaste Road, 14219 Robcaste Road, and 14223 Robcaste Road), and three connected to wells located on properties in the northeast quadrant (14301 Jarrettsville Pike, 14307 Jarrettsville Pike, 3501 Hampshire Glen Court, 3503 Hampshire Glen Court, 3506 Hampshire Glen Court, 3508 Hampshire Glen Court, 3600 Hampshire Glen Court, 3605A Southside Avenue, and 3605B Southside Avenue). Recovered vapors are treated with VGAC on properties owned by ExxonMobil prior to discharge in accordance with MDE permits. The SVE systems are used for recovery of vapor phase gasoline constituents.
- Operation of electric or pneumatic submersible pumps in monitoring wells on 15 properties for groundwater recovery along the strike line in the northeast and southwest quadrants. The pumps are operated to maintain hydraulic capture and recover dissolved phase petroleum hydrocarbon constituents.
- Recovered groundwater is conveyed to the Site and treated through an integrated groundwater treatment system which includes a bioreactor, air strippers, and carbon filtration. Treated water is conveyed to surface water outfalls in both the southwest and northeast quadrants for discharge at rates proportional to recovery from each respective quadrant. The discharge is monitored via weekly sampling in accordance with MDE permits.
- Monitoring of constituents of concern in both monitoring wells and private supply wells is conducted on a regular schedule as directed by MDE.

4.0 Current Remedial Activities

This section presents a detailed discussion of the current remediation systems, which were summarized in the previous section.

4.1 System Design

In addition to **Figure 5**, which shows the layout of remediation system components on the Site and surrounding properties, process flow diagrams providing an overview of the remediation system process streams and equipment are attached as **Figures 6** through **8**. Specific design aspects of the main components of the remediation systems are described in the following sections.

4.1.1 Extraction Well Layout and Construction

Recovery activity is currently conducted on up to 88 monitoring wells (extraction wells), which are generally located along the strike line, as shown on **Figure 5**. Construction of these wells varies, and is summarized on **Table 1**, with diameters ranging from 2 to 6 inches, and total depths ranging from 10 feet to 98 feet below ground surface. Extraction wellheads are connected to subsurface remediation lines, including SVE piping, pneumatic air supply hoses and groundwater return hoses which are connected to the pumps. Wellheads are also equipped with valves, sample ports and instrumentation to allow for control and monitoring of operating pressures, flows and concentrations at each individual well.

4.1.2 Vapor Phase Hydrocarbon Recovery

Vapor phase hydrocarbon recovery is performed using six soil vapor extraction units, each with the capacity for use as dual phase extraction units with minimal modification. Two of the six systems are currently used for DPE; the DPE Claw in the southwest and the ESD Dual Claw in the northeast. The six SVE/DPE systems are numbered to correspond to equipment locations shown on **Figure 5**. SVE/DPE wells are listed on **Table 1**.

Each system is summarized below:

Southwest SVE / DPE Systems

ESD Tri-Lobe (1) – This SVE system extracts vapors from onsite extraction wells. The extracted vapors are treated with vapor phase granular activated carbon.

Bisco Dual Claw (3) – This SVE system extracts vapors from extraction wells located on the Site, 3313 Papermill Road, 14217 Robcaste Road, and 14223 Robcaste Road. The extracted vapors are treated with vapor phase granular activated carbon.

MLE DPE Claw (4) – This high vacuum DPE system extracts soil vapors and groundwater from onsite extraction wells. The extracted vapors are treated with vapor phase granular activated carbon.

Northeast SVE / DPE Systems

ESD Dual Claw Skid I (6) – This SVE system extracts vapors from extraction wells located on 14307 Jarrettsville Pike, 3501 Hampshire Glen Court, 3503 Hampshire Glen Court and 3506 Hampshire Glen Court. The extracted vapors are treated with vapor phase granular activated carbon.

ESD Dual Claw (8A) – This SVE system extracts vapors and groundwater from extraction wells on 14301 Jarrettsville Pike and 14307 Jarrettsville Pike. The extracted vapors are treated with vapor phase granular activated carbon.

NE Bisco Dual Claw (8B) – This SVE system extracts vapors from extraction wells on 3506 Hampshire Glen Court, 3508 Hampshire Glen Court, and 3600 Hampshire Glen Court. The extracted vapors are treated with vapor phase granular activated carbon on 3418 Sweet Air Road.

SVE system operating data are presented in the *Quarterly Groundwater Monitoring and Remedial Status Reports.* Influent vapor to each system is controlled manually at the individual wellheads by ball valves situated below grade within each well vault. Each SVE well is connected to an underground HDPE trunk line for each individual SVE system. Additional subsurface HDPE lines and junctions are installed which allow for flexibility to redirect SVE wells to different SVE systems, if warranted. Each individual SVE system includes variable speed drive motors on the SVE blowers, valves, sample ports, and instrumentation for control and monitoring of operating pressures, flows and concentrations. Off-gas from each SVE system is directed through vapor phase granulated activated carbon units prior to discharge in compliance with the MDE Air and Radiation Management Administration (ARMA) general permit for Soil Vapor Extraction Systems as described in Section 6.2. When acting as a DPE unit, the recovered liquids are pumped into a manifold located in the inactive service station building and directed into the groundwater treatment system.

Each SVE system includes interlocks which shut down the SVE system on various alarm conditions, including high temperature, high sump levels, and low vacuum. SVE system operation and alarm status is monitored remotely via a supervisory control and data acquisition (SCADA) system. The SCADA system is connected to an auto-dialer which notifies system operators by telephone of any alarm conditions, 24 hours per day, seven days per week. Upon notification of an alarm condition, system operators log on to the SCADA system remotely to view system status and address conditions, as appropriate.

4.1.3 Groundwater Recovery and Treatment

Groundwater recovery is being conducted at monitoring wells, as listed on **Table 1** to maintain hydraulic capture and recover dissolved phase hydrocarbon constituents. In addition to the submersible pumps, the pumping system includes primary and secondary air compressors, pneumatic air lines, water return piping, and water storage, conveyance and treatment equipment. Recovered groundwater accumulates in frac tanks located on the Sweet Air Road property and the Site. The groundwater is then treated onsite, as described in Section 4.1.3.1, and discharged in accordance with the NPDES permit, described in Section 6.1.

Recovered groundwater from the northeast quadrant is held in influent frac tanks on 3418 Sweet Air Road prior to being pumped to the Site for treatment. Recovered groundwater from the southwest quadrant is held in influent frac tanks on the Site prior to treatment. At the Site, recovered groundwater from both the northeast and southwest quadrants is directed through a manifold to either a fluidized bed bioreactor or an air stripper system for treatment. Water from each treatment train is then pumped through liquid-phase granular activated carbon, and into an effluent equalization tank. The treated water is then pumped from the effluent equalization tank and discharged proportionally according to the recovery rates from both the southwest and the northeast areas. The northeast portion of treated water is pumped back across the intersection for discharge to the northeast outfall and the southwest portion of treated water is discharged to the southwest outfall as depicted on **Figure 5**.

Groundwater recovered from monitoring wells is directed to different treatment trains based on monthly concentration and flow data, with generally the highest concentration zones being directed to the bioreactor, up to a maximum total influent flow rate of 30 gallons per minute. If recovered flow rates for the combined bioreactor influent stream exceed the maximum allowable rate for the bioreactor, an automatic motor operated valve (MOV) transfers excess flow into an air stripper treatment system. Lower concentration groundwater recovery zones are typically directed to a second air stripper treatment system. The bioreactor stream consists of particulate bag filters, an influent sump with nutrient feed and pH adjustment, a fluidized bed designed for upflow of process water through the biomedia, and a treated water sump where re-oxygenation occurs. The air stripper treatment systems include influent equalization/aeration tanks for precipitation and settling of dissolved solids, particulate bag filters for removal of suspended solids prior to the air stripper, and an air stripper for removal of volatile organic compounds from the groundwater. Air stripper and aeration tank off-gas is treated with VGAC units prior to discharge in accordance with MDE permit conditions. Subsequent to treatment, all liquid streams are pumped through three dedicated 2,000-pound liquid granulated activated carbon (LGAC) vessels for polishing prior to discharge to the effluent equalization tank. The treated groundwater is then discharged in accordance with the NPDES permit, described in Section 6.1.

