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8:49 am, Feb 04, 2010

Alameda County  
Environmental Health

Federal Correction Institution - Dublin  
5701 8<sup>th</sup> Street  
Dublin, California

January 20, 2010

Mr. Paresh Kharti  
Alameda County Health Care Services Agency  
Department of Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

Re: FCI - Dublin  
5701 8<sup>th</sup> Street  
Dublin, California  
ACHCSA Case No. 2977

Dear Mr. Kharti:

I, Armando Ledezma, of Federal Correction Institution – Dublin have retained MARCOR Environmental Remediation and their subcontractor Pangea Environmental Services, Inc. (Pangea) for the project referenced above. Pangea is submitting the attached *Site Investigation Report* on my behalf.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report is true and correct to the best of my knowledge.

Sincerely,



Armando Ledezma



January 30, 2010

***VIA ALAMEDA COUNTY FTP SITE***

Mr. Paresh Khatri  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

Re: **Site Investigation Report**  
Federal Correctional Institution  
5701 8<sup>th</sup> St. – Camp Parks, Dublin, CA  
SLIC Case No. RO0002977

Dear Mr. Khatri:

The Federal Correctional Institution – Dublin (FCI-Dublin) retained MARCOR Environmental Remediation (MARCOR) and its subcontractor, Pangea Environmental Services, Inc. (Pangea), to prepare this *Site Investigation Report* for the subject site. This report documents implementation of the *Soil and Groundwater Investigation Workplan with Preferential Pathway Evaluation* (Workplan) dated March 31, 2009, which was approved by Alameda County Environmental Health (ACEH) in a letter dated April 22, 2009.

If you have any questions or comments, please call me at (510) 435-8664.

Sincerely,  
**Pangea Environmental Services, Inc.**

A handwritten signature in blue ink, appearing to read "Bob Clark-Riddell".

Bob Clark-Riddell, P.E.  
Principal Engineer

Attachment: *Site Investigation Report*

cc: Mr. Armando Ledezma, FCI-Dublin, 5701 8<sup>th</sup> Street, Dublin, CA 94568  
SWRCB Geotracker (electronic copy)

**PANGEA Environmental Services, Inc.**

1710 Franklin Street, Suite 200, Oakland, CA 94612 Telephone 510.836.3700 Facsimile 510.836.3709 [www.pangeaenv.com](http://www.pangeaenv.com)



## SITE INVESTIGATION REPORT

**Federal Correction Institution  
5701 8<sup>th</sup> Street – Camp Parks  
Dublin, California 94568  
SLIC Case # RO0002977**

**January 30, 2010**

*Prepared for:*

Federal Correction Institution  
5701 8<sup>th</sup> Street – Camp Parks  
Dublin, California 94568

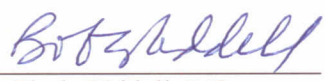
*Prepared by:*

Pangea Environmental Services, Inc.  
1710 Franklin Street, Suite 200  
Oakland, California 94612

*Written by:*



  
Morgan Gillies  
Project Manager

  
Bob Clark-Riddell, P.E.  
Principal Engineer

**PANGEA Environmental Services, Inc.**

## **INTRODUCTION**

The Federal Correctional Institution – Dublin (FCI-Dublin) retained MARCOR Environmental Remediation (MARCOR) and its subcontractor, Pangea Environmental Services, Inc. (Pangea), to prepare this *Site Investigation Report* for the subject site. This report documents implementation of the *Soil and Groundwater Investigation Workplan with Preferential Pathway Evaluation* (Workplan) dated March 31, 2009, which was approved by Alameda County Environmental Health (ACEH) in a letter dated April 22, 2009 (Appendix A).

The objectives of the investigation were to provide additional delineation of the lateral and vertical extent of soil and groundwater contamination and to determine the groundwater flow direction. The scope of work to accomplish these investigation objectives involved collecting soil samples from near the excavated area using hand tools (locations E, G and H), completing three borings (SB-1, SB-2 and SB-3), and installing, developing and sampling three groundwater monitoring wells (MW-1, MW-2 and MW-3).

## **SITE BACKGROUND**

### **Site Description**

The Federal Correctional Institution (FCI) is located approximately on 8<sup>th</sup> Street in the Camp Parks military reserve area of Dublin, California (Figure 1). The site is a correctional facility and has several onsite buildings associated with these operations. The site is largely unpaved, with asphalt roads and concrete sidewalks interwoven through the buildings. Land use surrounding the site is a mix of commercial, residential and reserve land utilized by the military. The site is located in a valley and local topography slopes gently to the south/southwest.

### **Release and Soil Excavation**

On April 25, 2008 during routine testing of the generator, the 3,000-gallon aboveground diesel storage tank that supplies fuel to the emergency backup generator system overflowed, releasing approximately 100 gallons of diesel fuel to the surrounding area (McElligot, 2008a). The tank is located near the southwest corner of the site and is housed in a concrete masonry unit (CMU) block building with a concrete slab on grade floor. The diesel fuel flowed into the CMU block building and through the door sill on the north side of the building and the ventilation opening on the west side. The flow then continued along the asphalt pathway, which is located to the northwest and southwest of the generator building, and into the unpaved “cold joints” located between the building foundation and the walkway. The fuel was absorbed into the underlying soil in these areas. The release extended out along the walkway located to the south of the



generator building and to the adjacent loading dock, absorbing through the pavement in these areas.

FCI Dublin personnel responded to the release within 30 minutes, shutting down the generator and fuel pump and applying absorbent material to the areas impacted by the released diesel fuel. It was reported that the flow switch on the emergency backup generator failed and the refill pump continued to pump the diesel fuel from the 3,000-gallon tank, causing the overflow.

MARCOR responded to the release the same day and removed diesel-impacted soil and asphalt from around the generator building to a depth of approximately four feet below ground surface (bgs), or until the limit of the buildings slab foundation was reached. MARCOR removed additional soil from the north and west sides of the generator building and a small amount from beneath the foundation on the north side in May 2008. A trenched area was left exposed along the north side of the generator building to allow for visual and olfactory inspection of the soil in this area. Diesel contamination was visible and fresh hydrocarbon odor was present in the trenched area and the area excavated beneath the building foundation

To initially characterize the hydrocarbon impact to the site subsurface, a soil and groundwater investigation was performed by MARCOR and Pangea on September 25, 2008, utilizing shallow sampling with hand tools and deeper sampling with direct-push drilling techniques. A total of twenty one (21) soil samples and three (3) grab groundwater samples were analyzed during this investigation. Select soil and groundwater samples were analyzed for Total Petroleum Hydrocarbons as Diesel (TPHd) by modified EPA Method 8015C; benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020 and EPA Method 8260B; and MTBE and naphthalene by EPA Method 8260B.

TPHd was detected at elevated concentrations. No naphthalene, benzene, or other compounds were detected in analyzed soil samples. The diesel (TPHd) impact to soil that exceeded the ESL of 83 milligrams per kilogram (mg/kg) was located primarily near the western corner of the generator building, where diesel product exited the building and was initially contained by the retaining wall and sorbent material. The highest TPHd concentrations were near or beneath the building at depths ranging from approximately 5 to 11 ft bgs, and the maximum detected TPHd concentration was 4,000 milligrams per kilogram (mg/kg) in sample B-2 from a depth of 10.5-11 ft bgs. The primary compound detected in site groundwater was TPHd, although lower concentrations of naphthalene and/or benzene were also detected in all three grab groundwater samples. The TPHd groundwater impact that exceeded the ESL for TPHd (100 µg/L) was located primarily near the western corner of the generator building.

## **INVESTIGATION ACTIVITIES**

On August 31 and September 1 & 2, 2009, Marcor and Pangea conducted shallow sampling using hand tools, sampled deeper soil and groundwater using direct-push drilling techniques, and installed three groundwater monitoring wells at the site. Soil sampling, boring and monitoring well locations are shown on Figure 2. A copy of the drilling permit is included in Appendix B. The sampling was conducted in general accordance with the approved *Soil and Groundwater Investigation Workplan with Preferential Pathway Evaluation*. A total of thirty-one (31) soil samples and two (2) grab groundwater samples were analyzed during this investigation. Additionally, three (3) groundwater samples were collected from the newly installed monitoring wells on September 17, 2009 after well development and purging.

Soil and groundwater samples were analyzed for total petroleum hydrocarbons as diesel (TPHd) by modified EPA Method 8015C with silica gel clean-up. Groundwater samples were additionally analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and naphthalene by EPA Method 8260B. Soil and groundwater samples were submitted for analysis to McCampbell Analytical, Inc., a California-certified laboratory. All samples were labeled, sealed in protective plastic bags, and stored on crushed ice at or below 4° C.

### **Shallow Sampling using Hand Tools**

Hand-auger borings were completed using a hand-held bucket auger to remove soil to the desired sampling depth. Samples were collected using a lined split-barrel sampler with slide hammer driven into undisturbed sediments beyond the bottom of the augered hole. The vertical location of each soil sample was determined using a tape measure.

Pangea collected soil samples at locations E, G and H as initially proposed in the *Preliminary Site Assessment Phase Workplan* prepared by McElligot Consulting and dated August 18, 2008. These samples were not collected during the September 2008 investigation due to time constraints and sampling difficulties.

The purpose of soil sample location E was to evaluate the extent of TPHd impact between location D (where elevated concentrations of TPHd were detected) and F (where no TPHd concentrations were detected). Consistent with the August 2008 Workplan, soil samples at location E were collected from the middle of the trench and from beneath the building and retaining wall foundations at approximately 5 to 6 ft bgs. The purpose of borings G and H was to evaluate the extent of contamination beneath the 2-to 3-inch depth excavation area. Additionally, boring G was used to evaluate potential contaminant migration along the 4-inch diameter sanitary sewer line and parallel water line. Although the Workplan indicated that samples would be collected at 0.5 and 1 ft depths, soil samples at location H were collected from approximately 2

and 3 ft depth (soil samples were not collected at shallower depths because the shallow soil consisted of gravel backfill in the vicinity of location H). Samples at location G were collected from approximately 0.5, 1, 3, 5 and 6 ft depth. To help control project cost, only select soil samples from certain locations were analyzed. Soil analytical data is summarized on Table 1.

### **Sampling using Hand Tools and Direct-Push Techniques**

The purpose of borings SB-1 and SB-2 was to further evaluate the extent of soil and/or groundwater contamination near the primary impact and release area. Boring SB-3 is located downhill from the primary impact area. Boring SB-3 was installed primarily to help determine if the groundwater impact detected in downgradient location I is the result of contaminant migration in groundwater from the upgradient spill source area, or if the hydrocarbons in groundwater at location I are the result of vertical contaminant migration through soil near the loading dock.

The drilling was observed in the field by Pangea Project Manager Morgan Gillies and supervised by Bob Clark-Riddell, a California Registered Professional Civil Engineer (P.E.). Soil characteristics such as color, texture, and relative water contents were noted in the field using the USCS classification system and entered onto a field boring log. Field screening of soil samples for potential hydrocarbons and volatile organic compounds included visual and olfactory observations and a photo-ionization detector (PID). Undisturbed soil samples were collected for laboratory analysis in acetate or brass liners, and capped with Teflon tape and plastic end caps. All samples were stored on ice and shipped under chain of custody to McCampbell Analytical, Inc., of Pittsburg, California, a California-certified laboratory.

Soil boring SB-2 was completed on August 31, 2009. Due to limited access, boring SB-2 was hand augered. Boring SB-2 could not be advanced past approximately 8 ft bgs due to the presence pea gravel at 8 ft bgs and collapsing of the boring walls. Field technicians collected a soil sample from above the pea gravel (5.5 to 6 ft bgs), as well as from approximately 8 ft bgs. Soil samples from boring SB-2 were collected using a brass sleeve lined split-barrel sampler driven into undisturbed soil with a slide-hammer.

Soil borings SB-1 and SB-3 were completed on September 2, 2009 and were hand augered to 4 ft bgs to avoid subsurface utilities. At proposed boring SB-1 a concrete slab was encountered at approximately 9.5 ft bgs, so the boring location was moved approximately 20 ft northeast. The concrete slab is assumed to be part of a former building foundation. Soil samples collected from boring SB-1 at depths of 8, 12 and 16 ft bgs were analyzed. Soil boring SB-3 was advanced to 20 ft bgs and soil samples were collected and analyzed from 8, 12 and 20 ft bgs. Additionally, groundwater samples were collected from temporary PVC casing installed in the open borehole at locations SB-1 and SB-3 (no water was encountered in shallower boring SB-2). Soil sampling

and boring locations are shown on Figure 3. Completed borings were tremmie-grouted from the bottom of the hole to the surface. Additional sampling procedures are described in Pangea's standard operating procedures in Appendix C.

### **Monitoring Well Installation**

Pangea installed three groundwater monitoring wells (MW-1 through MW-3) to help determine the groundwater flow direction and to further evaluate the lateral extent of groundwater contamination. The monitoring wells provide more representative groundwater samples than grab groundwater sampling and allow repeatable sampling. As shown on Figure 4, well MW-1 is located immediately downgradient of the primary impact area and adjacent to boring D-5, which contained the highest detected concentration of TPHd in grab groundwater during the September 2008 investigation. Well MW-2 is located south-southwest of the primary impact area, in the assumed downgradient direction. Well MW-3 is located south-southeast of the primary impact area and near the most southern extent of the spill/excavation at the loading dock. Additionally, MW-3 was installed to help evaluate the downgradient extent of groundwater impact and assess conditions between the source area and the former intermittent stream, where relatively higher soil permeability may be present within the former stream bed. The well locations also provide well triangulation to help estimate the groundwater flow direction.

To control cost, Pangea conducted the soil sampling and well installation with direct-push drilling techniques and collected soil samples during the well installation. Pangea analyzed select soil samples from each location to evaluate conditions in both vadose and saturated zone soil. Additional soil and assessment procedures are presented in our Standard Operating Procedures (Appendix C).

Pangea screened well MW-1 from approximately 20 to 25 ft bgs, well MW-2 from approximately 19.5 to 24.5 ft bgs, and well MW-3 from approximately 17 to 22 ft bgs, based on lithology. The wells were installed with a direct-push drill rig and are constructed of 1.0-inch Schedule 40 polyvinyl chloride (PVC) casing, pre-pack 0.01-inch factory-slotted PVC screen wrapped with #2-16 sand, with a bentonite seal and grout to the surface. Due to flowing sand encountered in the boreholes, the drillers were unable to place the well seal approximately 1 ft above the screen, as planned. The wells were constructed with bentonite seals at various depths as shown on the boring logs in Appendix D. The wells are protected by traffic-rated well vaults.

## **Well Surveying**

Pangea contracted Virgil Chavez Land Surveying of Vallejo, California to survey the monitoring wells for elevation and latitudinal and longitudinal position on September 28, 2009. The surveyor's report is included in Appendix E.

## **Well Development and Sampling**

Monitoring wells MW-1, MW-2 and MW-3 were developed on September 15, 2009. During development, the wells were intermittently surged with a surge block and groundwater was evacuated using a peristaltic pump until the water became clear. During purging, measurements of temperature, pH and conductivity were recorded on monitoring well development forms (Appendix F).

On September 17, 2009, the monitoring wells were gauged for depth-to-water and inspected for separate-phase hydrocarbons (SPH) prior to collection of groundwater samples. Well caps were removed from all monitoring wells and technicians allowed at least 15 minutes for water-level equilibration before measuring depth to water.

Groundwater samples were collected from all three site monitoring wells using a peristaltic pump and low-flow "micropurge" protocols on September 17, 2009. Purge volumes and measured field parameters are presented on the field data sheets in Appendix F. The Standard Operating Procedure used for sampling is presented in Appendix C. Groundwater samples were labeled, placed in protective plastic bags, and stored on crushed ice at or below 4° C. All samples were transported under chain-of-custody to the State-certified analytical laboratory. Purge water was stored on site in DOT-approved 55-gallon drums.

## **SITE INVESTIGATION RESULTS**

Soil and groundwater analytical data is summarized on Tables 1 and 2, respectively. Current and historical sample locations are shown on Figure 2. The groundwater elevation map and estimated flow direction is shown on Figure 3. The estimated primary extent of TPHd in soil and groundwater is illustrated on Figures 4 and 5, respectively. Soil lithology and groundwater depth (first encountered and static) is illustrated on the boring logs in Appendix D.

To determine the areas of primary concern regarding the subsurface impact, Pangea compared soil and groundwater concentrations to the Environmental Screening Levels (ESLs) for residential site use where groundwater is considered a current or potential source of drinking water. These ESLs seem appropriate since site groundwater is apparently used as a drinking water source and may be within a groundwater recharge area. The ESLs are conservative screening levels protective of human health and the environment, established by the Regional Water Quality Control Board – San Francisco Bay Region (RWQCB) in their November 2007 (revised May 2008) guidance document *Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater*. The soil and groundwater concentrations that exceed these ESLs are described below and highlighted in bold on the attached figures and tables.

### **Site Geology and Hydrogeology**

Soil encountered during site investigation generally consisted of a few feet of baserock and fill underlain by silty clay with a small percentage of fine-grain sand to a depth of approximately 16 to 20 ft bgs. Groundwater was generally encountered in a two to four ft thick sand unit found in most borings near approximately 20 ft bgs. This sand unit was underlain by more silty clay to the total explored depth of 28 ft bgs. Soil types are illustrated on the boring logs in Appendix D.

Based on depth-to-water measurements taken during well sampling, the depth to the potentiometric groundwater surface is approximately 12 to 15 ft bgs at the site. Based on soil lithology and analytical results presented below, the primary water-bearing materials appear to be the sand unit present at approximately 20 to 25 ft bgs. Given the overlying clayey soil and rising water during drilling, groundwater may be under semi-confined or confined conditions.