Groundwater extraction and treatment system equipment are integrated with a programmable logic control (PLC) system and fail-safes. The fail-safes include interlocks which shut down the groundwater extraction and treatment equipment on various alarm conditions, including high sump and tank levels, high pressures and low air stripper pressures. System operations are monitored and controlled remotely via the SCADA system, which is connected to an auto-dialer which notifies system operators by telephone of any alarm conditions, 24 hours per day, seven days per week. Upon notification of an alarm condition, system operators log on to the SCADA system remotely to view system status and address conditions, as appropriate.

5.0 Proposed Activities

5.1 Proposed System

The remediation goal is to return groundwater to conditions that are protective of public health and the environment or achieve contamination levels at or below the Department's current groundwater standards and action levels where possible as determined by the Department. Based on the results that have been achieved with the current system, it is proposed to continue operation of the current soil vapor extraction, groundwater recovery and treatment systems. The proposed activities included in this CAP are proven technologies which are currently being implemented with positive results. Routine monitoring is conducted to evaluate progress, and includes monitoring groundwater quality and potentiometric surface elevations, as well as remediation system influent and effluent hydrocarbon concentrations. These data are presented in quarterly reports and discussed with the MDE at periodic technical review meetings. To the extent warranted, any modifications are presented to the MDE for its review and approval prior to implementation.

5.2 Potential Enhancements

Kleinfelder has and continues to evaluate ways to enhance and optimize the existing remediation system. Supplemental remedial measures may be proposed by EMES or may be required by the MDE. One of the primary purposes for implementation of supplemental remedial measures is to expedite achievement of the above-noted remedial goals. A key pre-requisite for any EMES proposed supplemental remedial measure will be a determination that the proposed supplemental work will not interfere with or minimize the effectiveness of the existing remedial measures as described in this CAP. Proposed supplemental remedial activities will only be conducted with approval from the MDE and in accordance with approval conditions established by the MDE.

6.0 Permit Identification

Remediation activities are being conducted in compliance with the appropriate operating permits required by the State of Maryland. Permits will be renewed as necessary, and additional permits will be obtained as required if additional remediation activities are proposed in the future. Current permitted activities are summarized in the following sections.

6.1 Surface Water Discharge

The recovered groundwater is treated and discharged to surface water tributaries located to the northeast and the southwest of the Site in accordance with the current National Pollutant Discharge Elimination System (NPDES) modified General Discharge Permit No. 2008-OGR-9826 (MDG919826) which was issued by the Maryland Department of the Environment on February 14, 2008. The General Discharge Permit expires on December 12, 2012, and a renewal application is to be filed at least 180 days prior to the expiration. Results of NPDES permit required monitoring are submitted to the MDE in quarterly Discharge Monitoring Reports, as required.

6.2 Off-gas Vapor Emissions

Vapor emission point sources (SVE treatment units and air stripper off-gas) are operated in compliance with the MDE Air and Radiation Management Administration ARMA General Permit for SVE and Groundwater Air Strippers. Emissions from each point source are currently below the permit thresholds listed below:

Parameter	Permit Limit
Total VOC	20 lbs/day
Benzene	0.02 lbs/hr

Despite operation below these permit limits prior to off-gas treatment, vapor emissions from the SVE blowers and air strippers will continue to be treated through vapor phase granular activated carbon units prior to discharge to the atmosphere. Vapor emission point sources will continue to be evaluated to determine whether the potential emissions warrant an air permit.

6.3 Water Appropriations

Water Appropriation and Use Permits BA2006G103(01) and BA2006G003(02) were issued (after public notice and comment) by the MDE Water Management Administration with an effective date of June 1, 2008. The combined maximum average withdrawal granted by the supplemental permits is 58,000 gallons per day on an annual basis and 84,100 gallons per day during the month of maximum use. Water can be drawn from a total of 100 wells as stipulated in the two permits. The permits expire on June 1, 2010, and a renewal application is to be filed at least 45 days prior to the expiration. Data are submitted to the MDE Water Management Administration, as required.

7.0 Monitoring and Sampling

Monitoring of remediation activities is ongoing and will continue in order to maintain compliance with operating permits, confirm proper operation and maintenance of system components, optimize system performance, and evaluate remediation progress. Permit-required monitoring and reporting will be conducted to maintain compliance with the operating permits listed in Section 6 of this CAP.

Groundwater concentrations and potentiometric surface elevations will be monitored according to the MDE-approved schedule in order to evaluate remediation progress. The groundwater monitoring schedule is detailed in the February 28, 2008 *Future Sampling Proposal – Groundwater Monitoring Well Network plan* and the MDE's May 20, 2008 approval letter, and generally includes monthly gauging of most monitoring wells, monthly sampling of select monitoring wells, quarterly or semi-annual sampling of the remaining wells, and quarterly sampling of surface water. Additionally, area private supply wells are generally sampled on monthly, quarterly, and semi-annual schedules, as directed by the MDE. Monitoring well and private supply well sampling results are reported to the MDE quarterly.

Both the groundwater and soil vapor extraction systems' influent streams are also monitored for influent petroleum constituent concentrations and flow rates to optimize effectiveness of recovery and treatment equipment, and to gauge the overall progress of remediation activities. Remediation system data are summarized in the quarterly *Groundwater Monitoring and Remedial Status Reports*.

Additional data are collected from remediation equipment to monitor the mechanical components for proper operation and to confirm preventative maintenance needs, as recommended by the equipment manufacturers.

8.0 Proposed Implementation Schedule

The system as described in this CAP has been implemented. Remediation activities will continue as outlined in this CAP until directed otherwise by the MDE, pending receipt of comments from the MDE on this Corrective Action Plan. In the event EMES believes supplemental remedial activities are necessary, such activities will only be conducted with written approval from the MDE and in accordance with approval conditions established by the MDE. Any proposal to conduct supplemental remedial activities will include a proposed schedule for MDE's review and approval.

FIGURES

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PROJECT NO.	88407
DRAWN:	10/21/08
DRAWN BY:	B. Myers
CHECKED BY:	S. Rochford
FILE NAME:	Fig1 Site Plan 052708.mxd

SITE PLAN
AS OF DECEMBER 23, 2008

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE
1

0 60 120 240
Feet

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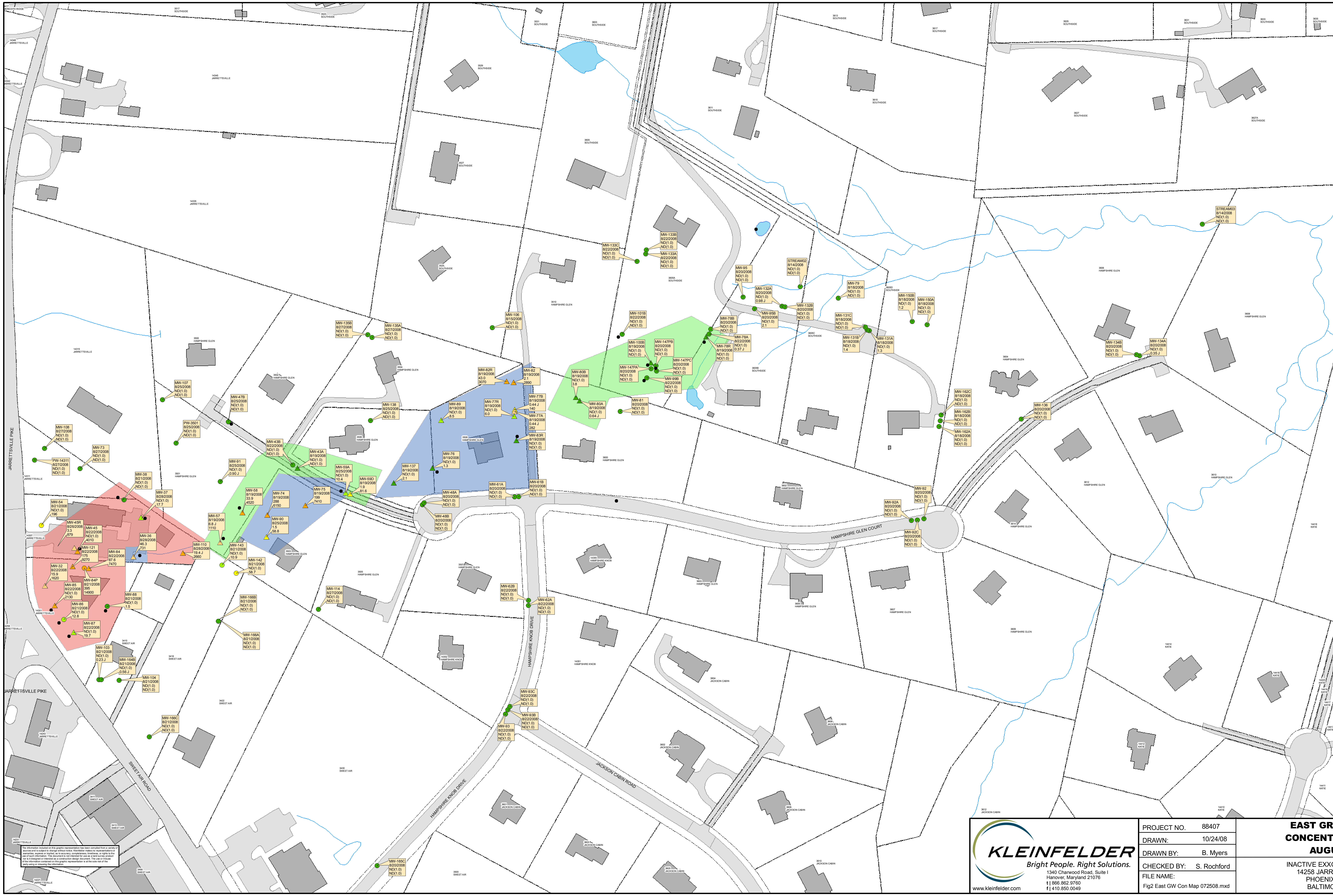
PROJECT NO.	88407
DRAWN:	10/24/08
DRAWN BY:	B. MYERS
CHECKED BY:	J. Hale
FILE NAME:	Fig 4_5_6 Pontentio Sfc Maps 052108.mxd

POTENTIOMETRIC SURFACE MAP
GAUGING EVENT: SEPTEMBER, 2008

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE
2



Legend

Concentrations

MTBE (µg/L)

- ND(RL≤5.0) - 5.0
- 5.0 - 20
- 20 - 200
- 200 - 2000
- 2000 - 20000
- 20000 - 200000
- 200000+
- Not Sampled in Qtr.:Dry/Inaccessible
- Monitoring Only
- Recovery Activity

Groundwater Recovery Zones

- Zone 1
- Zone 2
- Zone 3
- Parcel Boundary (Approx.)
- Building Foot Prints
- Streams
- Water Bodies

Well ID
Sample Date
Benzene (µg/L)
MTBE (µg/L)

J = INDICATES AN ESTIMATED VALUE
ND(RL) = NOT DETECTED AT OR ABOVE THE LABORATORY REPORTING LIMIT (RL) LABORATORY REPORTING LIMIT INCLUDED

NOTES:

1. MW-47A, MW-78C(60-70), MW-83 AND MW-94, MW-99A, MW-100A, MW-101A WERE DRY AT THE TIME OF SAMPLING
2. MW-59B WAS NOT SAMPLED DUE TO IMMOVABLE IN-WELL REMEDIAL EQUIPMENT
3. MW-15, MW-20, MW-41A, MW-41B, MW-42B, MW-47B, MW-48A, MW-48B, MW-61A, MW-62B, MW-73, MW-78A, MW-83R, MW-91, MW-92, MW-93, MW-97, MW-99B, MW-101B, MW-104, MW-106, MW-108, MW-114, MW-128A, MW-129A, MW-129B, MW-130, MW-133A, MW-133B, MW-135A, MW-135B, MW-136, MW-50A WERE REVISED TO A BI-ANNUAL SCHEDULE

GROUNDWATER RECOVERY ZONES:

ZONE 1:
MW-36, MW-59A, MW-59B, MW-74, MW-75, MW-76, MW-77A, MW-77B, MW-77R, MW-82, MW-82R, MW-83R, MW-89, MW-90, MW-137

ZONE 2:
MW-43A, MW-57, MW-58, MW-59D, MW-78A, MW-80B, MW-100B, MW-78R, MW-80A

ZONE 3:
MW-37, MW-38, MW-45, MW-45R, MW-84, MW-85, MW-86, MW-87, MW-88, MW-110, MW-121

0 45 90 180 Feet

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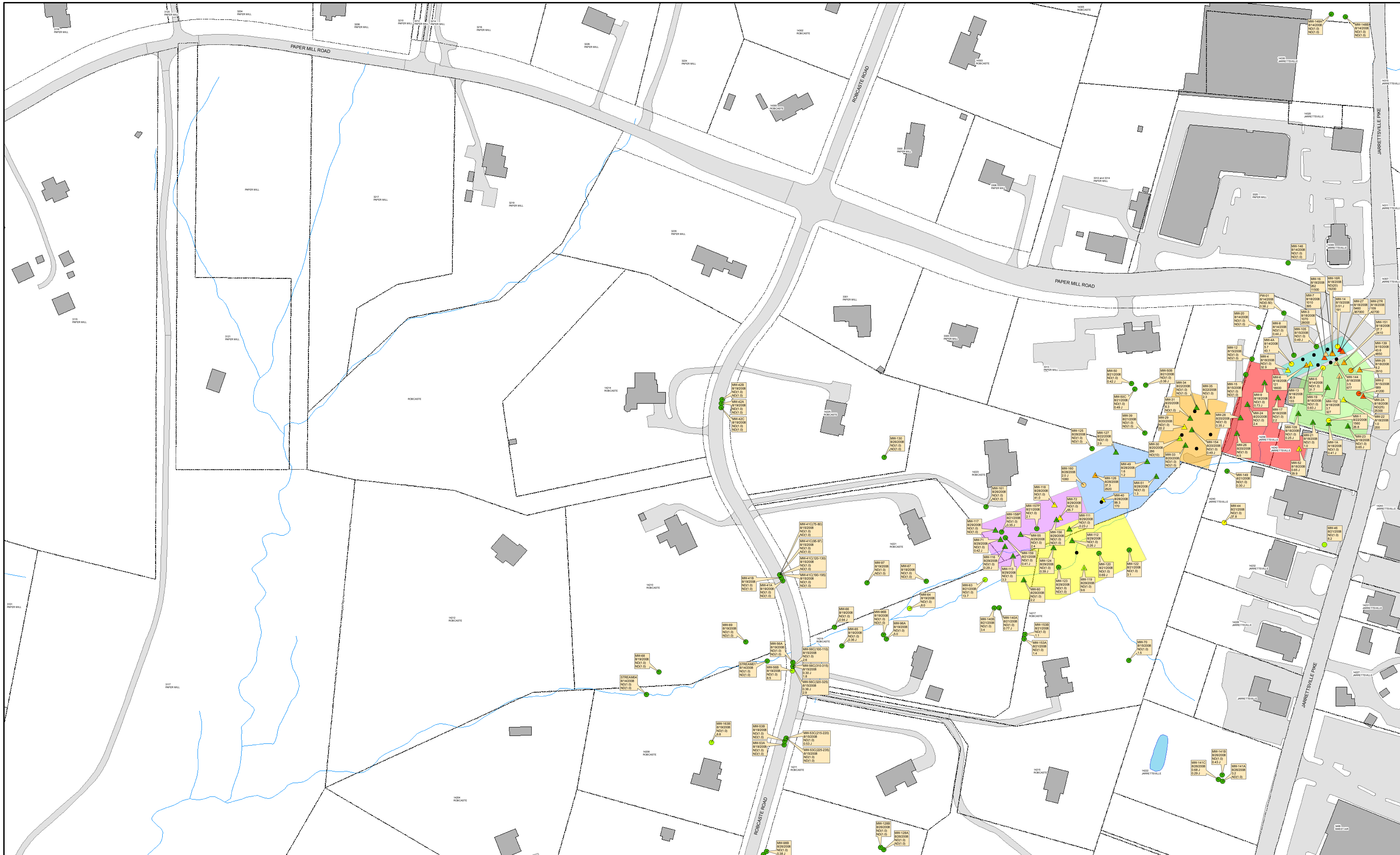
PROJECT NO.	88407
DRAWN:	10/24/08
DRAWN BY:	B. Myers
CHECKED BY:	S. Rochford
FILE NAME:	Fig2 East GW Con Map 072508.mxd