### **Groundwater Flow Direction**

Based on depth-to-water data collected on September 17, 2009, the overall groundwater flow direction is generally towards the *south-southeast* at a gradient of approximately 0.005 ft/ft. Groundwater elevation data and the inferred groundwater flow direction are shown on Figure 2. The inferred groundwater flow direction is generally consistent with local topography. Note that the inferred flow direction is heavily influenced by data from well MW-3 and the actual flow

direction may be more towards the southwest (the relocation of well MW-3 due to underground conduits resulted in less well triangulation). Depth-to-water and groundwater elevation data are presented in Table 2.

### **Soil Analytical Results**

The highest TPHd concentration detected in soil during this investigation was 2,400 milligrams per kilogram (mg/kg), from the boring for well MW-2 at a depth of 24.5-25 ft bgs. Elevated TPHd concentrations (>1,000 mg/kg) were also detected in the boring for well MW-1 at depths of approximately 23 and 25 ft bgs, and in sample E-1 (which was collected from the sidewall of the excavation beneath the generator building at approximately 5 ft bgs). No significant TPHd concentrations were detected in soil from boring G, near the 4-inch diameter sanitary sewer line and the parallel water line. The laboratory analytical report is included in Appendix G.

Soil analytical data from the current and prior investigations suggests that the primary impact area for shallow soil (<11 ft bgs) is near western corner of the generator building, where diesel product exited the building and was initially contained by the retaining wall and sorbent material (Figure 4). TPHd impact at the western corner of the generator building apparently moved vertically downward into deeper saturated soil (where groundwater is present) at 23 to 25 ft bgs, and then migrated laterally within the water-bearing sand unit in the southern, downgradient direction. This conclusion is based on limited TPHd detected in shallow soil at boring locations SB-3, MW-2 and MW-3, and more extensive impact at deeper sampling location at MW-2.

### **Groundwater Analytical Results**

No BTEX compounds were detected in analyzed groundwater samples, and naphthalene was only detected in well MW-1 (at a concentration of 36 µg/L).

The TPHd impact to groundwater is highest near the release area (generator building), where TPHd was detected at concentrations of 1,100 µg/L (well MW-1) and 2,000 µg/L (boring SB-3). TPHd concentrations are significantly lower in downgradient well MW-2 (230 µg/L) and boring I (410 µg/L). As shown on Figure 5, the TPHd groundwater impact that exceeds the ESL for TPHd (100 µg/L) extends from the generator building to the loading dock area. These results indicate that contaminant concentrations decrease with distance from the release/source area. The lack of detectable contaminant concentrations in well MW-3 suggests that the downgradient extent of contamination has been defined in the southern direction. Groundwater analytical results are summarized on Table 2 and the laboratory analytical report is included in Appendix G.

## CONCLUSIONS

Based on the above information, Pangea offers the following conclusions:

- The primary compound of concern is diesel fuel (TPHd), with elevated contaminant concentrations detected in site soil and groundwater. Lower concentrations of naphthalene and benzene have been detected above RWQCB Final ESLs in source area groundwater. However, benzene was only detected in one grab groundwater sample (7.7 µg/L) and was not detected in samples from the three groundwater monitoring wells. While naphthalene had been detected in two source area grab groundwater samples at a maximum concentration of 350 µg/L, naphthalene was only detected at 36 µg/L in source area well MW-1.
- Soil analytical data from the current and prior investigations suggests that the primary impact area for shallow soil (<11 ft bgs) is near western corner of the generator building, where diesel product exited the building and was initially contained by the retaining wall and sorbent material (Figure 4). TPHd impact at the western corner of the generator building apparently moved vertically downward into deeper saturated soil at 23 to 25 ft bgs, and then migrated laterally within the water-bearing sand unit in the southern, downgradient direction.
- TPHd concentrations in groundwater are also highest beneath the western edge of the generator building where the diesel fuel release exited the building. The groundwater impact is in the sand unit present at approximately 20 to 25 ft bgs. The significantly lower contaminant concentrations further from the release source area suggest that the groundwater contaminant is fairly limited in extent.
- The lack of contaminants detected in downgradient monitoring well MW-3 indicates that the lateral extent of contamination has been defined in the southern, downgradient direction. Data from well MW-3 also suggests that TPHd has not impacted the former intermittent stream east of the generator building, where relatively higher soil permeability may be present within the former stream bed that could act as a preferential pathway for contaminant migration.
- Future groundwater monitoring of the wells, required by ACEH directive letter dated April 22, 2009 for the first year, will help assess groundwater conditions over a full hydrogeologic cycle. Due to delay for project funding, the fourth quarter 2009 monitoring has not yet been performed. Pangea anticipates funding and well monitoring during the 1<sup>st</sup> quarter 2010. Despite missing the fourth quarter event, the 1<sup>st</sup> quarter 2010 monitoring (when water table elevations will likely be near the seasonal high) will allow comparison to the September 2009 monitoring results, when groundwater elevations were presumably near the seasonal low.