EAST GROUNDWATER CONCENTRATION MAP - AUGUST 2008

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE
3



Legend

Concentrations

MTBE (µg/L)

- ND(RL≤5.0) - 5.0
- 5.0 - 20
- 20 - 200
- 200 - 2000
- 2000 - 20000
- 20000 - 200000
- 200000+
- Not Sampled in Qtr.:Dry/Inaccessible
- Monitoring Only
- Recovery Activity

Groundwater Recovery Zones

- Zone A
- Zone B
- Zone C
- Zone D
- Dispenser Island
- DPE
- Zone E
- Parcel Boundary (Approx.)
- Building Foot Prints
- Streams
- Water Bodies

Well ID
Sample Date
Benzene (µg/L)
MTBE (µg/L)

J = ESTIMATED VALUE
ND(RL) = NOT DETECTED AT OR ABOVE THE LABORATORY REPORTING LIMIT(RL) LABORATORY REPORTING LIMIT INCLUDED

NOTES:

1. MW-102 WAS DRY AT THE TIME OF SAMPLING
2. MW-155 WAS NOT SAMPLED DUE TO IMMOVABLE IN-WELL REMEDIAL EQUIPMENT
3. STREAM04 IS AN ALTERNATE SAMPLE LOCATION FOR STREAM01 (UPGRADIENT)
4. MW-15, MW-20, MW-41A, MW-41B, MW-42B, MW-47B, MW-48A, MW-48B, MW-61A, MW-62B, MW-73, MW-78A, MW-83R, MW-91, MW-92, MW-93, MW-97, MW-99B, MW-101B, MW-104, MW-106, MW-108, MW-114, MW-128A, MW-129A, MW-129B, MW-130, MW-133A, MW-133B, MW-135A, MW-135B, MW-136, MW-50A WERE REVISED TO A BI-ANNUAL SCHEDULE

GROUNDWATER RECOVERY ZONES:

ZONE DISPENSER ISLAND:
MW-1A, MW-2A, MW-19, MW-21, MW-22, MW-23, MW-25, MW-109, MW-151, MW-152

ZONE DPE:
MW-3, MW-4, MW-6, MW-7, MW-13, MW-16, MW-16R, MW-27, MW-27R

ZONE A:
MW-9, MW-17, MW-24, MW-26, MW-28, MW-52

ZONE B:
MW-29, MW-30, MW-31, MW-33, MW-34, MW-35, MW-154

ZONE C:
MW-40, MW-49, MW-51, MW-126, MW-127, MW-155

ZONE D:
MW-60, MW-102, MW-111, MW-112, MW-119, MW-123, MW-124

ZONE E:
MW-55, MW-71, MW-72, MW-113, MW-117, MW-116, MW-118

0 45 90 180 Feet

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PROJECT NO.	88407
DRAWN:	10/16/08
DRAWN BY:	B. Myers
CHECKED BY:	S. Rochford
FILE NAME:	Fig3 West GW Con Map 072508.mxd

WEST GROUNDWATER CONCENTRATION MAP - AUGUST 2008

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE 4

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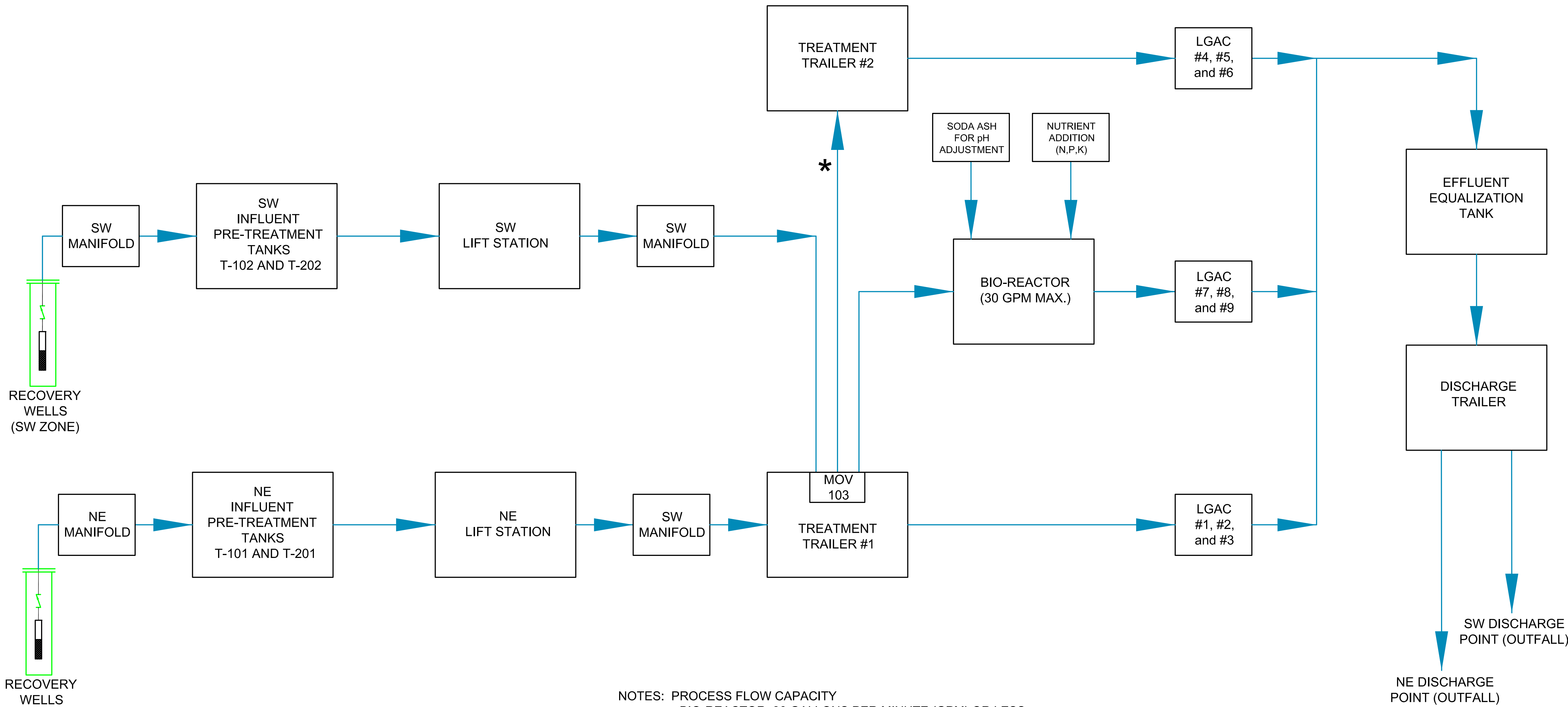
PROJECT NO.	88407
DRAWN:	12/26/08
DRAWN BY:	A. Patterson
CHECKED BY:	L. Schultheis
FILE NAME:	Fig7 Rem Layout 052708.mxd

REMEDIATION LAYOUT AS OF DECEMBER 23, 2008

INACTIVE EXXON FACILITY #28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND
BALTIMORE COUNTY

FIGURE 5



NOTES: PROCESS FLOW CAPACITY
- BIO-REACTOR: 30 GALLONS PER MINUTE (GPM) OR LESS
* - EXCESS FLOW CAPACITY >30 GPM TO TREATMENT TRAILER #2

HANOVER, MD Final Process Flow Diagram 072808.dwg

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DRAWN BY:	BNM
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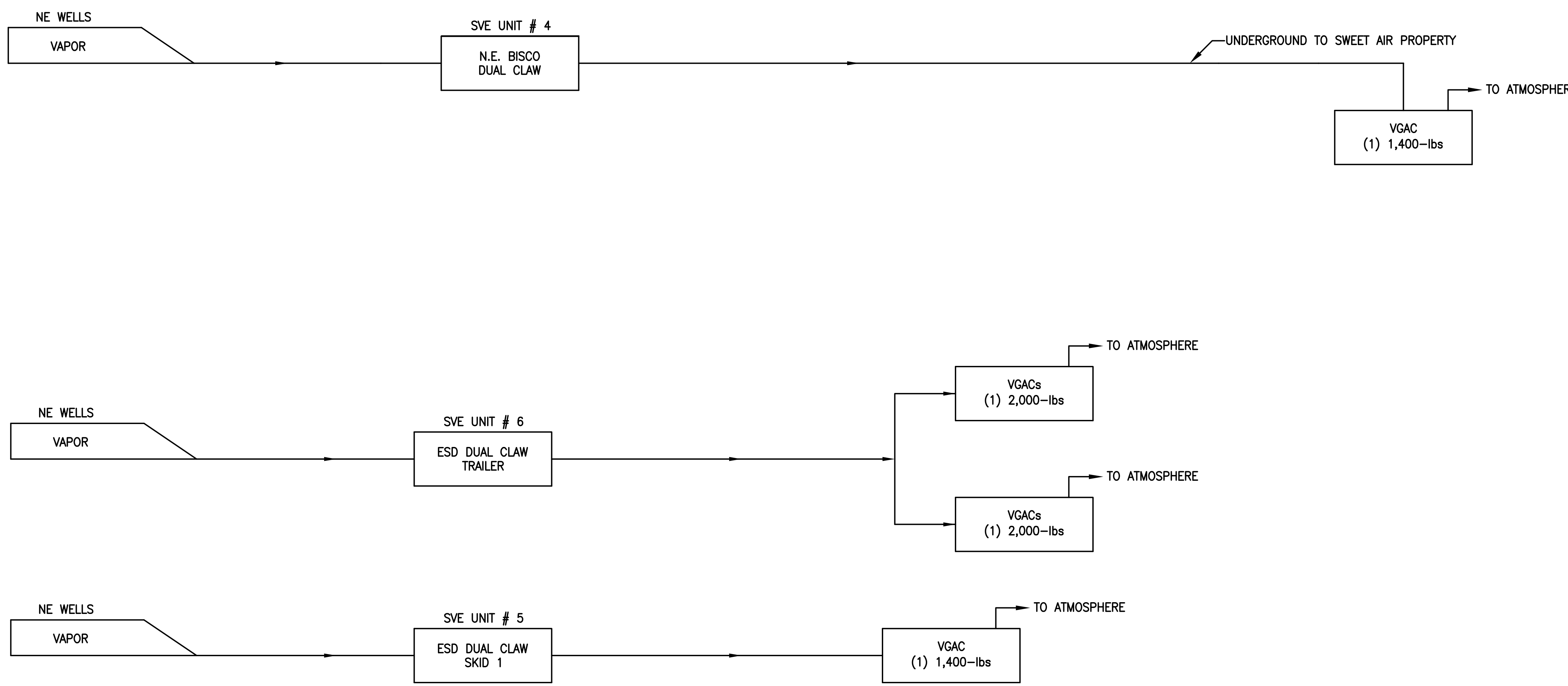
FILE NAME:	

GROUNDWATER RECOVERY AND TREATMENT PROCESS FLOW DIAGRAM

INACTIVE EXXON FACILITY # 28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND

FIGURE
6



SCALE: NOT TO SCALE

SOURCE: KLEINFELDER FIELD RESEARCH

HANOVER, MD

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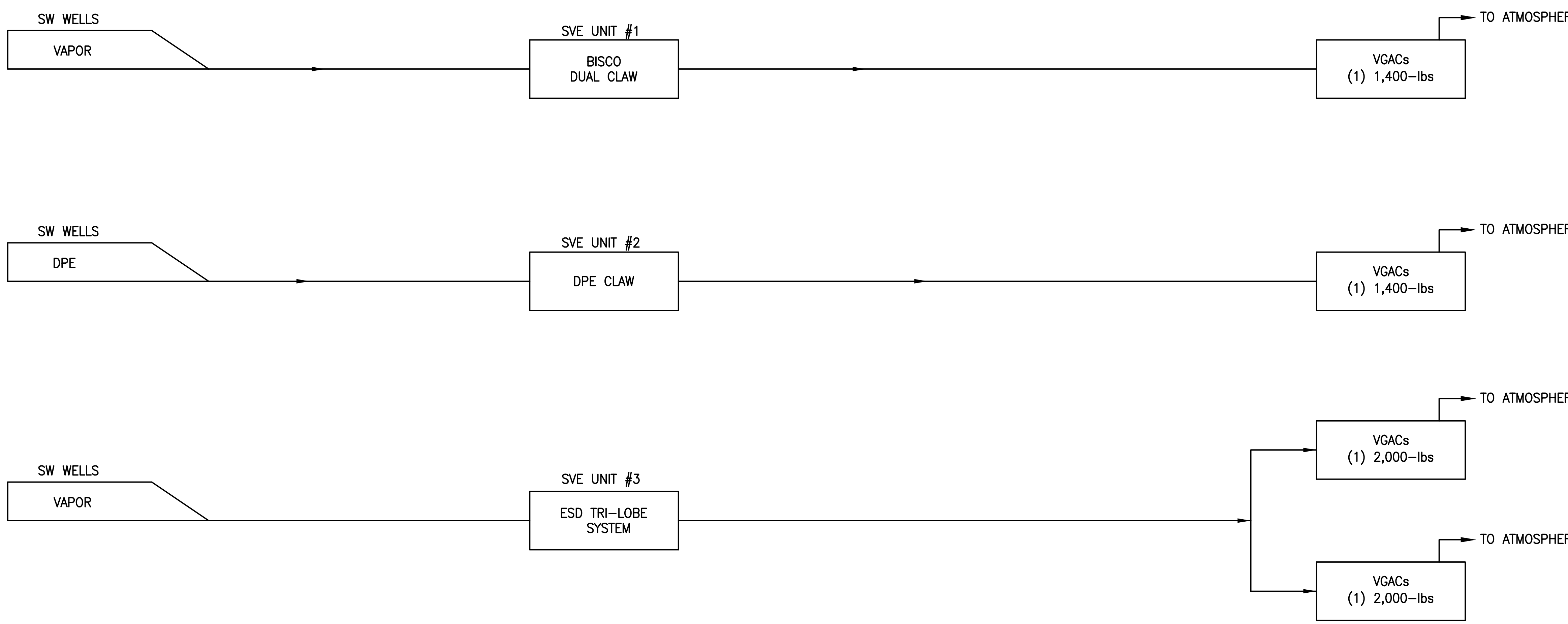
PROJECT NO.	88407
DRAWN:	12/03/2007
DRAWN BY:	ANG
CHECKED BY:	BNM
FILE NAME:	