## **ATTACHMENTS**

Figure 1 – Vicinity Map

Figure 2 – Soil and Groundwater Sampling Location Map

Figure 3 – Groundwater Elevation and Hydrocarbon Concentration Map

Figure 4 – Soil Sample Location Map Showing Estimated Extent of TPHd in Soil

Figure 5 – Isoconcentration Map of TPHd in Groundwater

Table 1 – Soil Analytical Data

Table 2 – Groundwater Analytical Data

Appendix A – Regulatory Letter

Appendix B – Drilling Permit

Appendix C – Standard Field Operating Procedures

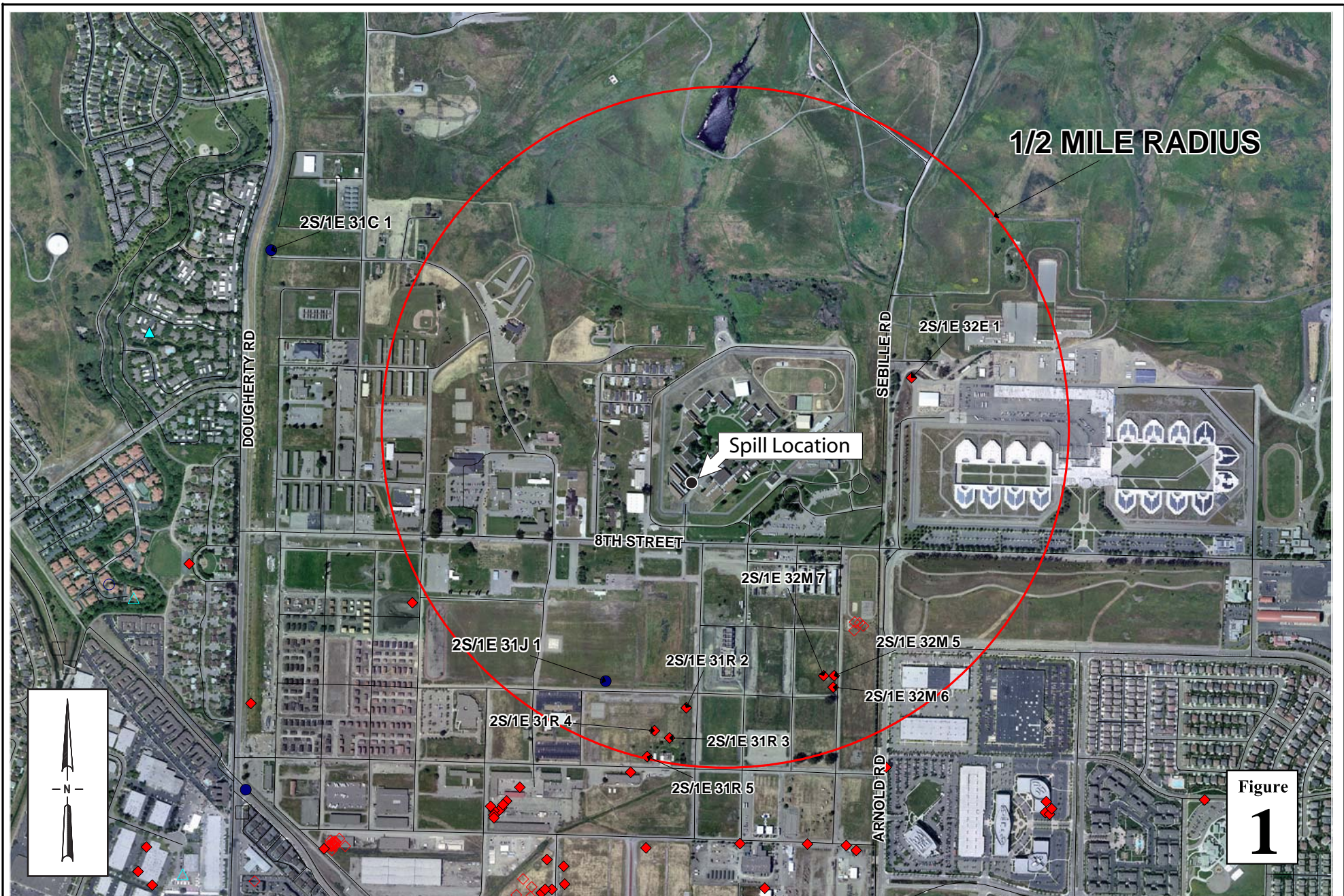
Appendix D – Boring Log

Appendix E – Surveyor's Report

Appendix F – Monitoring Well Field Data Sheets

Appendix G – Laboratory Analytical Reports





**ZONE 7 WATER AGENCY**  
 100 NORTH CANYONS PARKWAY  
 LIVERMORE, CA 94551

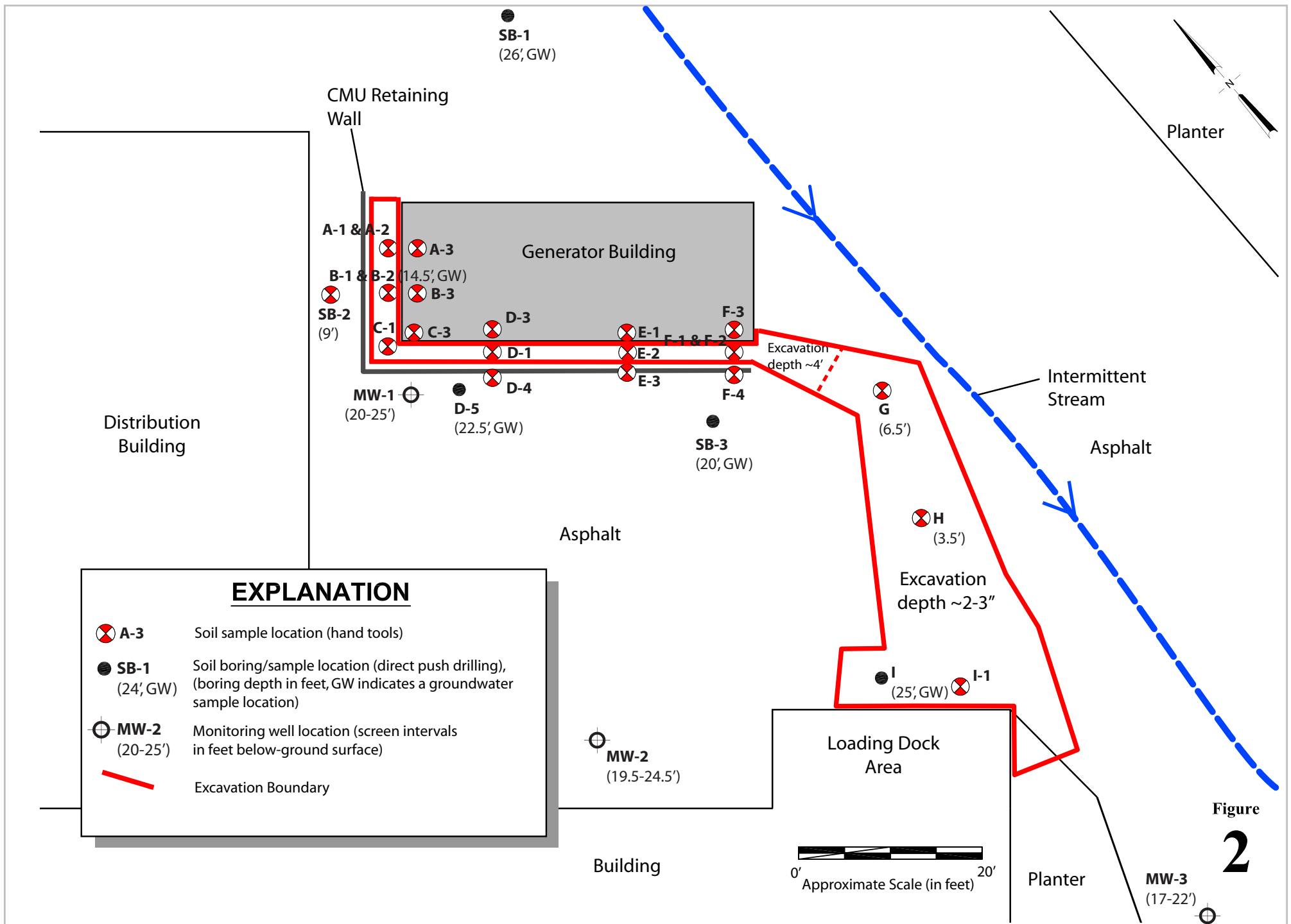
**WELL LOCATION MAP**

SCALE: 1" = 1000 ft

DATE: 2/26/09

5701 - 8TH ST. DUBLIN

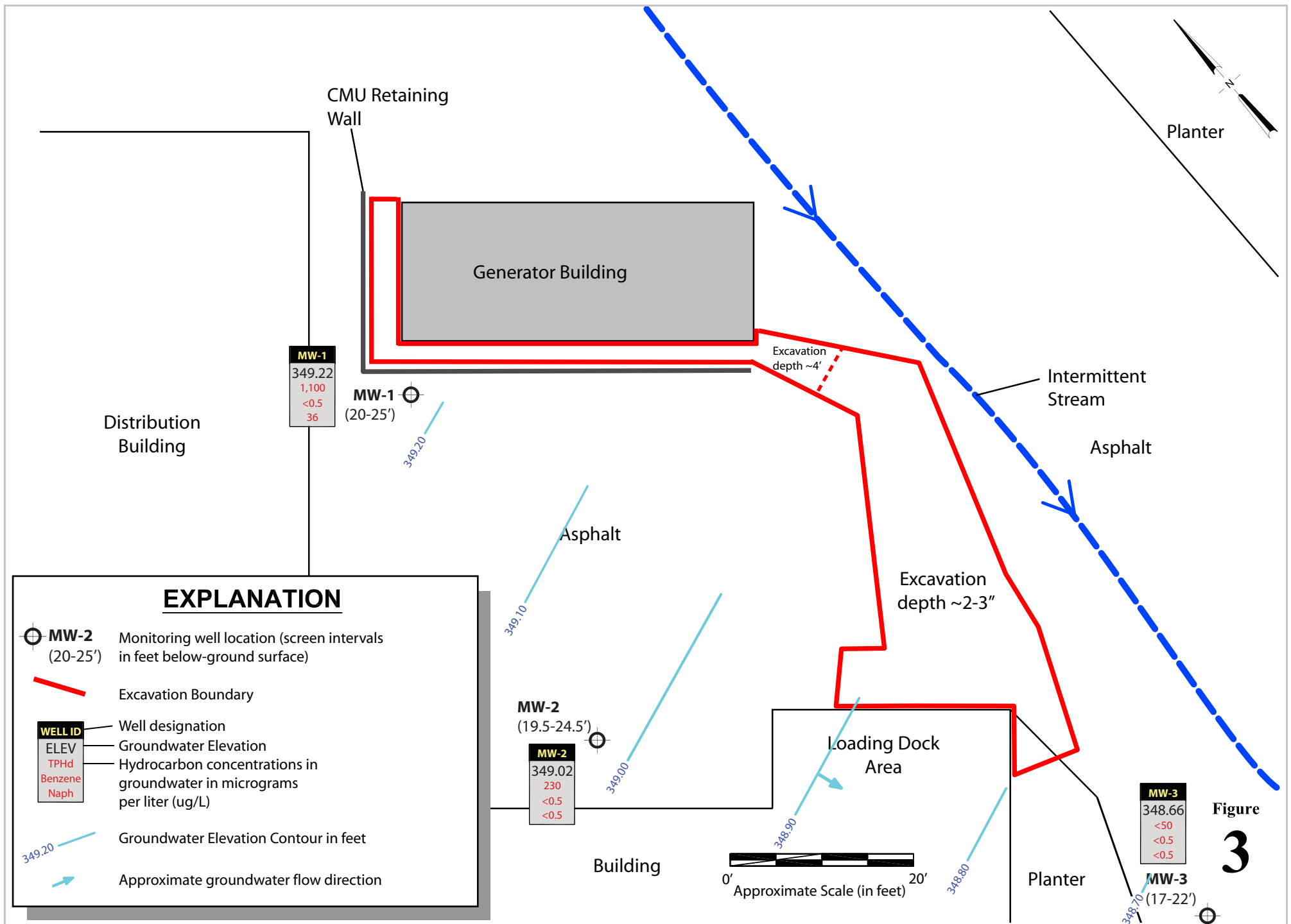




Dublin FCI  
 5701 8th Street  
 Dublin, California



Soil and Groundwater Sample  
 Location Map

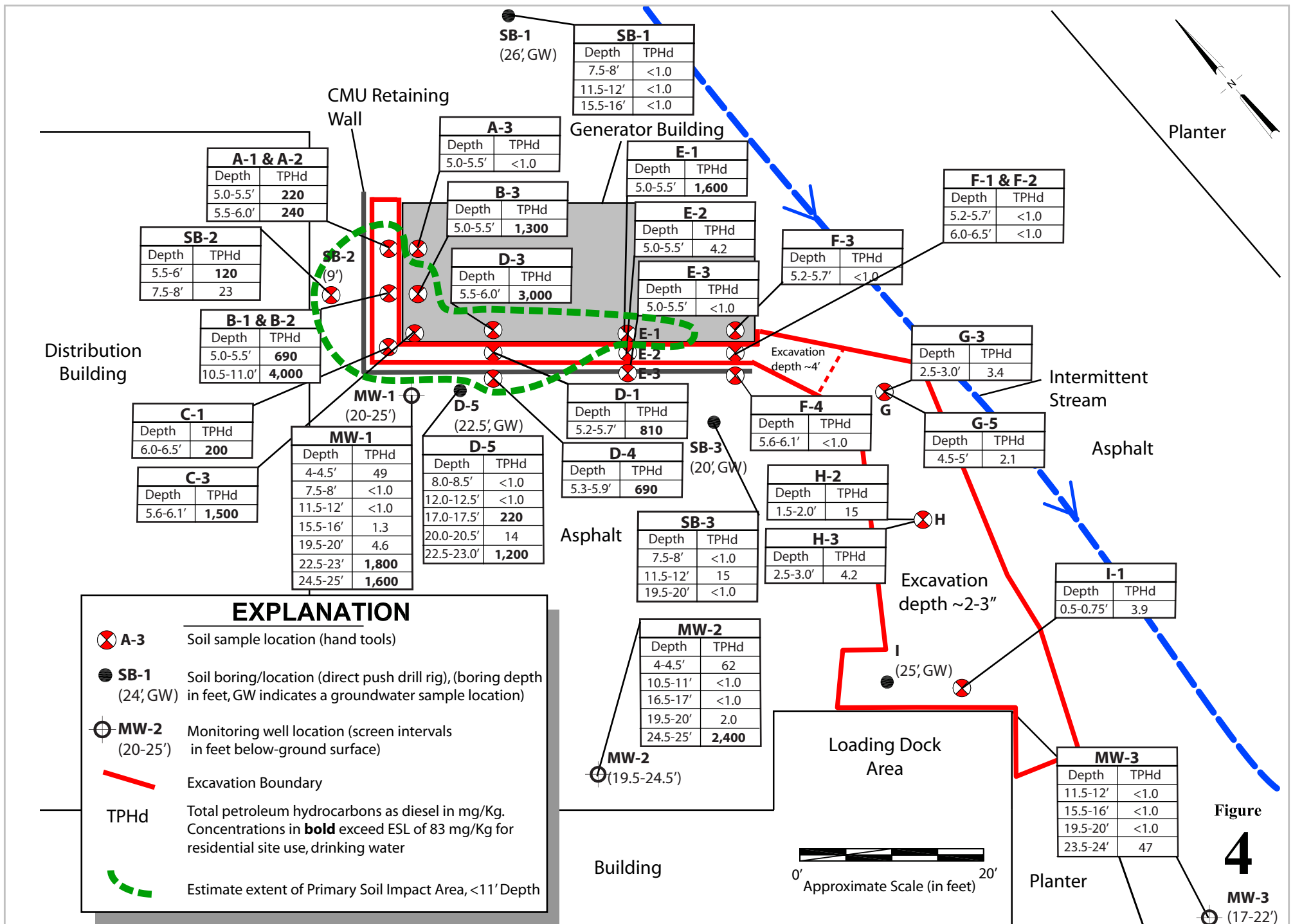


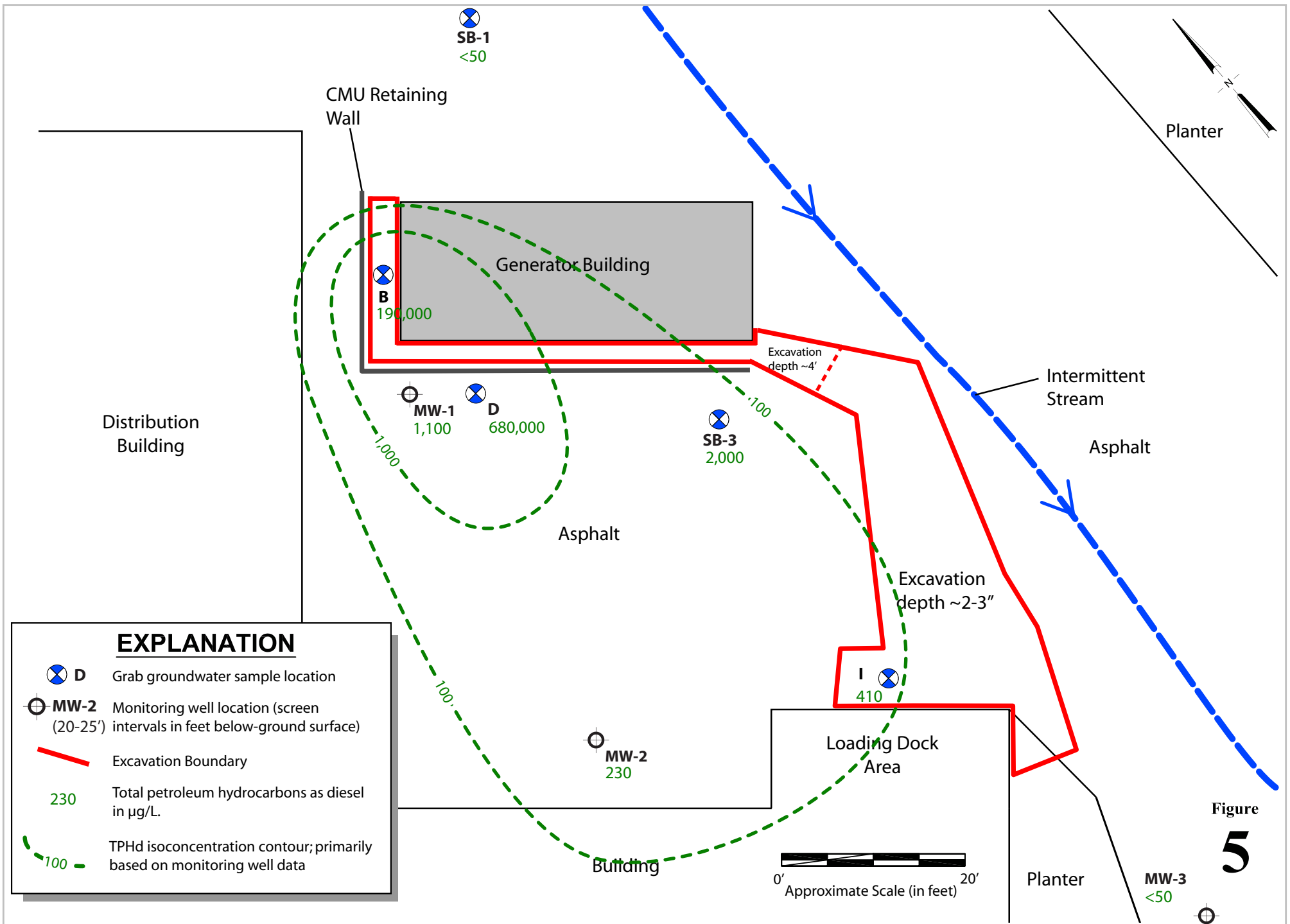
**Dublin FCI**  
**5701 8th Street**  
**Dublin, California**



**Groundwater Elevation and Hydrocarbon Concentration Map**

**Figure 3**

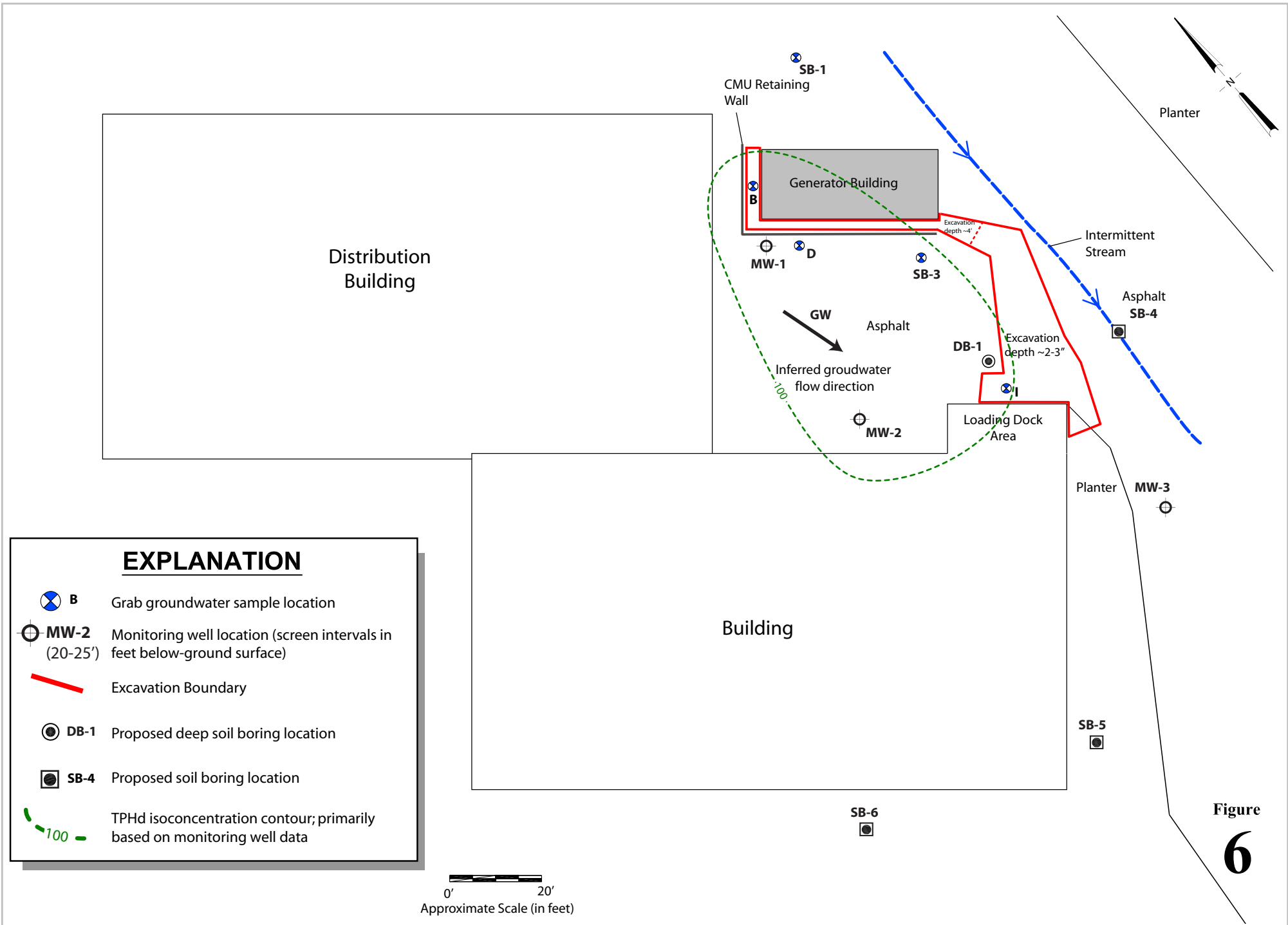




Dublin FCI  
 5701 8th Street  
 Dublin, California



Isoconcentration Map of TPHd  
 in Groundwater



Dublin FCI  
5701 8th Street  
Dublin, California



Proposed Boring Locations

# Pangea

**Table 1. Soil Analytical Data - Camp Parks Federal Correctional Institution, 5701 8th Street, Dublin, California**

Boring/ Sample ID	Date Sampled	Sample Depth Interval (feet bgs)	TPHd	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene
				← mg/kg →					
Gross Contamination on Ceiling Value			100	500	500	400	420	100	500
Urban Area Ecotoxicity Criteria			--	25	--	--	--	--	40
Direct Exposure			110	0.12	63	2.3	31	30	1.3
Protection (Soil Leaching)			83	0.044	2.9	3.3	2.3	0.023	3.4
Final ESL - Residential, Non-Drinking Water Resource			100	0.12	9.3	2.3	11	8.4	1.3
Final ESL - Residential, Drinking Water Resource			<b>83</b>	<b>0.044</b>	<b>2.9</b>	<b>2.3</b>	<b>2.3</b>	<b>0.023</b>	<b>1.3</b>

## SOIL INVESTIGATION - AUGUST/SEPTEMBER 2009

H-2	8/31/2009	1.5-2.0	15	--	--	--	--	--	--
H-3	8/31/2009	3.0-3.5	4.2	--	--	--	--	--	--
G-3	8/31/2009	3.0-3.5	3.4	--	--	--	--	--	--
G-5	8/31/2009	5.0-5.5	2.1	--	--	--	--	--	--
E-1*	8/31/2009	5.5-6.0	<b>1,600</b>	--	--	--	--	--	--
E-2*	8/31/2009	5.5-6.0	4.2	--	--	--	--	--	--
E-3*	8/31/2009	5.5-6.0	<1.0	--	--	--	--	--	--
SB-1-8	9/2/2009	7.5-8.0	<1.0	--	--	--	--	--	--
SB-1-12	9/2/2009	11.5-12.0	<1.0	--	--	--	--	--	--
SB-1-16	9/2/2009	15.5-16.0	<1.0	--	--	--	--	--	--
SB-2-6	8/31/2009	5.5-6.0	<b>120</b>	--	--	--	--	--	--
SB-2-8	8/31/2009	7.5-8.0	23	--	--	--	--	--	--
SB-3-8	9/2/2009	7.5-8.0	<1.0	--	--	--	--	--	--
SB-3-12	9/2/2009	11.5-12.0	15	--	--	--	--	--	--
SB-3-20	9/2/2009	19.5-20.0	<1.0	--	--	--	--	--	--
MW-1-4	9/1/2009	4.0-4.5	49	--	--	--	--	--	--
MW-1-8	9/1/2009	7.5-8.0	<1.0	--	--	--	--	--	--
MW-1-12	9/1/2009	11.5-12.0	<1.0	--	--	--	--	--	--
MW-1-16	9/1/2009	15.5-16.0	1.3	--	--	--	--	--	--
MW-1-20	9/1/2009	19.5-20.0	4.6	--	--	--	--	--	--
MW-1-23	9/1/2009	22.5-23.0	<b>1,800</b>	--	--	--	--	--	--
MW-1-25	9/1/2009	24.5-25.0	<b>1,600</b>	--	--	--	--	--	--
MW-2-4	9/1/2009	4.0-4.5	62	--	--	--	--	--	--
MW-2-11	9/1/2009	10.5-11.0	<1.0	--	--	--	--	--	--
MW-2-17	9/1/2009	16.5-17.0	<1.0	--	--	--	--	--	--
MW-2-20	9/1/2009	19.5-20.0	2.0	--	--	--	--	--	--
MW-2-25	9/1/2009	24.5-25.0	<b>2,400</b>	--	--	--	--	--	--
MW-3-12	9/1/2009	11.5-12.0	<1.0	--	--	--	--	--	--
MW-3-16	9/1/2009	15.5-16.0	<1.0	--	--	--	--	--	--
MW-3-20	9/1/2009	19.5-20.0	<1.0	--	--	--	--	--	--
MW-3-24	9/1/2009	23.5-24.0	47	--	--	--	--	--	--

## SOIL INVESTIGATION - SEPTEMBER 2008

A-1	9/25/2008	5.0-5.5	<b>220</b>	<0.005	<0.005	<0.005	<0.005	--	--
A-2	9/25/2008	5.5-6.0	<b>240</b>	--	--	--	--	--	--
A-3*	9/25/2008	5.0-5.5	<1.0	--	--	--	--	--	--
B-1	9/25/2008	5.0-5.5	<b>690</b>	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B-2	9/25/2008	10.5-11.0	<b>4,000</b>	--	--	--	--	--	--
B-3*	9/25/2008	5.0-5.5	<b>1,300</b>	--	--	--	--	--	--
C-1	9/25/2008	6.0-6.5	<b>200</b>	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
C-3*	9/25/2008	5.6-6.1	<b>1,500</b>	--	--	--	--	--	--
D-1	9/25/2008	5.2-5.7	<b>810</b>	<0.10	<0.10	<0.10	<0.10	--	--



# Pangea

**Table 1. Soil Analytical Data - Camp Parks Federal Correctional Institution, 5701 8th Street, Dublin, California**

Boring/ Sample ID	Date Sampled	Sample Depth Interval (feet bgs)	TPHd	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene
			← mg/kg →						
Gross Contamination on Ceiling Value			100	500	500	400	420	100	500
Urban Area Ecotoxicity Criteria			--	25	--	--	--	--	40
Direct Exposure			110	0.12	63	2.3	31	30	1.3
Protection (Soil Leaching)			83	0.044	2.9	3.3	2.3	0.023	3.4
Final ESL - Residential, Non-Drinking Water Resource			100	0.12	9.3	2.3	11	8.4	1.3
Final ESL - Residential, Drinking Water Resource			<b>83</b>	<b>0.044</b>	<b>2.9</b>	<b>2.3</b>	<b>2.3</b>	<b>0.023</b>	<b>1.3</b>
D-3*	9/25/2008	5.5-6.0	<b>3,000</b>	--	--	--	--	--	--
D-4*	9/25/2008	5.3-5.9	<b>690</b>	--	--	--	--	--	--
D-5	9/25/2008	8.0-8.5	<1.0	--	--	--	--	--	--
D-5	9/25/2008	12.0-12.5	<1.0	--	--	--	--	--	--
D-5	9/25/2008	17.0-17.5	<b>220</b>	--	--	--	--	--	--
D-5	9/25/2008	20.0-20.5	14	--	--	--	--	--	--
D-5	9/25/2008	22.5-23.0	<b>1,200</b>	--	--	--	--	--	--
F-1	9/25/2008	5.2-5.7	<1.0	<0.005	<0.005	<0.005	<0.005	--	--
F-2	9/25/2008	6.0-6.5	<1.0	--	--	--	--	--	--
F-3*	9/25/2008	5.2-5.7	<1.0	--	--	--	--	--	--
F-4*	9/25/2008	5.6-6.1	<1.0	--	--	--	--	--	--
I-1	9/25/2008	0.5-0.75	3.9	--	--	--	--	--	--

**Notes and abbreviations:**

mg/Kg = milligrams per Kilogram

ft bgs = Depth below ground surface (bgs) in feet.