NORTHEAST SOIL VAPOR RECOVERY AND TREATMENT PROCESS FLOW DIAGRAM

INACTIVE EXXON FACILITY # 28077
14258 JARRETSVILLE PIKE
PHOENIX, MARYLAND

FIGURE

7



Note: See SVE unit P&IDs for system details and source wells.

SCALE: NOT TO SCALE

SOURCE: KLEINFELDER FIELD RESEARCH

HANOVER, MD

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PROJECT NO.	88407
DRAWN:	12/03/2007
DRAWN BY:	ANG
CHECKED BY:	BNM
FILE NAME:	

SOUTHWEST SOIL VAPOR RECOVERY AND TREATMENT PROCESS FLOW DIAGRAM

INACTIVE EXXON FACILITY # 28077
14258 JARRETTSVILLE PIKE
PHOENIX, MARYLAND

FIGURE

8

TABLE

Table 1
Well Construction and Remediation Well Summary
Inactive Exxon Facility # 28077
14258 Jarrettsville Pike
Phoenix, MD
December 23, 2008

Well ID	Borehole Diameter (inch)	Well Diameter (inch)	Riser/ Casing Length (feet)	Screen Length/ Open Interval (feet)	Total Borehole Depth (feet)	Screen Interval (feet below TOC)	TOC Elevation	Pump Type	SVE/DPE	Comment
MW-1	6	2	20	25	45	20-45	586.80			
MW-1A	10	6	35	20	55	35-55	586.09	Pneumatic	SVE	
MW-2	6	2	20	30	50	20-50	588.28			
MW-2A	10	6	35	20	55	35-55	587.56	Pneumatic	SVE	
MW-3	6	2	20	30	50	20-50	590.83		DPE	
MW-3P	6	2	30	20	50	30-50	590.09			
MW-4	6	2	15	35	50	15-50	588.41	Pneumatic	SVE	
MW-4A	10	6	35	20	55	35-55	589.08			
MW-5	10	6	20	25	45	20-45	589.74			
MW-6	10	6	20	30	50	20-50	589.01		DPE	
MW-6P	6	2	30	20	50	30-50	590.47			
MW-7	10	6	20	35	55	20-55	591.79	Pneumatic	SVE	
MW-8	8	4	25	20	45	25-45	590.75			
MW-9	8	4	25	25	50	25-50	589.57	Pneumatic	SVE	
MW-10*	10	~	~	~	34.5	~	~			
MW-11*	10	~	~	~	150	~	~			
MW-12	10	4	20	15	35	20-35	587.90			
MW-13	8	4	25	10	35	25-35	589.30		DPE	
MW-13P	6	2	30	20	50	30-50	591.54			
MW-14	8	4	20	25	45	20-45	593.61			
MW-15	10	4	15	20	35	15-35	584.29			
MW-16	8	4	20	18	38	20-38	591.99		DPE	
MW-16R	10	6	45	15	60	45-60	591.89	Pneumatic	SVE	
MW-17	8	4	25	25	50	25-50	589.14	Pneumatic	SVE	
MW-18*	10	~	~	~	46	~	~			
MW-19	10	6	20	25	45	20-45	587.43	Pneumatic	SVE	
MW-20	8	4	20	20	40	20-40	592.80			
MW-21	10	6	20	25	45	20-45	586.81	Pneumatic	SVE	
MW-22	10	6	20	25	45	20-45	587.01	Pneumatic	SVE	
MW-23	10	6	20	25	45	20-45	585.66	Pneumatic	SVE	
MW-24	8	4	20	15	35	20-35	580.52	Pneumatic	SVE	
MW-25	10	6	25	30	55	25-55	592.34	Pneumatic	SVE	
MW-26	10	6	25	20	45	25-45	578.75	Pneumatic	SVE	
MW-27	10	6	27	16	43	27-43	592.89		DPE	
MW-27P	6	2	35	20	55	35-55	592.96			
MW-27R	10	6	30	30	60	30-60	593.00	Pneumatic	SVE	
MW-28	10	6	20	25	46	20-45	582.98	Pneumatic	SVE	
MW-29	10	6	10	20	30	10-30	571.52	Pneumatic	SVE	
MW-30	10	6	10	25	35	10-35	571.22	Pneumatic	SVE	
MW-30P	3	1	15	15	30	15-30	564.35			
MW-31	10	6	10	20	30	10-30	571.92	Pneumatic	SVE	
MW-32	10	6	30	20	50	30-50	593.09	Pneumatic	SVE	
MW-33	10	6	10	20	30	10-30	570.80	Pneumatic	SVE	
MW-33P	3	1	15	25	40	15-40	563.65			
MW-34	10	6	10	20	30	10-30	572.49	Pneumatic	SVE	
MW-34P	3	1	18	20	38	18-38	565.06			
MW-35	10	6	10	20	30	10-30	571.95	Pneumatic	SVE	
MW-36	10	6	15	30	50.5	15-45	590.49		DPE	
MW-36P	6	2	15	30	45	15-45	589.83			
MW-37	10	6	40	56	100	40-96	591.26	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-37P	6	2	36	60	98	36-96	590.81			
MW-38	10	6	23	40	70	23-63	595.05		SVE	SVE Inactive during the quarter (through 12/23/08)
MW-38P	6	2	23	40	63	23-63	595.92			
MW-39	10	6	15	20	35	15-35	574.80			
MW-40	10	6	5	25	30	5-30	559.08	Pneumatic	SVE	
MW-41A	6	2	15	20	35	15-35	549.12			
MW-41B	6	2	48	10	58	48-58	549.55			
MW-41C	6	~	60	290	350	60-350	549.33			
MW-42A	6	2	15	20	35	15-35	579.72			
MW-42B	6	2	45	10	55	45-55	580.00			
MW-42C	6	6	60	290	350	60-350	579.43			
MW-43A	6	2	20	20	40	20-40	576.08	Pneumatic	SVE	Did not pump during the quarter (through 12/23/08)
MW-43B	6	2	45	10	55	45-55	576.94			
MW-44	8	4	20	20	40	20-40	577.62			
MW-45	10	6	53	20	75	53-73	593.71	Pneumatic	SVE	

Table 1
Well Construction and Remediation Well Summary
Inactive Exxon Facility # 28077
14258 Jarrettsville Pike
Phoenix, MD
December 23, 2008

Well ID	Borehole Diameter (inch)	Well Diameter (inch)	Riser/ Casing Length (feet)	Screen Length/ Open Interval (feet)	Total Borehole Depth (feet)	Screen Interval (feet below TOC)	TOC Elevation	Pump Type	SVE/DPE	Comment
MW-45P	6	2	52.5	20	72.5	52.5-72.5	593.30			
MW-45R	8	6	70	20	90	70-90	593.80	Pneumatic	SVE	
MW-46	8	4	35	25	60	35-60	587.70			
MW-47A	6	2	20	20	40	20-40	583.91			
MW-47B	6	2	45	10	55	45-55	583.85			
MW-48A	6	2	20	20	40	20-40	569.69			
MW-48B	6	2	45	10	55	45-55	569.60			
MW-49	10	6	20	25	45	20-45	567.89	Pneumatic	SVE	
MW-50	8	4	20	20	40	20-40	581.85			
MW-50B	6	2	45	10	55	45-55	581.93			
MW-50C	6	6	60	240	300	60-300	581.69			
MW-51	10	6	20	25	45	20-45	566.21	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-52	10	6	20	50	70	20-70	582.08	Pneumatic	SVE	
MW-53A	6	2	15	20	35	15-35	539.98			
MW-53B	6	2	45	10	55	45-55	539.64			
MW-53C	6	6	60	290	350	60-350	538.57			
MW-54	10	6	16	40	56	16-56	597.83			
MW-55	10	6	10	30	40	10-40	552.25	Pneumatic	SVE	
MW-56A	6	2	15	20	35	15-35	540.23			
MW-56B	6	2	45	10	55	45-55	540.28			
MW-56C	6	6	60	290	350	60-350	540.30			
MW-57	10	6	25	40	65	25-65	583.18	Pneumatic	SVE	
MW-57P	6	2	20	50	70	20-70	582.60			
MW-58	10	6	35	30	65	35-65	581.51	Pneumatic	SVE	
MW-58P	6	2	20	50	70	20-70	582.64			
MW-59A	6	2	20	20	40	20-40	571.01		SVE	
MW-59B	6	2	45	10	55	45-55	571.19			
MW-59D	10	6	23	25	50	23-48	571.04	Pneumatic	SVE	
MW-60	10	6	10	30	40	10-40	549.37	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-61A	6	2	15	20	35	15-35	563.92			
MW-61B	6	2	45	10	55	45-55	563.53			
MW-62A	6	2	25	20	45	25-45	578.24			
MW-62B	6	2	45	10	55	45-55	577.89			
MW-63	10	6	16	20	40	16-36	546.62			
MW-64	10	6	5	25	30	5-30	540.47			
MW-65	10	6	5	25	30	5-30	536.39			
MW-66	10	6	5	25	30	5-30	535.53			
MW-67	10	6	10	30	40	10-40	542.78			
MW-68	8	4	5	25	30	5-30	526.39			
MW-69	8	4	5	25	30	5-30	533.06			
MW-70	10	6	25	25	50	25-50	558.70			
MW-71	10	6	10	30	40	10-40	552.37	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-72	10	6	10	30	40	10-40	556.45	Pneumatic	SVE	
MW-73	10	6	20	40	60	20-60	600.37			
MW-74	10	6	20	30	50	20-50	577.18	Pneumatic	SVE	
MW-75	10	6	25	25	50	25-50	574.00	Pneumatic	SVE	
MW-76	10	6	20	36	56	20-56	559.30	Pneumatic	SVE	
MW-76P	6	2	20	30	50	20-50	560.29			
MW-77A	10	6	10	15	25	10-25	548.96	Pneumatic	SVE	
MW-77B	10	6	33	10	43	33-43	548.69	Pneumatic	SVE	
MW-77R	10	6	15	30	50	15-45	549.58	Pneumatic	SVE	
MW-78A	8	4	2	18	22	2-20	530.77			
MW-78B	10	4	35	10	45	35-45	530.42			
MW-78C	6	~	60	240	300	60-300	531.42			
MW-78R	10	6	20	50	75	20-70	530.49	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-79	8	4	2	8	10	2-10	521.42			
MW-80A	10	6	5	25	35	5-30	542.42	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-80B	10	6	38.5	10	48.5	38.5-48.5	542.58	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-81	10	6	5	20	25	5-25	540.77			
MW-82	10	6	5	20	25	5-25	546.31	Pneumatic	SVE	
MW-82R	10	6	3	35	46	3-38	546.84	Pneumatic	SVE	
MW-83	10	6	10	15	25	10-25	553.96			
MW-83R	10	6	20	30	50	20-50	554.78	Pneumatic	SVE	Did not pump/SVE inactive during quarter (through 12/23/08)
MW-84	10	6	40	20	60	40-60	592.95	Pneumatic	SVE	
MW-84P	6	2	40	20	60	40-60	593.13			

Table 1
Well Construction and Remediation Well Summary
Inactive Exxon Facility # 28077
14258 Jarrettsville Pike
Phoenix, MD
December 23, 2008

Well ID	Borehole Diameter (inch)	Well Diameter (inch)	Riser/ Casing Length (feet)	Screen Length/ Open Interval (feet)	Total Borehole Depth (feet)	Screen Interval (feet below TOC)	TOC Elevation	Pump Type	SVE/DPE	Comment
MW-85	10	6	40	20	60	40-60	591.65	Pneumatic	SVE	
MW-85P	6	2	35	25	60	35-60	591.17			
MW-86	10	6	40	20	60	40-60	591.05		SVE	SVE Inactive during the quarter (through 12/23/08)
MW-86P	6	2	35	25	60	35-60	590.86			
MW-87	10	6	40	20	60	40-60	590.96	Pneumatic	SVE	
MW-87P	6	2	35	25	60	35-60	590.62			
MW-88	10	6	37.5	20	60	37.5-57.5	592.43			
MW-88P	6	2	40	20	60	40-60	592.71			
MW-89	8	4	10	25	40	10-35	562.36	Pneumatic	SVE	
MW-90	10	6	20	30	50	20-50	578.33		SVE	
MW-91	10	6	42	30	75	42-72	585.77			
MW-92	6	2	69	40	109	69-109	557.70			
MW-92A	8	4	20	20	40	20-40	558.49			
MW-92C	6	6	60	340	400	60-400	558.10			
MW-93	6	2	27	15	45	27-42	578.44			
MW-93B	8	4	55	20	75	55-75	578.32			
MW-93C	6	6	80	220	300	80-300	579.02			
MW-94	6	2	17	15	37	17-32	558.28			
MW-95	6	2	2	18	21	2-20	528.49			
MW-95B	6	4	70	5	75	70-75	529.01			
MW-96A	8	4	4	20	25	4-24	539.78			
MW-96B	8	4	38	15	55	38-53	539.26			
MW-97	8	4	4	20	24	4-24	541.31			
MW-98A	6	2	25	16	41	25-41	547.07			
MW-98B	10	6	48	10	65	48-58	547.14			
MW-99A	10	6	3	12	15	3-15	535.46			
MW-99B	10	6	28	10	42	28-38	534.29			
MW-100A	10	6	3	12	15	3-15	534.92			
MW-100B	10	6	31	10	45	31-41	533.96	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-101A	10	6	3	12	15	3-15	537.64			
MW-101B	10	6	24	10	50	24-34	536.85			
MW-102	10	6	2	23	25	2-25	555.75	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-103	8	4	33	20	53	33-53	592.40			
MW-104	8	4	30	20	50	30-50	592.45			
MW-105	10	6	25	22	50	25-47	592.54			
MW-106	10	6	8.5	20	30	8.5-28.5	547.68			
MW-107	8	4	15	30	45	15-45	584.93			
MW-108	10	6	35	20	55	35-55	601.07			
MW-109	10	6	30	40	70	30-70	588.10	Pneumatic	SVE	
MW-110	10	6	25	35	60	25-60	585.10	Pneumatic	SVE	
MW-111	10	6	20	28	50	20-48	555.46	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-112	10	6	15	33	50	15-48	555.92	Electric	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-113	10	6	15	35	50	15-50	548.07	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-114	8	4	25	15	40	25-40	586.86			
MW-115*	8	~	~	~	48.5	~	~			
MW-116	10	6	12	53	65	12-65	551.68	Electric	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-117	10	6	10	50	67	10-60	554.29	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-118	10	6	20	20	40	20-40	562.90	Pneumatic	SVE	
MW-119	10	6	15	25	40	15-40	554.35	Pneumatic	SVE	
MW-120	10	6	15	25	40	15-40	554.00			
MW-121	10	6	35	25	60	35-60	593.80	Pneumatic	SVE	
MW-122	10	6	20	30	50	20-50	560.45			
MW-123	10	6	15	35	50	15-50	550.85	Pneumatic	SVE	Did not pump/SVE inactive during quarter (through 12/23/08)
MW-124	10	6	13	23	38	13-36	553.50	Pneumatic	SVE	SVE Inactive during the quarter (through 12/23/08)
MW-125	10	6	32	23	55	32-55	574.08			
MW-126	10	6	24	15	41	24-39	568.76	Pneumatic	SVE	
MW-127	10	6	28	25	53	28-53	571.25	Pneumatic	SVE	
MW-128A	10	6	38	20	58	38-58	561.55			
MW-128B	10	6	68	10	83	68-78	561.18			
MW-129A	10	6	25	20	45	25-45	566.56			
MW-129B	10	6	51	10	68	51-61	565.62			
MW-130	6	2	25	25	50	25-50	577.35			
MW-131A	6	2	5	15	25	5-20	526.33			
MW-131B	8	2	30	5	35	30-35	526.31			
MW-131C	6	6	60	240	300	60-300	526.00			