< n = Chemical not present at a concentration in excess of detection limit shown.

ESL = Environmental Screening Level for Shallow Soil with Residential Land Use, Groundwater is/is not a current or potential source of drinking water. (Table A-1, Table B-1, Table H-2, Table K-1, Table E-1b and Table G).

ESL established by the SFBRWQCB, Interim Final - February 2005, and amended in November 2006 and May 2008.

**Bold** = Concentration above ESLs for Residential Land Use, potential drinking water resource

TPHd = Total Petroleum Hydrocarbons as diesel by EPA Method 8015C

Benzene, Toluene, Ethylbenzene and Xylenes by EPA Method 8021B

Naphthalene and MTBE by EPA Method 8260B

ND = Chemical not present in a concentration in excess of the reporting limit.

\* = Sample collected from the sidewall of the excavation

# Pangea

**Table 2. Groundwater Analytical Data - Camp Parks Federal Correctional Institution, 5701 8th Street, Dublin, California**

Sample/Well ID/TOC <i>Elevation</i>	Date <i>Sampled</i>	Depth to Water (ft)	Groundwater Elevation (ft, amsl)	Sample Depth/ Screening Interval (ft, bgs)	TPHd	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene
					←————— ug/L —————→						
Ceiling Value (Taste, Odors, etc.)					100	170	40	30	20	5.0	21
Drinking Water (Toxicity)					210	1.0	150	300	1,800	13	17
Vapor Intrusion Into Buildings					84	540	380,000	170,000	160,000	24,000	3,200
Aquatic Habitat Goal (Chronic)					210	46	130	43	100	8,000	24
Final Groundwater ESL - Residential, Non- Drinking Water Resource					210	46	130	43	100	1,800	24
Final Groundwater ESL - Residential, Drinking Water Resource					<b>100</b>	<b>1.0</b>	<b>40</b>	<b>30</b>	<b>20</b>	<b>5.0</b>	<b>17</b>

**MONITORING WELL SAMPLES - SEPTEMBER 2009**

MW-1 364.12	9/17/2009	14.90	349.22	20-25	<b>1,100</b>	<0.5	<0.5	<0.5	<0.5	--	<b>36</b>
MW-2 363.66	9/17/2009	14.64	349.02	19.5-24.5	<b>230</b>	<0.5	<0.5	<0.5	<0.5	--	<0.5
MW-3 361.18	9/17/2009	12.52	348.66	17-22	<50	<0.5	<0.5	<0.5	<0.5	--	<0.5

**GRAB GROUNDWATER SAMPLING - AUGUST/SEPTEMBER 2009**

SB-1	9/2/2009	--	--	21-26	<50	<0.5	<0.5	<0.5	<0.5	--	<0.5
SB-3	9/2/2009	--	--	15-20	<b>2,000</b>	<0.5	<0.5	<0.5	<0.5	--	<b>36</b>

**GRAB GROUNDWATER SAMPLING - SEPTEMBER 2008**

B-gw*	9/25/2008	--	--	14.5	<b>190,000</b>	<b>7.7</b>	<5.0	<5.0	<5.0	<5.0	<b>350</b>
D-gw	9/25/2008	--	--	19.5-22.5	<b>680,000</b>	<5.0	<5.0	<5.0	<5.0	<5.0	<b>260</b>
I-gw	9/25/2008	--	--	20-25	<b>410</b>	<0.5	<0.5	<0.5	<0.5	1.0	2.1

ug/L = micrograms per liter

ft bgs = Depth below ground surface (bgs) in feet.

< n = Chemical not present at a concentration in excess of detection limit shown.

ESL = Environmental Screening Levels for groundwater where groundwater is a current or potential drinking water resource from Table F-1a, established by the SFBRWQCB, Interim Final - November 2007 (Revised May 2008).

**Bold** = Concentration above final ESL.

TPHd = Total Petroleum Hydrocarbons as diesel by EPA Method 8015C

Benzene, Toluene, Ethylbenzene and Xylenes by EPA Method 8021B

Naphthalene and MTBE by EPA Method 8260B

\* = Groundwater sample was collected by lowering a disposable bailer into the open borehole.

## **APPENDIX A**

### **Regulatory Letter**



ENVIRONMENTAL HEALTH SERVICES  
ENVIRONMENTAL PROTECTION  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577  
(510) 567-6700  
FAX (510) 337-9335

April 22, 2009

Mr. Armando Ledezma  
Federal Corrections Institution Dublin  
5701 8<sup>th</sup> Street  
Dublin, CA 94568

Subject: SLIC Case No. RO0002977 and GeoTracker Global ID SLT19749067, FCI Dublin,  
5701 8<sup>th</sup> Street, Dublin, CA 94568

Dear Mr. Ledezma:

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the above-referenced site including the recently submitted document entitled, "Soil and Groundwater Investigation Work Plan with Preferential Pathway Evaluation," dated March 31, 2009, which was prepared by PANGEA Environmental Services, Inc. (PANGEA) for the subject site. PANGEA conducted a preferential pathway evaluation and well survey at the site and determined that "all identified subsurface utilities near the spill location are significantly shallower than site groundwater and do not likely act as preferential pathways for contaminated groundwater migration. However, the surface spill could have migrated preferentially within site soil via the subsurface utility trenches." To address the identified data gaps, PANGEA proposes to collect three soil samples (locations E, G, and H) previously proposed by McElligot Consulting, install three borings (SB-1 through SB-3) to collect soil and groundwater samples from SB-1 and SB-3 and soil samples from SB-2, and install three pre-packed groundwater monitoring wells to assess the extent and magnitude of the groundwater contaminant plume.

ACEH generally concurs with the proposed scope of work and requests that you note the following technical comments, perform the proposed work, and send us the technical reports described below.

#### **TECHNICAL COMMENTS**

1. **Pre-packed Groundwater Monitoring Wells** – As a cost savings measure, PANGEA proposes to install three pre-packed groundwater monitoring wells. ACEH does not object to pre-packed monitoring well installations. However, pre-packed monitoring wells have been reported to be problematic to pressure grout at time of monitoring well decommissioning for case closure. Therefore, ACEH recommends consulting with Zone 7 Water Agency prior to installation. Should over-drilling monitoring wells be required, the cost of well decommissioning may be increased over pressure grouting monitoring wells.

### **NOTIFICATION OF FIELDWORK ACTIVITIES**

Please schedule and complete the fieldwork activities by the date specified below and provide ACEH with at least three (3) business days notification prior to conducting the fieldwork.

### **TECHNICAL REPORT REQUEST**

Please submit technical reports to ACEH (Attention: Paresh Khatri), according to the following schedule:

- **June 23, 2009** – Soil and Water Investigation Report
- **Due within 30 Days of Sampling** – Quarterly Monitoring Report (2<sup>nd</sup> Quarter 2009)
- **Due within 30 Days of Sampling** – Quarterly Monitoring Report (3<sup>rd</sup> Quarter 2009)
- **Due within 30 Days of Sampling** – Quarterly Monitoring Report (4<sup>th</sup> Quarter 2009)
- **Due within 30 Days of Sampling** – Quarterly Monitoring Report (1<sup>st</sup> Quarter 2010)

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

### **ELECTRONIC SUBMITTAL OF REPORTS**

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements ([http://www.swrcb.ca.gov/ust/electronic\\_submittal/report\\_rqmts.shtml](http://www.swrcb.ca.gov/ust/electronic_submittal/report_rqmts.shtml)).



PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

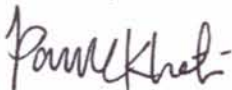
Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

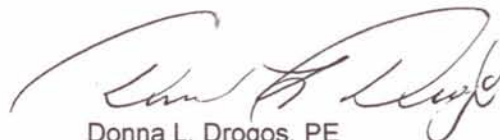
If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to \$10,000 per day for each day of violation.

If you have any questions, please call me at (510) 777-2478 or send me an electronic mail message at [pareskhatri@acgov.org](mailto:pareskhatri@acgov.org).

Sincerely,



Paresh C. Khatri  
Hazardous Materials Specialist



Donna L. Drogos, PE  
Supervising Hazardous Materials Specialist

Mr. Ledezma  
RO0002977  
April 24, 2009, Page 4

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Noah Ceteras, Marcor Remediation, Inc., 6644 Sierra Lane, Dublin, CA 94568  
Bob Clark-Riddell, Pangea Environmental Services, Inc., 1710 Franklin Street, Suite 200,  
Oakland, CA 94612  
Cheryl Dizon (QIC 8021), Zone 7 Water Agency, 100 North Canyons Pkwy, Livermore, CA 94551  
Donna Drogos, ACEH  
Paresh Khatri, ACEH  
GeoTracker  
File

## **APPENDIX B**

### **Drilling Permit**





# ZONE 7 WATER AGENCY

100 NORTH CANYONS PARKWAY, LIVERMORE, CALIFORNIA 94551 VOICE (925) 454-5000 FAX (925) 245-9306  
E-MAIL [whong@zone7water.com](mailto:whong@zone7water.com)

## DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT FCI Dublin  
5701 8th St - Camp Parks  
Dublin

Coordinates Source \_\_\_\_\_ ft. Accuracy \_\_\_\_\_ ft.  
LAT: \_\_\_\_\_ ft. LONG: \_\_\_\_\_ ft.  
APN \_\_\_\_\_

CLIENT  
Name FCI - Dublin, Armando Ledezma  
Address 5701 8th St - Camp Parks Phone (925) 833-7519  
City Dublin Zip 94568

APPLICANT  
Name Panacea Env. Services, Morgan Gillies  
Email mgillies@panaceaenv.com Fax (510) 836-3709  
Address 1710 Franklin St, Suite 200 Phone (408) 910-1783  
City Oakland Zip 94612

TYPE OF PROJECT:  
 Well Construction 9  Geotechnical Investigation 9  
 Well Destruction 9  Contamination Investigation 9  
 Cathodic Protection 9  Other \_\_\_\_\_ 9

PROPOSED WELL USE:  
Domestic 9  Irrigation 9  
Municipal 9  Remediation 9  
Industrial 9  Groundwater Monitoring 9  
Dewatering 9  Other \_\_\_\_\_ 9

DRILLING METHOD:  
Mud Rotary 9  Air Rotary 9  Hollow Stem Auger 9  
Cable Tool 9  Direct Push 9  Other \_\_\_\_\_ 9

DRILLING COMPANY RSE Drilling, Inc

DRILLER'S LICENSE NO. 802334

WELL SPECIFICATIONS: MW-1 through MW-3  
Drill Hole Diameter 3.25 in. Maximum  
Casing Diameter 1 in. Depth 25 ft.  
Surface Seal Depth 19 ft. Number 3

SOIL BORINGS: SB-1 through SB-3  
Number of Borings 3 Maximum  
Hole Diameter 3.25 in. Depth 25 ft.

ESTIMATED STARTING DATE 9/1/09  
ESTIMATED COMPLETION DATE 9/3/09

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [Signature] Date 8/4/09

ATTACH SITE PLAN OR SKETCH

PERMIT NUMBER 29057  
WELL NUMBER 2S/1E-31H1 to 31H3 (MW-1 to MW-3)  
APN \_\_\_\_\_

PERMIT CONDITIONS  
(Circled Permit Requirements Apply)

- A. GENERAL**
  1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to your proposed starting date.
  2. Submit to Zone 7 within 60 days after completion of permitted work the original **Department of Water Resources Water Well Drillers Report (DWR Form 188), signed by the driller.**
  3. Permit is void if project not begun within 90 days of approval date.
- B. WATER SUPPLY WELLS**
  1. Minimum surface seal diameter is four inches greater than the well casing diameter.
  2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.
  3. Grout placed by tremie.
  4. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
  5. A sample port is required on the discharge pipe near the wellhead.
- C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS**
  1. Minimum surface seal diameter is four inches greater than the well or piezometer casing diameter.
  2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
  3. Grout placed by tremie.
- D. GEOTECHNICAL.** Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.
- E. CATHODIC.** Fill hole above anode zone with concrete placed by tremie.
- F. WELL DESTRUCTION.** See attached.
- G. SPECIAL CONDITIONS.** Submit to Zone 7 within 60 days after completion of permitted work the well installation report **including all soil and water laboratory analysis results.**

Approved [Signature] Date 8/18/09  
Wyman Hong

## **APPENDIX C**

### **Standard Field Operating Procedures**

## **STANDARD FIELD PROCEDURES FOR MONITORING WELLS**

This document describes Pangea Environmental Services' standard field methods for drilling, installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

### **Well Construction and Surveying**

Groundwater monitoring wells are installed in soil borings to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I, II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security. The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

### **Well Development**

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. Wells may be surged prior to installation of the well seal to ensure that there are no voids in the sand pack. Development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

### **Groundwater Sampling**

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

## STANDARD FIELD PROCEDURES FOR SOIL BORINGS

This document describes Pangea Environmental Services' standard field methods for drilling and sampling soil borings. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

### Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality, and to submit samples for chemical analysis.

### Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist, scientist or engineer working under the supervision of a California Registered Engineer, California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e. sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or product saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e. cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

### Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic-push technologies. At least one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples are collected near the water table and at lithologic changes. With hollow-stem drilling, samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments beyond the bottom of the borehole. With hydraulic-push drilling, samples are typically collected using acetate liners. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

### Sample Storage, Handling and Transport

Sampling tubes or cut acetate liners chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

## **Field Screening**

Soil samples collected during drilling will be analyzed in the field for ionizable organic compounds using a photo-ionization detector (PID) with a 10.2 eV lamp. The screening procedure will involve placing an undisturbed soil sample in a sealed container (either a zip-lock bag, glass jar, or a capped soil tube). The container will be set aside, preferably in the sun or warm location. After approximately fifteen minutes, the head space within the container will be tested for total organic vapor, measured in parts per million on a volume to volume basis (ppmv) by the PID. The PID instrument will be calibrated prior to boring using hexane or isobutylene. PID measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

## **Water Sampling**

Water samples collected from borings are either collected from the open borehole, from within screened PVC inserted into the borehole, or from a driven Hydropunch-type sampler. Groundwater is typically extracted using a bailer, check valve and/or a peristaltic pump. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory.

Pangea often performs electrical conductivity (EC) logging and/or continuous coring to identify potential water-bearing zones. Hydropunch-type sampling is then performed to provide discrete-depth grab groundwater sampling within potential water-bearing zones for vertical contaminant delineation. Hydropunch-type sampling typically involves driving a cylindrical sheath of hardened steel with an expendable drive point to the desired depth within undisturbed soil. The sheath is retracted to expose a stainless steel or PVC screen that is sealed inside the sheath with Neoprene O-rings to prevent infiltration of formation fluids until the desired depth is attained. The groundwater is extracted using tubing inserted down the center of the rods into the screened sampler.

## **Duplicates and Blanks**

Blind duplicate water samples are usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory QA/QC blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

## **Grouting**

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

## **Waste Handling and Disposal**

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55 gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

# **STANDARD OPERATING PROCEDURE FOR “MICROPURGE” LOW FLOW GROUNDWATER SAMPLING**

## **1.0 PURPOSE**

This standard operating procedure (SOP) describes the procedures for conducting “micropurge” low flow groundwater sampling. This SOP is based on Puls and Barcelona, 1996.

## **2.0 EQUIPMENT**

- Low-flow purging/sampling pump. Equipment to be used may include (in decreasing order of preference): dedicated bladder or Grundfos Rediflo pump, peristaltic pump (shallow water table only), non-dedicated bladder or Grundfos Rediflo pump
- pH meter
- EC meter
- Digital thermometer
- Flow-through cell and DO meter (optional, depending on site requirements)
- Sample vials and preservatives appropriate for analytical methods
- Sample labels
- Cooler with bagged ice
- Record-keeping materials
- Latex or nitrile gloves

## **3.0 WATER LEVEL MEASUREMENTS**

1. Remove all well caps. Do NOT sound the total depth of the wells until after completion of sampling (this step may stir up sediment).
2. Allow each well to equilibrate to atmospheric pressure for at least 30 minutes (this step is not necessary for stovepipe wells with vented casings).
3. During equilibration, take water levels at approximately 10-minute intervals to assess the water level stability. Note changes and stability of the water level. Allow additional time for equilibration at any wells that do not exhibit stable readings over a 10-minute interval.
4. Record final water level after water level has stabilized.

## **4.0 EQUIPMENT CALIBRATION**

Calibrate all meters according to manufacturer’s instructions prior to sampling. Record calibration in field notes.

## 5.0 WELL PURGING

The validity of the micropurging method is based on strict adherence to the following purging and sampling requirements:

- Mixing of the water column within the well prior to and during purging and sampling is minimized by not inserting pumps and bailers into the well (or minimizing insertion).
  - The pump intake (or suction tubing) for both purging and sampling is positioned at the target sampling depth within the water column, and not so deep as to agitate sediment near the bottom of the well.
  - Drawdown within the well is minimized by pumping at low rates (typically 0.1 to 0.5 liters per minute [0.025 to 0.125 gpm]).
  - Purge volume is determined by the stabilization of indicator parameters (primarily electric conductivity [EC], pH and dissolved oxygen [DO] or turbidity) within specific criteria.
1. **Pump Insertion.** If a dedicated pump is installed in the well, take care not to move the pump up or down within the water column. If no dedicated pump is present, lower the pump or peristaltic suction tube **slowly** to the specific sampling depth required (generally within the upper half of the screened section) and secure. Do not allow the pump to drop into the bottom half of the water column.
  2. **Purging.** Initiate purging at a rate no greater than 0.5 liters per minute [0.125 gpm]. Monitor the water level during purging and reduce the flow rate if the drawdown below static water level approaches 0.3 feet. The objective is to not exceed 0.33 feet of drawdown during purging. Periodically record water depth and volume measurements.
  3. **Stabilization.** At a minimum, monitor EC, pH, and either DO or turbidity, preferably using a flow-through cell. ORP may also be monitored. Stabilization has been reached when three successive readings taken 3 to 5 minutes apart are within the following tolerances for ALL parameters (EC  $\pm 3\%$ , pH  $\pm 0.1$ , DO or turbidity  $\pm 10\%$ , ORP  $\pm 10\text{mv}$ ).
  4. **Sampling.** Sampling should be conducted as soon as stabilization has been reached or a maximum purge volume of 3 casing volumes for a 4" well, or 5 casing volumes for a 2" well has been reached. Collect samples by disconnecting the flow-through cell and directing the pump tubing outlet flow directly into the sample containers.
  5. **Shipment.** Place samples in a cooler with bagged ice and ship under chain-of-custody to the project laboratory.

## REFERENCE

Puls, R.W. and Barcelona, M.J., 1996, Low-flow (minimal drawdown) ground-water monitoring procedures, U.S. Environmental Protection Agency Superfund Technology Support Center for Ground Water, National Risk Management Research Laboratory, Subsurface Protection and Remediation Division, EPA/540/S-95/504, April.

## **APPENDIX D**

### **Boring Logs**





Pangea Environmental Services, Inc.  
 1710 Franklin Street Suite 200  
 Oakland, CA 94612

# BORING NUMBER G

PAGE 1 OF 1

<b>CLIENT</b> <u>Marcor</u>	<b>PROJECT NAME</b> <u>FCI - Dublin</u>
<b>PROJECT NUMBER</b> <u>1320.001</u>	<b>PROJECT LOCATION</b> <u>5701 8th Street</u>
<b>DATE STARTED</b> <u>8/31/09</u>	<b>COMPLETED</b> <u>8/31/09</u>
<b>DRILLING CONTRACTOR</b> _____	<b>GROUND ELEVATION</b> _____
<b>DRILLING METHOD</b> <u>Hand Auger</u>	<b>HOLE SIZE</b> <u>3.25"</u>
<b>LOGGED BY</b> <u>Morgan Gillies</u>	<b>CHECKED BY</b> <u>Bob Clark-Riddell</u>
<b>NOTES</b> _____	<b>GROUND WATER LEVELS:</b>
	<b>AT TIME OF DRILLING</b> <u>---</u>
	<b>AT END OF DRILLING</b> <u>---</u>
	<b>AFTER DRILLING</b> <u>---</u>

DEPTH (ft bgs)	SAMPLE TYPE NUMBER	PID (ppm)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BORING DIAGRAM
0						
			GP		0.5 <b>Gravel (GP)</b> ; grey; 100% coarse gravel to 3".	<p>Portland Cement</p>
	G-1.5		GM		<b>Silty Gravel (GM)</b> ; grey; 70-80% fine to coarse gravel to 2"; 20-30% low plasticity fines; dry.	
	G-3		CL		<b>Gravelly Clay (CL)</b> ; black and brown; 70-80% medium plasticity fines; 20-30% fine to coarse gravel to 2"; moist.	
5					@4.5' Slight hydrocarbon odor.	
	G-5	4	SP		<b>Sand (SP)</b> ; brown; 100% fine- to medium-grain sand; moist.	
	G-6		CL		<b>Sandy Clay (CL)</b> ; black and brown; 70-80% medium plasticity fines; 10-20% fine- to coarse-grain sand; 5-10% fine to coarse gravel to 1".	
					Bottom of hole at 6.5 feet.	



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 Oakland, CA 94612

# BORING NUMBER SB-1

PAGE 1 OF 2

<b>CLIENT</b> <u>Marcor</u>	<b>PROJECT NAME</b> <u>FCI - Dublin</u>
<b>PROJECT NUMBER</b> <u>1320.001</u>	<b>PROJECT LOCATION</b> <u>5701 8th Street</u>
<b>DATE STARTED</b> <u>9/2/09</u> <b>COMPLETED</b> <u>9/2/09</u>	<b>GROUND ELEVATION</b> _____ <b>HOLE SIZE</b> <u>2.75"</u>
<b>DRILLING CONTRACTOR</b> <u>RSI</u>	<b>GROUND WATER LEVELS:</b>
<b>DRILLING METHOD</b> <u>Direct Push - Dual Tube</u>	▽ <b>AT TIME OF DRILLING</b> <u>17.0 ft</u>
<b>LOGGED BY</b> <u>Morgan Gillies</u> <b>CHECKED BY</b> <u>Bob Clark-Riddell</u>	<b>AT END OF DRILLING</b> <u>---</u>
<b>NOTES</b> <u>Hand auger to 4'.</u>	▽ <b>.5hrs AFTER DRILLING</b> <u>12.2 ft</u>

DEPTH (ft bgs)	SAMPLE TYPE NUMBER	PID (ppm)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BORING DIAGRAM
0						
0.5					<b>Asphalt.</b>	
					<b>Silty Clay (CL);</b> black; 95-100% medium to high plasticity fines; trace-5% fine-grain sand; moist.	
5					@4' Brown.	
	SB-1-8	1	CL			
	SB-1-12	1			▽	
15						
	SB-1-16	1				
					17.0 ▽	
			SM		17.5 <b>Silty Sand (SM);</b> light brown; 60-70% fine-grain sand; 30-40% low plasticity fines; wet.	
			CL		<b>Silty Clay (CL);</b> light brown; 95-100% medium plasticity fines; trace-5% fine-grain sand; moist.	
	SB-1-19	1				
20					19.5	
			SM		20.0 <b>Silty Sand (SM);</b> light brown; 60-70% fine-grain sand; 30-40% low plasticity fines; wet.	

Portland Cement

BH COPY FCI DUBLIN SB-1.GPJ GINT US.GDT 12/3/09

(Continued Next Page)



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# BORING NUMBER SB-1

CLIENT Marcor PROJECT NAME FCI - Dublin  
 PROJECT NUMBER 1320.001 PROJECT LOCATION 5701 8th Street

DEPTH (ft bgs)	SAMPLE TYPE NUMBER	PID (ppm)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BORING DIAGRAM
20						
			CL		plasticity fines; moist. <b>Silty Clay (CL)</b> ; light brown; 95-100% medium plasticity fines; trace-5% fine-grain sand; moist.	
	SB-1-22	1	SP		21.5 22.0 <b>Sand (SP)</b> ; light brown; 100% medium to fine-grain sand; moist.	
	SB-1-24		CL		<b>Silty Clay (CL)</b> ; light brown; 95-100% medium plasticity fines; trace-5% fine-grain sand; moist.	
25			SP		24.5 26.0 <b>Sand (SP)</b> ; light brown; 95-100% fine- to medium-grain sand; trace-5% fine gravel; wet.	
					(Installed temporary PVC casing with 5' 0.010" slotted screen at the bottom. Approximately 1/4 gallon of groundwater was purged and a sample was collected with a peristaltic pump and new tubing.) Bottom of hole at 26.0 feet.	



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 Oakland, CA 94612

# BORING NUMBER SB-2

CLIENT Marcor PROJECT NAME FCI - Dublin  
 PROJECT NUMBER 1320.001 PROJECT LOCATION 5701 8th Street  
 DATE STARTED 8/31/09 COMPLETED 8/31/09 GROUND ELEVATION \_\_\_\_\_ HOLE SIZE 3.25"  
 DRILLING CONTRACTOR \_\_\_\_\_ GROUND WATER LEVELS:  
 DRILLING METHOD Hand Auger AT TIME OF DRILLING ---  
 LOGGED BY Morgan Gillies CHECKED BY Bob Clark-Riddell AT END OF DRILLING ---  
 NOTES \_\_\_\_\_ AFTER DRILLING ---

DEPTH (ft bgs)	SAMPLE TYPE NUMBER	PID (ppm)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BORING DIAGRAM
0						
5	SB-2-6		CL		<p><b>Silty Clay (CL)</b>; brown; 90-100% medium plasticity fines; trace-5% fine-grain sand; trace-5% fine gravel to 3/4"; dry.</p> <p>@5' Moist; black.</p> <p>@6' Hydrocarbon odor.</p>	
8.0	SB-2-8	15	GP		<p><b>Sandy Gravel (Pea Gravel) (GP)</b>; grey; 80-90% fine gravel to 1/2"; 10-20% fine- to coarse-grain sand; loose.</p> <p>@9' Pea gravel keeps filling in borehole. Bottom of hole at 9.0 feet.</p>	
9.0						



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# BORING NUMBER SB-3

<b>CLIENT</b> <u>Marcor</u>	<b>PROJECT NAME</b> <u>FCI - Dublin</u>
<b>PROJECT NUMBER</b> <u>1320.001</u>	<b>PROJECT LOCATION</b> <u>5701 8th Street</u>
<b>DATE STARTED</b> <u>9/2/09</u> <b>COMPLETED</b> <u>9/2/09</u>	<b>GROUND ELEVATION</b> _____ <b>HOLE SIZE</b> <u>2.75"</u>
<b>DRILLING CONTRACTOR</b> <u>RSI</u>	<b>GROUND WATER LEVELS:</b>
<b>DRILLING METHOD</b> <u>Direct Push - Dual Tube</u>	▽ <b>AT TIME OF DRILLING</b> <u>16.0 ft</u>
<b>LOGGED BY</b> <u>Morgan Gillies</u> <b>CHECKED BY</b> <u>Bob Clark-Riddell</u>	<b>AT END OF DRILLING</b> <u>---</u>
<b>NOTES</b> <u>Hand auger to 4'.</u>	<b>AFTER DRILLING</b> <u>---</u>

DEPTH (ft bgs)	SAMPLE TYPE NUMBER	PID (ppm)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BORING DIAGRAM
0						
0.5					<b>Asphalt.</b>	
1.0					<b>Baserock.</b>	
			CL		<b>Sandy Clay (CL);</b> black; 50-60% medium plasticity fines; 20-30% fine- to coarse-grain sand; 10-20% fine to coarse gravel to 1-1/2"; moist.  <b>Silty Clay (CL);</b> black; 90-100% medium to high plasticity fines; trace-10% fine-grain sand; moist.	
5.0					<b>Gravelly Sand (SP);</b> brown; 80-90% fine- to coarse-grain sand; 10-20% fine to coarse gravel to 1"; dry.	
7.0					<b>Silty Clay (CL);</b> black; 90-100% medium to high plasticity fines; trace-10% fine-grain sand; moist.	
	SB-3-8				@9' Olive-green staining; hydrocarbon odor.	
10			CL			Portland Cement
	SB-3-12	2				
15						
		17				
16.0			SP		<b>Sand (SP);</b> grey; 100% fine-grain sand; trace fine gravel; hydrocarbon odor; wet.	
18.0						
18.5			CL		<b>Silty Clay (CL);</b> brown and olive green; 90-100% medium plasticity fines; trace-10% fine-grain sand; moist.	
19.0			SP		<b>Sand (SP);</b> brown; 100% fine-grain sand; no odor; moist.	
19.5			CL		<b>Silty Clay (CL);</b> brown and olive green; 90-100% medium plasticity fines; trace-10% fine-grain sand; moist.	
20.0			SP		<b>Silty Clay (CL);</b> brown and olive green; 90-100% medium plasticity fines; trace-10% fine-grain sand; moist.	

BH COPY FCI DUBLIN SB-3.GPJ GINT US.GDT 12/3/09



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 Oakland, CA 94612

# BORING NUMBER SB-3

CLIENT Marcor PROJECT NAME FCI - Dublin  
 PROJECT NUMBER 1320.001 PROJECT LOCATION 5701 8th Street

DEPTH (ft bgs)	SAMPLE TYPE NUMBER	PID (ppm)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	BORING DIAGRAM
	SB-3-20				<p><b>Sand (SP);</b> brown; 100% fine-grain sand; no odor; moist.  <i>(Installed temporary PVC casing with 5' 0.010" slotted screen at the bottom. Approximately 1/4 gallon of groundwater was purged and a sample was collected with a peristaltic pump and new tubing.)</i>            Bottom of hole at 20.0 feet.</p>	

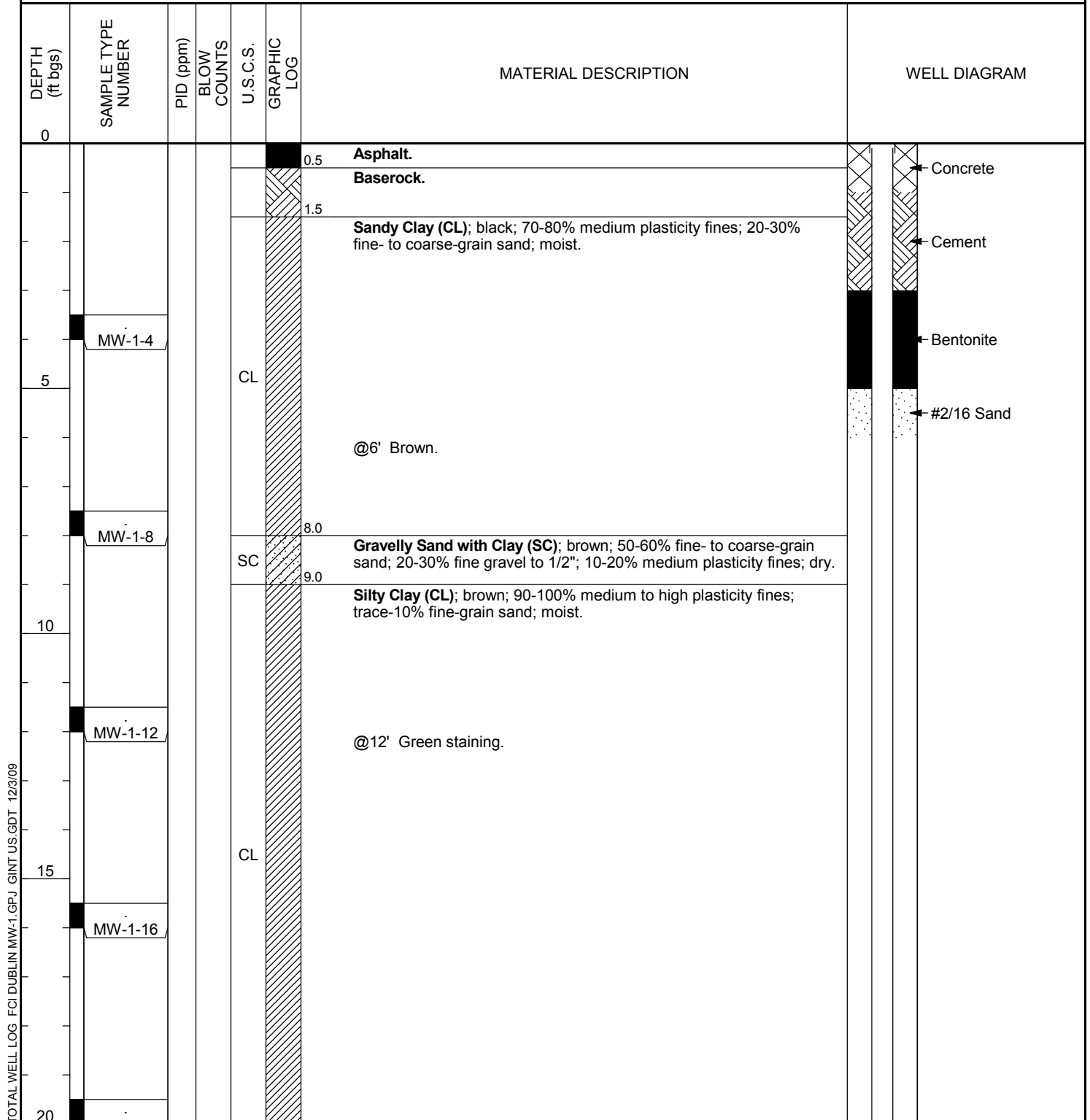


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 Oakland, CA 94612

# WELL NUMBER MW-1

PAGE 1 OF 2

<b>CLIENT</b> <u>Marcor</u>	<b>PROJECT NAME</b> <u>FCI - Dublin</u>
<b>PROJECT NUMBER</b> <u>1320.001</u>	<b>PROJECT LOCATION</b> <u>5701 8th Street</u>
<b>DATE STARTED</b> <u>9/1/09</u> <b>COMPLETED</b> <u>9/1/09</u>	<b>GROUND ELEVATION</b> _____ <b>HOLE SIZE</b> <u>2.75"</u>
<b>DRILLING CONTRACTOR</b> <u>RSI</u>	<b>GROUND WATER LEVELS:</b>
<b>DRILLING METHOD</b> <u>Direct Push - Dual Tube</u>	∇ <b>AT TIME OF DRILLING</b> <u>21.0 ft</u>
<b>LOGGED BY</b> <u>Morgan Gillies</u> <b>CHECKED BY</b> <u>Bob Clark-Riddell</u>	<b>AT END OF DRILLING</b> <u>---</u>
<b>NOTES</b> <u>Hand auger to 5'.</u>	<b>AFTER DRILLING</b> <u>---</u>



TOTAL WELL LOG FCI.DUBLIN.MW-1.GPJ GINT.US.GDT 12/3/09

(Continued Next Page)



Pangea Environmental Services, Inc.  
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# WELL NUMBER MW-1

PAGE 2 OF 2

CLIENT Marcor

PROJECT NAME FCI - Dublin

PROJECT NUMBER 1320.001

PROJECT LOCATION 5701 8th Street

DEPTH (ft bgs)	SAMPLE TYPE NUMBER	PID (ppm)	BLOW COUNTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
20	MW-1-20			CL		<b>Silty Clay (CL)</b> ; brown; 90-100% medium to high plasticity fines; trace-10% fine-grain sand; moist. <i>(continued)</i>	<p>0.010" slotted 3/4" Schedule 40 PVC Pre-packwell</p>
	MW-1-23			SP		<b>Sand (SP)</b> ; grey; 100% fine- to medium-grain sand; trace fine gravels; wet; strong hydrocarbon odor.	
25	MW-1-25					Bottom of hole at 25.0 feet.	