Table 1
Well Construction and Remediation Well Summary
Inactive Exxon Facility # 28077
14258 Jarrettsville Pike
Phoenix, MD
December 23, 2008

Well ID	Borehole Diameter (inch)	Well Diameter (inch)	Riser/ Casing Length (feet)	Screen Length/ Open Interval (feet)	Total Borehole Depth (feet)	Screen Interval (feet below TOC)	TOC Elevation	Pump Type	SVE/DPE	Comment
MW-132A	8	2	2	15	17	2-17	524.71			
MW-132B	8	2	25	5	30	25-30	524.45			
MW-133A	6	2	15	15	30	15-30	549.05			
MW-133B	6	2	40	10	50	40-50	549.22			
MW-133C	6	6	60	140	200	60-200	550.87			
MW-134A	6	2	28	25	55	28-53	544.04			
MW-134B	6	2	65	10	75	65-75	544.29			
MW-135A	8	4	20	20	40	20-40	560.64			
MW-135B	8	4	50	10	60	50-60	560.41			
MW-136	6	2	25	25	50	25-50	547.48			
MW-137	10	6	15	30	45	15-45	563.56	Pneumatic	SVE	
MW-138	10	6	14	30	45	14-44	570.58			
MW-139	10	6	60	20	80	60-80	592.43			
MW-140A	8	4	10	20	30	10-30	548.02			
MW-140B	8	4	40	15	55	40-55	547.49			
MW-141A	6	2	30	20	50	30-50	586.34			
MW-141B	6	2	60	10	70	60-70	586.42			
MW-141C	6	~	70	230	300	70-300	586.31			
MW-142	10	6	30	35	65	30-65	583.87			
MW-143	10	6	30	35	65	30-65	584.39			
MW-144	8	6	25	35	62.5	25-60	593.11		SVE	
MW-145P	3	1	15	25	40	15-40	564.11			
MW-146	8	4	35	25	60	35-60	601.84			
MW-147	10	2	~	~	80	~	534.63			
MW-147PA	6	2	8	72	80	8-80	534.53			
MW-147PB	10	2	8	72	80	8-80	534.43			
MW-147PC	6	2	8	72	80	8-80	534.52			
MW-148A	6	2	30	33	63	30-63	609.96			
MW-148B	6	2	73	10	83	73-83	608.97			
MW-149	10	6	19	30	50	19-49	589.94			
MW-150A	3	1	2	12	14	2-14	521.66			
MW-150B	3	1	24	10	34	24-34	520.83			
MW-151	8	4	35	25	60	35-60	594.74	Pneumatic	SVE	
MW-152	8	4	35	25	60	35-60	591.94	Pneumatic	SVE	
MW-153A	8	4	5	20	25	5-25	548.58			
MW-153B	8	4	35	10	45	35-45	548.46			
MW-154	10	6	20	40	60	20-60	563.03	Pneumatic	SVE	
MW-155	10	6	5	45	50	5-50	557.88		SVE	SVE Inactive during the quarter (through 12/23/08)
MW-156	10	6	20	50	70	20-70	555.98	Pneumatic	SVE	
MW-157P	6	2	10	50	60	10-60	552.64			
MW-158P	6	2	20	40	60	20-60	553.77			
MW-159	10	6	30	40	70	30-70	550.58			
MW-160	10	6	20	50	70	20-70	567.97			
MW-161	10	6	20	40	60	20-60	570.79			
MW-162A	6	4	35	10	45	35-45	547.33			
MW-162B	10	2	55	10	65	55-65	547.33			
MW-162C	6	6	60	240	300	60-300	546.27			
MW-163B	6	2	45	10	55	45-55	531.50			
MW-164B	8	4	60	15	75	60-75	592.56			
MW-165C	6	6	60	390	450	60-450	587.64			
MW-166A	8	4	40	20	60	40-60	590.15			
MW-166B	8	2	50	30	80	50-80	589.43			
PW3418	6	6	60	555	615	60-615	596.18			
PW14209	6	6	40	160	200	40-200	563.85			

TOC = Top of Casing
BTOC = Below Top of Casing
DPE = Dual Phase Extraction
SVE = Soil Vapor Extraction
NSVD = Not Surveyed to Vertical Datum
* = Well Abandoned
fbg = feet below grade

FLUTe liners were installed into the following wells:
- MW-41C (sample ports at 75-80 fbg, 95-97 fbg, 120-130 fbg, 190-195 fbg)
- MW-53C (sample ports at 215-220 fbg and 225-235 fbg)
- MW-56C (sample ports at 100-110 fbg, 310-315 fbg, 320-325 fbg)
- MW-78C (sample port at 60-70 fbg).

ATTACHED FILE

MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard, Baltimore MD 21230-1719
410-537-3000 • 1-800-633-6101

October 6, 2008

REC'D 10/13 OR 10/14

Mr. James F. Medlin
ExxonMobil Refining and Supply-Global Remediation
US Retail South Central Area
1413 Highway 17 South #183
Surfside Beach SC 29575-6090

RE: CORRECTIVE ACTION PLAN
Case No. 2006-0303-BA2
Jacksonville Exxon R/S No. 2-8077
14258 Jarrettsville Pike, Phoenix
Baltimore County, Maryland
Facility I.D. No. 12342

Dear Mr. Medlin:

This letter is written by the Maryland Department of Environment (MDE) in order to direct ExxonMobil to submit for approval a *Corrective Action Plan* (*CAP*) for the above-referenced site. The requirement for the *CAP* can be found in the Consent Decree entered into between MDE and ExxonMobil, Section VI, "Work to be Performed," paragraph 31 – 34. As agreed to in the Consent Decree, ExxonMobil shall submit the *CAP* for MDE's review within ninety (90) days upon the request of MDE. At this time, MDE formally requests submittal of the *CAP*.

If you have any questions, please contact me at 410-537-3443 or via Email: hmeade@mde.state.md.us.

Sincerely,

Herbert M. Meade, Administrator
Oil Control Program

HMM/nln

cc: Mr. Greg Martin (Roux Associates)
Ms. Ellen Jackson
Mr. Horacio Tablada