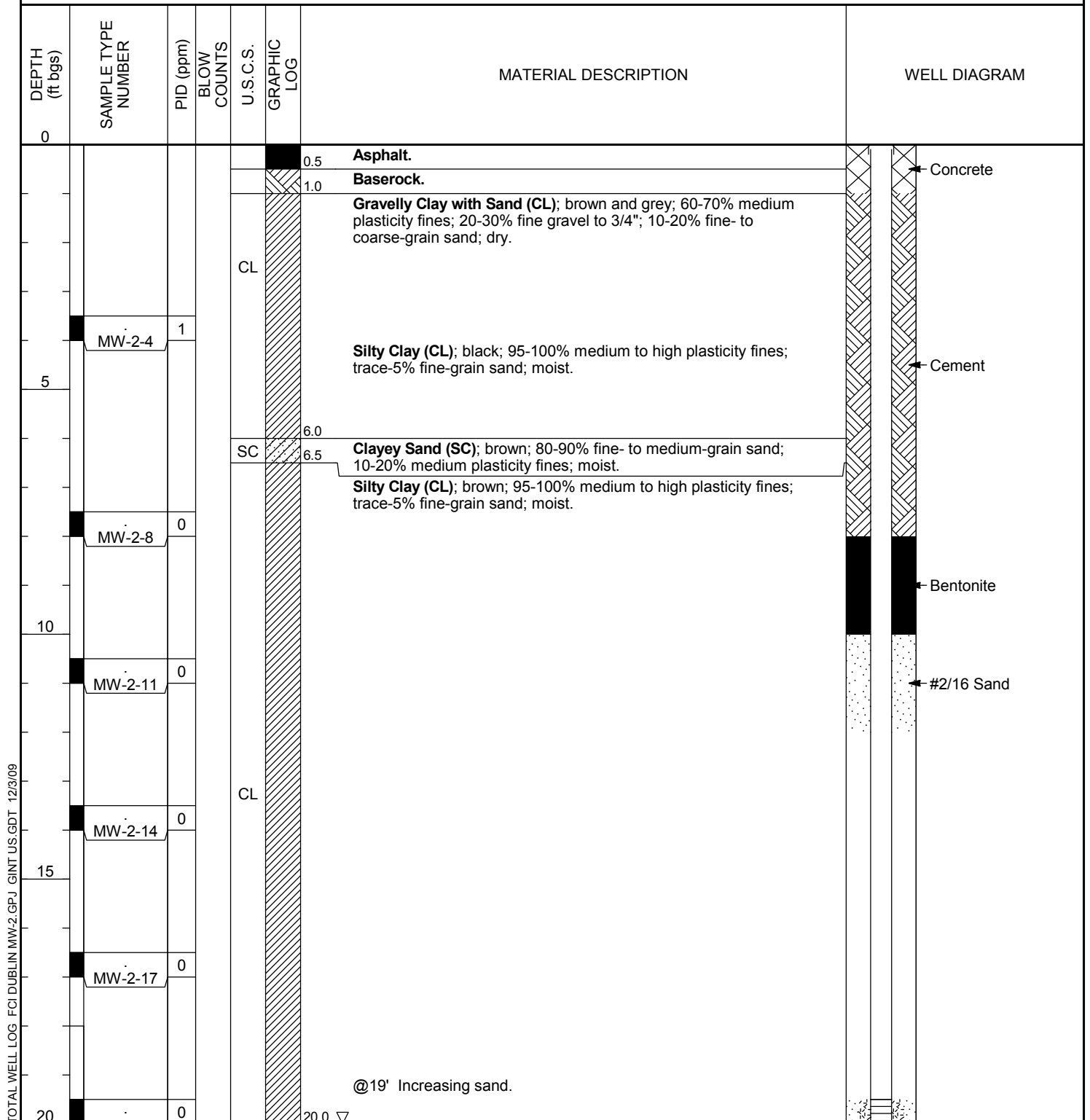


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 Oakland, CA 94612

# WELL NUMBER MW-2

PAGE 1 OF 2

<b>CLIENT</b> <u>Marcor</u>	<b>PROJECT NAME</b> <u>FCI - Dublin</u>
<b>PROJECT NUMBER</b> <u>1320.001</u>	<b>PROJECT LOCATION</b> <u>5701 8th Street</u>
<b>DATE STARTED</b> <u>9/1/09</u> <b>COMPLETED</b> <u>9/1/09</u>	<b>GROUND ELEVATION</b> _____ <b>HOLE SIZE</b> <u>2.75"</u>
<b>DRILLING CONTRACTOR</b> <u>RSI</u>	<b>GROUND WATER LEVELS:</b>
<b>DRILLING METHOD</b> <u>Direct Push - Dual Tube</u>	▽ <b>AT TIME OF DRILLING</b> <u>20.0 ft</u>
<b>LOGGED BY</b> <u>Morgan Gillies</u> <b>CHECKED BY</b> <u>Bob Clark-Riddell</u>	<b>AT END OF DRILLING</b> <u>---</u>
<b>NOTES</b> <u>Hand auger to 4'. Cored asphalt.</u>	<b>AFTER DRILLING</b> <u>---</u>



TOTAL WELL LOG FCI DUBLIN MW-2.GPJ GINT US GDT 12/3/09



Pangea Environmental Services, Inc.  
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# WELL NUMBER MW-2

PAGE 2 OF 2

CLIENT Marcor

PROJECT NAME FCI - Dublin

PROJECT NUMBER 1320.001

PROJECT LOCATION 5701 8th Street

DEPTH (ft bgs)	SAMPLE TYPE NUMBER	PID (ppm)	BLOW COUNTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
20	MW-2-20						
				SP		<b>Sand (SP)</b> ; tan; 100% fine- to coarse-grain sand; trace fine gravel to 3/4"; wet.	<p>0.010" Slotted 3/4" Schedule 40 PVC Pre-pack Well</p> <p>Sand</p> <p>Bentonite</p>
	MW-2-23	0		SC		<b>Clayey Sand with Gravel (SC)</b> ; 70-80% fine- to coarse-grain sand; 10-15% medium plasticity fines; 10-15% fine gravel to 1/2"; strong hydrocarbon odor; green staining; wet.	
25	MW-2-25	1		CL		<b>Silty Clay (CL)</b> ; olive green; 100% medium to high plasticity fines; moist.	
	MW-2-28	0				@27' Brown, no hydrocarbon odor.	
						Bottom of hole at 28.0 feet.	

TOTAL WELL LOG FCI DUBLIN MW-2.GPJ GINT US GDT 12/3/09

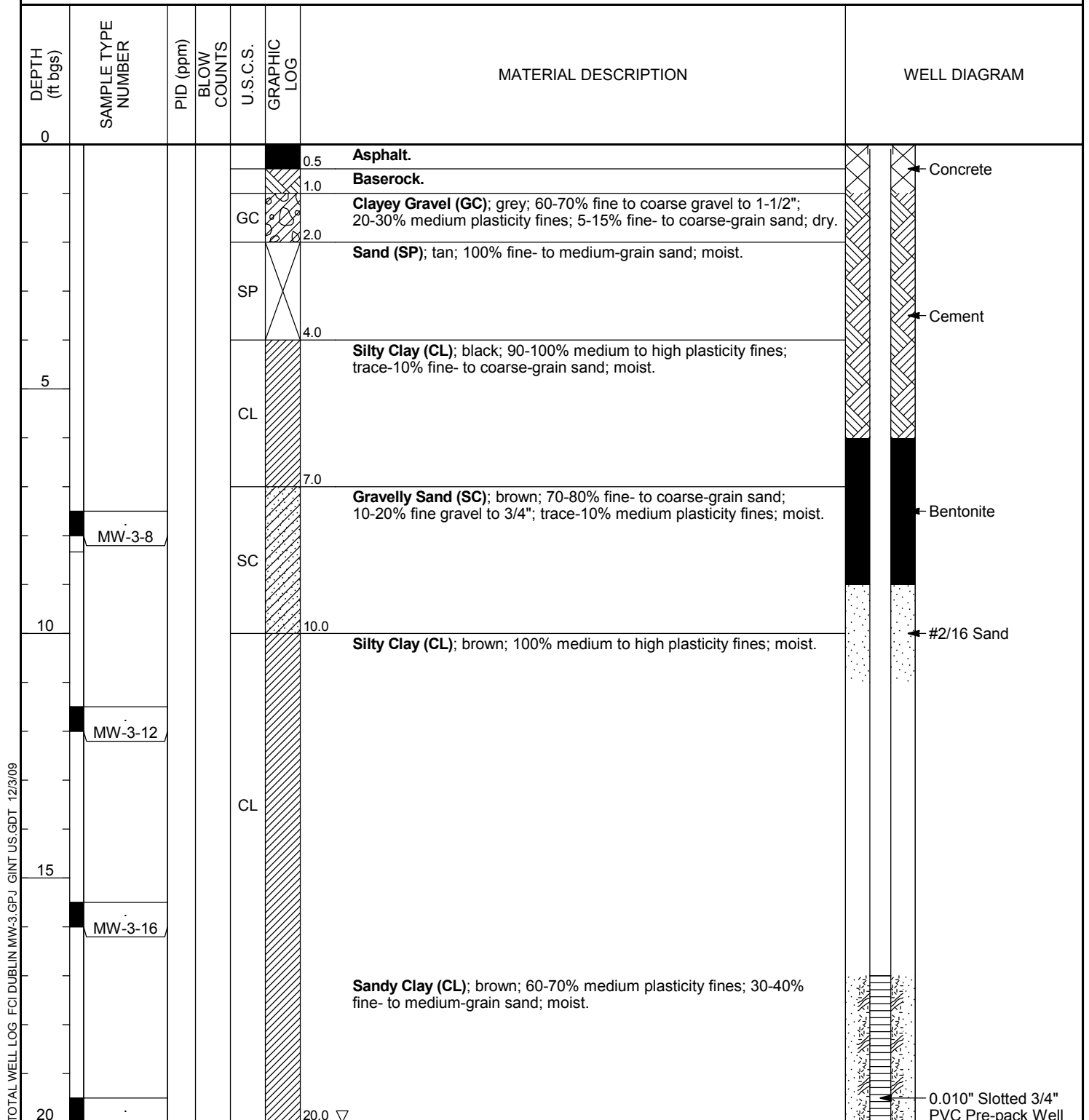


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 1710 Franklin Street Suite 200  
 Oakland, CA 94612

# WELL NUMBER MW-3

PAGE 1 OF 2

<b>CLIENT</b> <u>Marcor</u>	<b>PROJECT NAME</b> <u>FCI - Dublin</u>
<b>PROJECT NUMBER</b> <u>1320.001</u>	<b>PROJECT LOCATION</b> <u>5701 8th Street</u>
<b>DATE STARTED</b> <u>9/1/09</u> <b>COMPLETED</b> <u>9/1/09</u>	<b>GROUND ELEVATION</b> _____ <b>HOLE SIZE</b> <u>2.75"</u>
<b>DRILLING CONTRACTOR</b> <u>RSI</u>	<b>GROUND WATER LEVELS:</b>
<b>DRILLING METHOD</b> <u>Direct Push - Dual Tube</u>	▽ <b>AT TIME OF DRILLING</b> <u>20.0 ft</u>
<b>LOGGED BY</b> <u>Morgan Gillies</u> <b>CHECKED BY</b> <u>Bob Clark-Riddell</u>	<b>AT END OF DRILLING</b> <u>---</u>
<b>NOTES</b> <u>Hand auger to 4'.</u>	<b>AFTER DRILLING</b> <u>---</u>



(Continued Next Page)



Pangea Environmental Services, Inc.  
 1710 Franklin Street Suite 200  
 Oakland, CA 94612

# WELL NUMBER MW-3

PAGE 2 OF 2

CLIENT Marcor

PROJECT NAME FCI - Dublin

PROJECT NUMBER 1320.001

PROJECT LOCATION 5701 8th Street

DEPTH (ft bgs)	SAMPLE TYPE NUMBER	PID (ppm)	BLOW COUNTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
20	MW-3-20			SP		<b>Sand (SP)</b> ; brown; 95-100% fine- to coarse-grain sand; trace-5% fine gravel to 1/2"; wet.	
				CL		<b>Silty Clay (CL)</b> ; brown; 95-100% medium to high plasticity fines; trace-5% fine-grain sand; moist; slight green staining.	
	MW-3-24					Bottom of hole at 24.0 feet.	

## **APPENDIX E**

### **Surveyor's Report**

**Virgil Chavez Land Surveying**

721 Tuolumne Street

Vallejo, California, 94590

(707) 553-2476 • Fax (707) 553-8698

October 8, 2009

Project No.: 2588-11

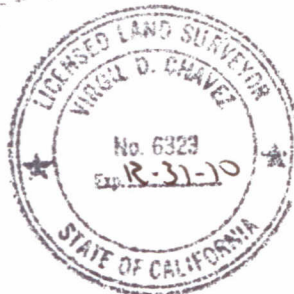
Morgan Gillies  
Pangea Environmental Services, Inc.  
1710 Franklin Street, Suite 200  
Oakland, CA. 94612

Subject: Monitoring Well Survey  
Dublin FCI  
5701 8th Street  
Dublin, CA

Dear Morgan:

This is to confirm that we have proceeded at your request to survey the monitoring wells located at the above referenced location. The survey was completed on September 28, 2009. The benchmark for this survey was a chiseled square on top center of the concrete curb at the north curb return at the northwest corner of the intersection of Dougherty Road and Dublin Blvd. The latitude, longitude and coordinates are for top of casings and are based on the California State Coordinate System, Zone III (NAD83).  
Benchmark Elevation = 330.60 feet (NGVD 29).

<u>Latitude</u>	<u>Longitude</u>	<u>Northing</u>	<u>Easting</u>	<u>Elev.</u>	<u>Desc.</u>
37.7173691	-121.8984643	2086694.63	6157182.01	364.59	RIM MW-1
				364.12	TOC MW-1
				363.77	RIM MW-2
37.7172470	-121.8985000	2086650.33	6157171.03	363.66	TOC MW-2
				361.37	RIM MW-3
37.7170758	-121.8983999	2086587.55	6157199.03	361.18	TOC MW-3



Sincerely,

A handwritten signature in black ink that reads "Virgil D. Chavez".

Virgil D. Chavez, PLS 6323

## **APPENDIX F**

### **Monitoring Well Field Data Sheets**



## WELL DEVELOPMENT FIELD DATA SHEET

Well ID: MW-1

Project.Task #: 1320.001.320				Project Name: FCI - Dublin						
Address: 5701 8th St., Dublin										
Date: 9/15/09				Weather: Sunny, Warm						
Well Diameter: 3/4 - inch				Volume/ft.	1" = 0.04	3" = 0.37	6" = 1.47	2" = 0.16	4" = 0.65	radius <sup>2</sup> * 0.163
Total Depth (TD): 24.42				Depth to Product:						
Depth to Water (DTW): 15.01				Product Thickness:						
Water Column Height: 9.41				1 Casing Volume: 0.2			gallons			
Reference Point: N Side TOC				20 Casing Volumes: 4.0			gallons			
Purging Device: Peristaltic pump + new tubing										
Time	Temp ©	pH	Cond (µs)	NTU	DO(mg/L)	ORP (mV)	Vol(gal)	DTW		
1115	20.7	6.9	1189	Grey	—	—	0.3			
1117	20.6	6.9	1171	Cloudy	—	—	0.5	Well dewatering		
1119	20.5	6.8	1183	Clear	—	—	0.7	(air in line)		
1121	20.7	6.8	1188	Clear	—	—	0.9			
1123	20.6	6.8	1186	Clear	—	—	1.1			
Stop pump and surge well for 5 min. Start pump.										
1131	21.2	6.9	1182	Grey	—	—	1.3			
1133	21.0	6.9	1190	Grey	—	—	1.5			
1135	20.6	6.9	1184	Cloudy	—	—	1.7			
1137	20.5	6.8	1177	Cloudy	—	—	1.9	Well dewatering		
1139	20.5	6.8	1180	Clear	—	—	2.1	(air in line)		
Stop pump and surge well for 5 min. Start pump.										
1152	20.8	6.9	1176	Grey	—	—	2.3			
1154	20.4	6.9	1179	Grey	—	—	2.5			
1156	20.1	6.9	1168	Cloudy	—	—	2.7			
1158	19.9	6.8	1164	Cloudy	—	—	2.9			
1200	19.9	6.8	1163	Clear	—	—	3.1			

Comments: Prior to purge, surge well for 10 min. with surge block. Hydrocarbon odor, heavy sheen.

Developer Name: Morgan Gillies      Signature: *[Signature]*









## WELL DEVELOPMENT FIELD DATA SHEET

Well ID: MW-2

Project.Task #: 1320.001.320 Project Name: FCI - Dublin

Address: 5701 8th St., Dublin

Date: 9/15/09 Weather: Sunny, Warm

Well Diameter: 3/4 - inch Volume/ft. 1" = 0.04 3" = 0.37 6" = 1.47 7 1/4" = 0.023  
2" = 0.16 4" = 0.65 radius<sup>2</sup>\* 0.163

Total Depth (TD): 23.90 Depth to Product: —

Depth to Water (DTW): 14.65 Product Thickness: —

Water Column Height: 9.25 1 Casing Volume: 0.2 gallons

Reference Point: N Side TOC 20 Casing Volumes: 4.0 gallons

Purging Device: Peristaltic Pump + New tubing

Time	Temp ©	pH	Cond (µs)	NTU	DO(mg/L)	ORP (mV)	Vol(gal)	DTW
957	20.5	7.3	1637	Grey	—	—	0.3	
1000	20.1	7.1	1538	Lt. Brown	—	—	0.5	
1003	20.0	7.0	1480	Lt. Brown	—	—	0.7	Becoming less turbid
1006	19.9	6.9	1391	Lt. Brown	—	—	0.9	
1008	19.9	6.8	1344	Cloudy	—	—	1.1	
1010	19.8	6.8	1333	Cloudy	—	—	1.3	
1012	19.8	6.8	1331	Cloudy	—	—	1.5	
1014	19.7	6.8	1320	Cloudy	—	—	1.7	
1016	19.7	6.8	1316	Cloudy	—	—	1.9	
1018	19.6	6.8	1304	Cloudy	—	—	2.1	
1020	19.7	6.8	1291	Clear	—	—	2.3	
1022	19.7	6.8	1263	Clear	—	—	2.5	
Raised + lowered tubing intake through water column. Stop pump + surge well for 5 min. Start purge again.								
1036	20.0	6.9	1231	Grey	—	—	2.9	
1032	19.8	6.8	1258	Brown	—	—	3.1	
1034	19.8	6.8	1261	Lt. Brown	—	—	3.3	

Comments: Hydrocarbon odor, Heavy Sheen Prior to purge surge well for 10 min. with surge block → sheen <sup>got lighter</sup> ~~went away~~ after initial gallon

Developer Name: Morgan Gillies Signature: 

**WELL DEVELOPMENT FIELD DATA SHEET**

Well ID: MW-3

Project.Task #: 1320.001.320	Project Name: FCI - Dublin		
Address: 5701 8th St., Dublin			
Date: 9/15/09	Weather: <u>Sunny, Warm</u>		
Well Diameter: 3/4 - inch	Volume/ft.	1" = 0.04	3" = 0.37
		2" = 0.16	4" = 0.65
		6" = 1.47	
		radius <sup>2</sup> * 0.163	
Total Depth (TD): <u>21.30</u>	Depth to Product: <u>—</u>		
Depth to Water (DTW): <u>12.58</u>	Product Thickness: <u>—</u>		
Water Column Height: <u>8.73</u>	1 Casing Volume: <u>0.2</u>	gallons	
Reference Point: N Side TOC	<u>20</u> Casing Volumes: <u>4.0</u>	gallons	

Purging Device: Peristaltic pump + new tubing

Time	Temp ©	pH	Cond (µs)	NTU	DO(mg/L)	ORP (mV)	Vol(gal)	DTW
800	19.8	6.3	1278	Brown	—	—	0.25	
805	20.2	6.4	1268	Cloudy	—	—	0.5	
Well dewatering - stop pump. Start pump @ 809								
811	20.3	6.6	1285	Cloudy	—	—	0.7	
Well dewatered again - remove tubing + surge for 5 min. Restart purge								
820	20.4	6.9	1241	Brown	—	—	0.9	
Well dewatered again - remove tubing + surge for 5 min.								
830	20.2	6.9	1273	Brown	—	—	1.1	
833	20.6	6.9	1241	Brown	—	—	1.3	
836	20.5	6.9	1272	Clear	—	—	1.5	
839	20.4	6.9	1271	Clear	—	—	1.7	
842	20.3	6.9	1271	Clear	—	—	1.9	
845	20.4	6.9	1270	Clear	—	—	2.1	
Remove tubing + surge well for 5 min.								
855	20.5	6.9	1263	Brown	—	—	2.3	
858	20.4	6.9	1267	Cloudy	—	—	2.5	
901	20.3	6.9	1265	Lt. Brown	—	—	2.7	

Comments: Prior to purge surge well for 10 min w/ surge block

Developer Name: <u>Morgan Gillies</u>	Signature: 
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Well Gauging Data Sheet

Project.Task #: 1320.001.320				Project Name: FCI - Dublin			
Address: 5701 8th St., Dublin						Date: 9/17/09	
Name: Morgan Gillies				Signature: <i>Morgan Gillies</i>			
Well ID	Well Size (in.)	Time	Depth to Immiscible Liquid (ft)	Thickness of Immiscible Liquid (ft)	Depth to Water (ft)	Total Depth (ft)	Measuring Point
MW-1	3/4	730			14.90	24.42	N side TOC
MW-2	3/4	734			14.64	23.90	↓
MW-3	3/4	738			12.52	21.30	↓

Comments: Removed well caps approximately 15 min. prior to measuring water levels.

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## MONITORING FIELD DATA SHEET

Well ID: MW-1

Project.Task #: 1320.001.320		Project Name: FCI-Dublin						
Address: 5701 8th St., Dublin								
Date: 9/17/09		Weather: Sunny, Warm						
Well Diameter: 3/4"		Volume/ft. 1" = 0.04' 3" = 0.37 6" = 1.47 2" = 0.16 4" = 0.65 radius <sup>2</sup> * 0.163						
Total Depth (TD): 24.42		Depth to Product: —						
Depth to Water (DTW): 14.90		Product Thickness: —						
Water Column Height: —		1 Casing Volume: — gallons						
Reference Point: N side TOC		Casing Volumes: — gallons						
Purging Device: Peristaltic Pump with new tubing								
Sampling Device: Peristaltic Pump with new tubing								
Time	Temp ©	pH	Cond (µs)	NTU	DO(mg/L)	ORP (mV)	Vol(gal)	DTW
1014	Set	pump intake @ approx. 2 ft depth. Rate ~ 150 ml/min.			14.91			
1019	21.5	6.73	1153	29	—	-74	300	15.64
1022	20.7	6.78	1155	12	—	-94	600	15.65
1025	20.6	6.80	1156	7.8	—	-95	900	15.66
1028	20.5	6.82	1157	6.5	—	-97	1,200	15.69
1031	20.4	6.81	1161	5.6	—	-100	1,500	15.73

Comments: Purge rate ~ 150 ml/min. Slight hydrocarbon odor

Sample ID: MW-1	Sample Time: 1040
Laboratory: McCampbell	Sample Date: 9/17/09
Containers/Preservative: 3 HCl VOAs, 2 HCl Amber Ls	
Analyzed for: TPHd, BTEX and Napthalene by 8260	
Sampler Name: Morgan Gillies	Signature: 



## MONITORING FIELD DATA SHEET

Well ID: *MW-2*

Project.Task #: 1320.001.320				Project Name: FCI-Dublin				
Address: 5701 8th St., Dublin								
Date: 9/17/09				Weather: <i>Overcast</i>				
Well Diameter: <i>3/4"</i>				Volume/ft.		1" = 0.04    3" = 0.37    6" = 1.47		
				2" = 0.16    4" = 0.65		radius <sup>2</sup> * 0.163		
Total Depth (TD): <i>23.90</i>				Depth to Product: <i>—</i>				
Depth to Water (DTW): <i>14.64</i>				Product Thickness: <i>—</i>				
Water Column Height: <i>—</i>				1 Casing Volume: <i>—</i>		gallons		
Reference Point: N side TOC				Casing Volumes: <i>—</i>		gallons		
Purging Device: Peristaltic Pump with new tubing								
Sampling Device: Peristaltic Pump with new tubing								
Time	Temp ©	pH	Cond (µs)	NTU	DO(mg/L)	ORP (mV)	Vol( <sup>ML</sup> gal)	DTW
<i>906</i>	<i>Set pump intake @ approx 26.5ft.</i>			<i>Rate ~ 100 ml/min</i>				<i>14.63</i>
<i>913</i>	<i>20.9</i>	<i>6.43</i>	<i>1286</i>	<i>13</i>	<i>—</i>	<i>80</i>	<i>300</i>	<i>14.88</i>
<i>916</i>	<i>20.7</i>	<i>6.56</i>	<i>1275</i>	<i>14</i>	<i>—</i>	<i>49</i>	<i>600</i>	<i>14.90</i>
<i>919</i>	<i>20.5</i>	<i>6.69</i>	<i>1234</i>	<i>7.3</i>	<i>—</i>	<i>44</i>	<i>900</i>	<i>14.90</i>
<i>922</i>	<i>20.5</i>	<i>6.69</i>	<i>1228</i>	<i>5.8</i>	<i>—</i>	<i>25</i>	<i>1,200</i>	<i>14.90</i>
<i>925</i>	<i>20.5</i>	<i>6.66</i>	<i>1227</i>	<i>5.9</i>	<i>—</i>	<i>19</i>	<i>1,500</i>	<i>14.90</i>
<i>928</i>	<i>20.5</i>	<i>6.70</i>	<i>1223</i>	<i>4.8</i>	<i>—</i>	<i>16</i>	<i>1,800</i>	<i>14.90</i>

Comments: *Purge rate ~ 100 ml/min*

Sample ID: <i>MW-2</i>	Sample Time: <i>935</i>
Laboratory: McCampbell	Sample Date: 9/17/09
Containers/Preservative: 3 HCl VOAs, 2 HCl Amber Ls	
Analyzed for: TPHd, BTEX and Napthalene by 8260	
Sampler Name: Morgan Gillies	Signature: <i>[Signature]</i>



## MONITORING FIELD DATA SHEET

Well ID: *MW-3*

Project.Task #: 1320.001.320		Project Name: FCI-Dublin	
Address: 5701 8th St., Dublin			
Date: 9/17/09		Weather: <i>Overcast</i>	
Well Diameter: <i>3/4"</i>	Volume/ft.	1" = 0.04	3" = 0.37
		2" = 0.16	4" = 0.65
		6" = 1.47	
		radius <sup>2</sup> * 0.163	
Total Depth (TD): <i>21.30</i>	Depth to Product: <i>—</i>		
Depth to Water (DTW): <i>12.52</i>	Product Thickness: <i>—</i>		
Water Column Height: <i>—</i>	1 Casing Volume: <i>—</i>		gallons
Reference Point: N side TOC	Casing Volumes: <i>—</i>		gallons
Purging Device: Peristaltic Pump with new tubing			
Sampling Device: Peristaltic Pump with new tubing			
Time	Temp (°C)	pH	Cond (µs)
			NTU
			DO(mg/L)
			ORP (mV)
			Vol( <i>ml</i> )
			DTW
<i>803</i>	<i>Insert new tubing into well. Inlet</i>	<i>Pre: approx 19ft. depth</i>	<i>12.54</i>
<i>810</i>	<i>21.1</i>	<i>6.47</i>	<i>1252</i>
			<i>6.6</i>
			<i>—</i>
			<i>154</i>
			<i>450</i>
			<i>14.73</i>
			<i>Slow pump rate to approx 100 mL/min</i>
<i>815</i>	<i>20.8</i>	<i>6.51</i>	<i>1264</i>
			<i>5.8</i>
			<i>—</i>
			<i>99</i>
			<i>1000</i>
			<i>14.63</i>
<i>818</i>	<i>20.9</i>	<i>6.57</i>	<i>1262</i>
			<i>2.8</i>
			<i>—</i>
			<i>89</i>
			<i>1,300</i>
			<i>14.65</i>
<i>821</i>	<i>20.9</i>	<i>6.56</i>	<i>1259</i>
			<i>2.0</i>
			<i>—</i>
			<i>87</i>
			<i>1,600</i>
			<i>14.67</i>
<i>824</i>	<i>20.7</i>	<i>6.59</i>	<i>1259</i>
			<i>2.0</i>
			<i>—</i>
			<i>81</i>
			<i>1,900</i>
			<i>14.66</i>
<i>827</i>	<i>20.8</i>	<i>6.62</i>	<i>1259</i>
			<i>1.4</i>
			<i>—</i>
			<i>78</i>
			<i>2,200</i>
			<i>14.50</i>

Comments: *Purge rate = 150 mL/min, slowed to 100 mL/min.*

Sample ID: <i>MW-3</i>	Sample Time: <i>830</i>
Laboratory: McCampbell	Sample Date: 9/17/09
Containers/Preservative: 3 HCl VOAs, 2 HCl Amber Ls	
Analyzed for: TPHd, BTEX and Napthalene by 8260	
Sampler Name: Morgan Gillies	Signature: <i>[Signature]</i>

## **APPENDIX G**

### **Laboratory Analytical Reports**



**McC Campbell Analytical, Inc.**

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701  
Web: www.mcccampbell.com E-mail: main@mcccampbell.com  
Telephone: 877-252-9262 Fax: 925-252-9269

Pangea Environmental Svcs., Inc.  1710 Franklin Street, Ste. 200  Oakland, CA 94612	Client Project ID: #1320.001; FCI - Dublin	Date Sampled: 08/31/09-09/02/09
		Date Received: 09/03/09
	Client Contact: Morgan Gillies	Date Reported: 09/11/09
	Client P.O.:	Date Completed: 09/11/09

**WorkOrder: 0909113**

September 11, 2009

Dear Morgan:

Enclosed within are:

- 1) The results of the **33** analyzed samples from your project: **#1320.001; FCI - Dublin,**
- 2) A QC report for the above samples,
- 3) A copy of the chain of custody, and
- 4) An invoice for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing

McC Campbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius  
Laboratory Manager  
McC Campbell Analytical, Inc.



0909113

Pg. 1 of 4

**McCAMPBELL ANALYTICAL, INC.**

1534 Willow Pass Road  
Pittsburg, CA 94565

Website: [www.mccampbell.com](http://www.mccampbell.com) Email: [main@mccampbell.com](mailto:main@mccampbell.com)  
Telephone: (925) 252-9262 Fax: (925) 252-9269

**CHAIN OF CUSTODY RECORD**

TURN AROUND TIME      5 DAY  
EDF Required? Coelt (Normal) No Write On (DW) No

Report To: Morgan Gillies Bill To: Pangea  
Company: Pangea Environmental Services, Inc.  
1710 Franklin Street, Suite 200, Oakland, CA 94612  
E-Mail: [mgillies@pangeaenv.com](mailto:mgillies@pangeaenv.com)  
Tele: (510) 836-3702 Fax: (510) 836-3709  
Project #: 1320.001 Project Name: FCI - Dublin  
Project Location: 5701 8<sup>th</sup> St., Dublin  
Sampler Signature: *[Signature]*

Analysis Request											Other	Comments					
SAMPLE ID	LOCATION (Field Point Name)	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED				Other	Comments	
		Date	Time			Water	Soil	Air	Sludge	Other	ICE	HCL	HNO <sub>3</sub>	Other			
H-2	H	8/3/09	1200	1	Pross	X					X						
H-3	H		1205														
G-6	G		1150														HOLD
G-5	G		1145														
G-3	G		1100														
G-1.5	G		1050														HOLD
G-1	G		1045														HOLD
E-3	E		1015														
E-2	E		1005														
E-1	E		1000														
SB-2-6	SB-2		925														
SB-2-8	SB-2		940														
MW-3-8	MW-3	9/1/09	1010		Acetic												HOLD
MW-3-12	MW-3		1020														

Relinquished By: *[Signature]* Date: 8/3/09 Time: 2:55 Received By: *[Signature]*  
Relinquished By: *[Signature]* Date: 9/3/09 Time: 4:45 Received By: *[Signature]*  
Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_

COMMENTS:  
ICE/T° 30°C ✓  
GOOD CONDITION ✓  
HEAD SPACE ABSENT ✓  
DECHLORINATED IN LAB ✓  
APPROPRIATE CONTAINERS ✓  
PRESERVED IN LAB ✓  
VOAS O&G METALS OTHER  
PRESERVATION pH<2



**McCAMPBELL ANALYTICAL, INC.**  
 1534 Willow Pass Road  
 Pittsburg, CA 94565  
 Website: [www.mccampbell.com](http://www.mccampbell.com) Email: [main@mccampbell.com](mailto:main@mccampbell.com)  
 Telephone: (925) 252-9262 Fax: (925) 252-9269

**CHAIN OF CUSTODY RECORD**  
**TURN AROUND TIME**       
 RUSH 24 HR 48 HR 72 HR 5 DAY  
 EDF Required? Coelt (Normal) No Write On (DW) No

Report To: Morgan Gillies Bill To: Pangea  
 Company: Pangea Environmental Services, Inc.  
 1710 Franklin Street, Suite 200, Oakland, CA 94612  
 E-Mail: [mgillies@pangeaenv.com](mailto:mgillies@pangeaenv.com)  
 Tele: (510) 836-3702 Fax: (510) 836-3709  
 Project #: 1320.001 Project Name: FCI - Dublin  
 Project Location: 5701 8<sup>th</sup> St., Dublin  
 Sampler Signature: *[Signature]*

Analysis Request												Other	Comments				
SAMPLE ID	LOCATION (Field Point Name)	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED		BTX & TPH as Gas (602/8020 + 8015)/MTBE TPH as Diesel (8015) w/ Silica Gel Cleanup Total Petroleum Oil & Grease (5520 E&F/B&F) Total Petroleum Hydrocarbons (418.1) EPA 601 / 8010 / 8021 BTEX ONLY (EPA 602 / 8020) EPA 608 / 8081 EPA 608 / 8082 PCB's ONLY EPA 8140 / 8141 EPA 8150 / 8151 EPA 524.2 / 624 / 8260 EPA 525 / 625 / 8270 PAH's / PNA's by EPA 625 / 8270 / 8310 CAM-17 Metals (6010 / 6020) LUFT 5 Metals (6010 / 6020) Lead (200.8 / 200.9 / 6010) Naphthalene by EPA Method 8260	Other	Filter Samples for Metals analysis: Yes / No		
		Date	Time			Water	Soil	Air	Sludge	Other	ICE	HCL				HNO <sub>3</sub>	Other
MW-3-16	MW-3	9/1/09	1015	1	Acid 1/2	X					X						
MW-3-20	MW-3		1023								X						
MW-3-24	MW-3		1025								X						
MW-1-4	MW-1		1110								X						
MW-1-8	MW-1		1115								X						
MW-1-12	MW-1		1117								X						
MW-1-16	MW-1		1120								X						
MW-1-20	MW-1		1123								X						
MW-1-23	MW-1		1125								X						
MW-1-25	MW-1		1130								X						
MW-2-4	MW-2		755								X						
MW-2-8	MW-2		800								X						
MW-2-11	MW-2		805								X						
MW-2-14	MW-2		810								X						

Relinquished By: *[Signature]* Date: 9/3/09 Time: 9:25 AM Received By: *[Signature]*  
 Relinquished By: *[Signature]* Date: 9/3/09 Time: 9:45 AM Received By: *[Signature]*  
 Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_

ICE/r<sup>e</sup> \_\_\_\_\_ COMMENTS:  
 GOOD CONDITION \_\_\_\_\_  
 HEAD SPACE ABSENT \_\_\_\_\_  
 DECHLORINATED IN LAB \_\_\_\_\_  
 APPROPRIATE CONTAINERS \_\_\_\_\_  
 PRESERVED IN LAB \_\_\_\_\_  
 VOAS O&G METALS OTHER  
 PRESERVATION pH<2



### McCAMPBELL ANALYTICAL, INC.

1534 Willow Pass Road  
Pittsburg, CA 94565

Website: [www.mccampbell.com](http://www.mccampbell.com) Email: [main@mccampbell.com](mailto:main@mccampbell.com)  
Telephone: (925) 252-9262 Fax: (925) 252-9269

### CHAIN OF CUSTODY RECORD

TURN AROUND TIME

RUSH 24 HR 48 HR 72 HR 5 DAY

EDF Required? Coelt (Normal) No Write On (DW) No

Report To: Morgan Gillies Bill To: Pangea  
Company: Pangea Environmental Services, Inc.  
1710 Franklin Street, Suite 200, Oakland, CA 94612  
E-Mail: [mgillies@pangeaenv.com](mailto:mgillies@pangeaenv.com)  
Tele: (510) 836-3702 Fax: (510) 836-3709  
Project #: 1320.001 Project Name: FCI - Dublin  
Project Location: 5701 8<sup>th</sup> St., Dublin  
Sampler Signature: *[Signature]*

Analysis Request Other Comments

SAMPLE ID	LOCATION (Field Point Name)	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED				BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015) w/ Silica Gel Cleanup	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010 / 8021	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8081	EPA 608 / 8082 PCB's ONLY	EPA 8140 / 8141	EPA 8150 / 8151	EPA 524.2 / 624 / 8260	EPA 525 / 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals (6010 / 6020)	LUFT 5 Metals (6010 / 6020)	Lead (200.8 / 200.9 / 6010)	Naphthalene by EPA Method 8260 + BTEX		Filter Samples for Metals analysis: Yes / No			
		Date	Time			Water	Soil	Air	Sludge	Other	ICE	HCL	HNO <sub>3</sub>	Other																						
MW-2-17	MW-2	9/1/09	815	1	Acetic Glass		X					X																								
MW-2-20	MW-2		820																																	
MW-2-23	MW-2		825																																HOLD	
MW-2-25	MW-2		830																																HOLD	
MW-2-28	MW-2		840																																	
SB-1-8	SB-1	9/2/09	815																																	
SB-1-12	SB-1		817																																	
SB-1-16	SB-1		820																																	
SB-1-19	SB-1		825																																	HOLD
SB-1-22	SB-1		830																																HOLD	
SB-1-24	SB-1		835																																HOLD	
SB-1	SB-1		930	4	Acetic Glass		X					X	X																							
SB-3	SB-3		1100	4			X					X	X																							
SB-3-8	SB-3		1015	1	Acetic Glass		X					X																								

Relinquished By: *[Signature]* Date: 9/3/09 Time: 4:55 PM Received By: *[Signature]*  
Relinquished By: *[Signature]* Date: 9/3/09 Time: 4:45 PM Received By: *[Signature]*  
Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_

ICE/° \_\_\_\_\_ COMMENTS:  
GOOD CONDITION \_\_\_\_\_  
HEAD SPACE ABSENT \_\_\_\_\_  
DECHLORINATED IN LAB \_\_\_\_\_  
APPROPRIATE CONTAINERS \_\_\_\_\_  
PRESERVED IN LAB \_\_\_\_\_  
VOAS O&G METALS OTHER  
PRESERVATION pH<2







# McC Campbell Analytical, Inc.



1534 Willow Pass Rd  
Pittsburg, CA 94565-1701  
(925) 252-9262

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 0909113

ClientCode: PEO

WaterTrax   
  WriteOn   
  EDF   
  Excel   
  Fax   
  Email   
  HardCopy   
  ThirdParty   
  J-flag

**Report to:**  
 Morgan Gillies  
 Pangea Environmental Svcs., Inc.  
 1710 Franklin Street, Ste. 200  
 Oakland, CA 94612  
 (510) 836-3700    FAX (510) 836-3709

**Email:** mgillies@pangeaenv.com  
**cc:**  
**PO:**  
**ProjectNo:** #1320.001; FCI - Dublin

**Bill to:**  
 Bob Clark-Riddell  
 Pangea Environmental Svcs., Inc.  
 1710 Franklin Street, Ste. 200  
 Oakland, CA 94612

**Requested TAT:** 5 days  
**Date Received:** 09/03/2009  
**Date Printed:** 09/03/2009

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
0909113-001	H-2	Soil	8/31/2009 12:00	<input type="checkbox"/>		A	A										
0909113-002	H-3	Soil	8/31/2009 12:05	<input type="checkbox"/>			A										
0909113-004	G-5	Soil	8/31/2009 11:45	<input type="checkbox"/>			A										
0909113-005	G-3	Soil	8/31/2009 11:00	<input type="checkbox"/>			A										
0909113-008	E-3	Soil	8/31/2009 10:15	<input type="checkbox"/>			A										
0909113-009	E-2	Soil	8/31/2009 10:05	<input type="checkbox"/>			A										
0909113-010	E-1	Soil	8/31/2009 10:00	<input type="checkbox"/>			A										
0909113-011	SB-2-6	Soil	8/31/2009 9:25	<input type="checkbox"/>			A										
0909113-012	SB-2-8	Soil	8/31/2009 9:40	<input type="checkbox"/>			A										
0909113-014	MW-3-12	Soil	9/1/2009 10:20	<input type="checkbox"/>			A										
0909113-015	MW-3-16	Soil	9/1/2009 10:15	<input type="checkbox"/>			A										
0909113-016	MW-3-20	Soil	9/1/2009 10:23	<input type="checkbox"/>			A										
0909113-017	MW-3-24	Soil	9/1/2009 10:25	<input type="checkbox"/>			A										
0909113-018	MW-1-4	Soil	9/1/2009 11:10	<input type="checkbox"/>			A										

**Test Legend:**

1	8260VOC_W	2	PREDF REPORT	3	TPH(D)WSG_S	4	TPH(D)WSG_W	5	
6		7		8		9		10	
11		12							

Prepared by: Melissa Valles

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.

# McC Campbell Analytical, Inc.



1534 Willow Pass Rd  
Pittsburg, CA 94565-1701  
(925) 252-9262

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 0909113

ClientCode: PEO

WaterTrax   
  WriteOn   
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  HardCopy   
  ThirdParty   
  J-flag

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**cc:**  
**PO:**  
**ProjectNo:** #1320.001; FCI - Dublin

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 Pangea Environmental Svcs., Inc.  
 1710 Franklin Street, Ste. 200  
 Oakland, CA 94612

**Requested TAT:** 5 days  
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**Date Printed:** 09/03/2009

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
0909113-019	MW-1-8	Soil	9/1/2009 11:15	<input type="checkbox"/>			A										
0909113-020	MW-1-12	Soil	9/1/2009 11:17	<input type="checkbox"/>			A										
0909113-021	MW-1-16	Soil	9/1/2009 11:20	<input type="checkbox"/>			A										
0909113-022	MW-1-20	Soil	9/1/2009 11:23	<input type="checkbox"/>			A										
0909113-023	MW-1-23	Soil	9/1/2009 11:25	<input type="checkbox"/>			A										
0909113-024	MW-1-25	Soil	9/1/2009 11:30	<input type="checkbox"/>			A										
0909113-025	MW-2-4	Soil	9/1/2009 7:55	<input type="checkbox"/>			A										
0909113-027	MW-2-11	Soil	9/1/2009 8:05	<input type="checkbox"/>			A										
0909113-029	MW-2-17	Soil	9/1/2009 8:15	<input type="checkbox"/>			A										
0909113-030	MW-2-20	Soil	9/1/2009 8:20	<input type="checkbox"/>			A										
0909113-032	MW-2-25	Soil	9/1/2009 8:30	<input type="checkbox"/>			A										
0909113-034	SB-1-8	Soil	9/2/2009 8:15	<input type="checkbox"/>			A										
0909113-035	SB-1-12	Soil	9/2/2009 8:17	<input type="checkbox"/>			A										
0909113-036	SB-1-16	Soil	9/2/2009 8:20	<input type="checkbox"/>			A										

**Test Legend:**

1	8260VOC_W	2	PREDF REPORT	3	TPH(D)WSG_S	4	TPH(D)WSG_W	5	
6		7		8		9		10	
11		12							

Prepared by: Melissa Valles

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.

# McC Campbell Analytical, Inc.



1534 Willow Pass Rd  
Pittsburg, CA 94565-1701  
(925) 252-9262

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 0909113

ClientCode: PEO

WaterTrax   
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**PO:**  
**ProjectNo:** #1320.001; FCI - Dublin

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 Bob Clark-Riddell  
 Pangea Environmental Svcs., Inc.  
 1710 Franklin Street, Ste. 200  
 Oakland, CA 94612

**Requested TAT:** 5 days  
**Date Received:** 09/03/2009  
**Date Printed:** 09/03/2009

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
0909113-040	SB-1	Water	9/2/2009 9:30	<input type="checkbox"/>	A			B									
0909113-041	SB-3	Water	9/2/2009 11:00	<input type="checkbox"/>	A			B									
0909113-042	SB-3-8	Soil	9/2/2009 10:15	<input type="checkbox"/>			A										
0909113-043	SB-3-12	Soil	9/2/2009 10:17	<input type="checkbox"/>			A										
0909113-044	SB-3-20	Soil	9/2/2009 10:25	<input type="checkbox"/>			A										

**Test Legend:**

1	8260VOC_W	2	PREDF REPORT	3	TPH(D)WSG_S	4	TPH(D)WSG_W	5	
6		7		8		9		10	
11		12							

Prepared by: Melissa Valles

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
Hazardous samples will be returned to client or disposed of at client expense.



**Sample Receipt Checklist**

Client Name: **Pangea Environmental Svcs., Inc.**

Date and Time Received: **9/3/2009 4:53:08 PM**

Project Name: **#1320.001; FCI - Dublin**

Checklist completed and reviewed by: **Melissa Valles**

WorkOrder N°: **0909113** Matrix Soil/Water

Carrier: Rob Pringle (MAI Courier)

**Chain of Custody (COC) Information**

- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Sample IDs noted by Client on COC? Yes  No
- Date and Time of collection noted by Client on COC? Yes  No
- Sampler's name noted on COC? Yes  No

**Sample Receipt Information**

- Custody seals intact on shipping container/cooler? Yes  No  NA
- Shipping container/cooler in good condition? Yes  No
- Samples in proper containers/bottles? Yes  No
- Sample containers intact? Yes  No
- Sufficient sample volume for indicated test? Yes  No

**Sample Preservation and Hold Time (HT) Information**

- All samples received within holding time? Yes  No
  - Container/Temp Blank temperature Cooler Temp: 3.8°C NA
  - Water - VOA vials have zero headspace / no bubbles? Yes  No  No VOA vials submitted
  - Sample labels checked for correct preservation? Yes  No
  - TTLC Metal - pH acceptable upon receipt (pH<2)? Yes  No  NA
  - Samples Received on Ice? Yes  No
- (Ice Type: WET ICE )

\* NOTE: If the "No" box is checked, see comments below.

-----

Client contacted:

Date contacted:

Contacted by:

Comments:



# McC Campbell Analytical, Inc.

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701  
Web: www.mcccampbell.com E-mail: main@mcccampbell.com  
Telephone: 877-252-9262 Fax: 925-252-9269

Pangea Environmental Svcs., Inc.  1710 Franklin Street, Ste. 200  Oakland, CA 94612	Client Project ID: #1320.001; FCI - Dublin	Date Sampled: 09/02/09
	Client Contact: Morgan Gillies	Date Received: 09/03/09
	Client P.O.:	Date Extracted: 09/04/09-09/05/09
		Date Analyzed: 09/04/09-09/05/09

### Volatile Organics by P&T and GC/MS\*

Extraction Method: SW5030B

Analytical Method: SW8260B

Work Order: 0909113

Lab ID	0909113-040A	0909113-041A			Reporting Limit for DF =1	
Client ID	SB-1	SB-3				
Matrix	W	W				
DF	1	1				

Compound	Concentration				ug/kg	µg/L
Benzene	ND	ND			NA	0.5
Ethylbenzene	ND	ND			NA	0.5
Naphthalene	ND	36			NA	0.5
Toluene	ND	ND			NA	0.5
Xylenes	ND	ND			NA	0.5

### Surrogate Recoveries (%)

%SS1:	90	90		
%SS2:	93	92		
%SS3:	103	118		

<b>Comments</b>	b1			
-----------------	----	--	--	--

\* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

# surrogate diluted out of range or surrogate coelutes with another peak.

b1) aqueous sample that contains greater than ~1 vol. % sediment



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Pangea Environmental Svcs., Inc.  1710 Franklin Street, Ste. 200  Oakland, CA 94612	Client Project ID: #1320.001; FCI - Dublin	Date Sampled: 08/31/09-09/02/09
	Client Contact: Morgan Gillies	Date Received: 09/03/09
	Client P.O.:	Date Analyzed 09/04/09-09/10/09
		Date Extracted: 09/03/09

### Total Extractable Petroleum Hydrocarbons with Silica Gel Clean-Up\*

Extraction method SW3510C/3630C/SW3550C/3630C

Analytical methods: SW8015B

Work Order: 0909113

Lab ID	Client ID	Matrix	TPH-Diesel (C10-C23)	DF	% SS	Comments
0909113-001A	H-2	S	15	5	93	e7,e2
0909113-002A	H-3	S	4.2	1	96	e7,e2
0909113-004A	G-5	S	2.1	1	98	e2
0909113-005A	G-3	S	3.4	1	98	e7,e2
0909113-008A	E-3	S	ND	1	97	
0909113-009A	E-2	S	4.2	1	96	e2
0909113-010A	E-1	S	1600	20	89	e1/e10
0909113-011A	SB-2-6	S	120	1	98	e3,e7
0909113-012A	SB-2-8	S	23	1	97	e8,e7
0909113-014A	MW-3-12	S	ND	1	97	
0909113-015A	MW-3-16	S	ND	1	97	
0909113-016A	MW-3-20	S	ND	1	96	
0909113-017A	MW-3-24	S	47	1	97	e8/e1
0909113-018A	MW-1-4	S	49	10	88	e7,e2
0909113-019A	MW-1-8	S	ND	1	97	

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	1.0	mg/Kg

\* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

# cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract/matrix interference.

+The following descriptions of the TPH chromatogram are cursory in nature and McC Campbell Analytical is not responsible for their interpretation:

- b1) aqueous sample that contains greater than ~1 vol. % sediment
- e1) unmodified or weakly modified diesel is significant; and/or e8) kerosene/kerosene range/jet fuel range
- e1) unmodified or weakly modified diesel is significant; and/or e10) fuel oil
- e2) diesel range compounds are significant; no recognizable pattern
- e3) aged diesel is significant
- e7) oil range compounds are significant
- e8) kerosene/kerosene range/jet fuel range; and/or e1) unmodified or weakly modified diesel is significant



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Telephone: 877-252-9262 Fax: 925-252-9269

Pangea Environmental Svcs., Inc.  1710 Franklin Street, Ste. 200  Oakland, CA 94612	Client Project ID: #1320.001; FCI - Dublin	Date Sampled: 08/31/09-09/02/09
	Client Contact: Morgan Gillies	Date Received: 09/03/09
	Client P.O.:	Date Analyzed 09/04/09-09/10/09
		Date Extracted: 09/03/09

### Total Extractable Petroleum Hydrocarbons with Silica Gel Clean-Up\*

Extraction method SW3510C/3630C/SW3550C/3630C

Analytical methods: SW8015B

Work Order: 0909113

Lab ID	Client ID	Matrix	TPH-Diesel (C10-C23)	DF	% SS	Comments
0909113-020A	MW-1-12	S	ND	1	96	
0909113-021A	MW-1-16	S	1.3	1	95	e2
0909113-022A	MW-1-20	S	4.6	1	96	e3
0909113-023A	MW-1-23	S	1800	50	91	e1/e8
0909113-024A	MW-1-25	S	1600	50	90	e1/e8
0909113-025A	MW-2-4	S	62	50	97	e7,e2
0909113-027A	MW-2-11	S	ND	1	95	
0909113-029A	MW-2-17	S	ND	1	96	
0909113-030A	MW-2-20	S	2.0	1	97	e2
0909113-032A	MW-2-25	S	2400	50	85	e1/e8
0909113-034A	SB-1-8	S	ND	1	98	
0909113-035A	SB-1-12	S	ND	1	94	
0909113-036A	SB-1-16	S	ND	1	97	
0909113-040B	SB-1	W	ND	1	96	b1
0909113-041B	SB-3	W	2000	1	96	e8/e1

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	1.0	mg/Kg

\* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

# cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract/matrix interference.

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- e1) unmodified or weakly modified diesel is significant; and/or e10) fuel oil
- e2) diesel range compounds are significant; no recognizable pattern
- e3) aged diesel is significant
- e7) oil range compounds are significant
- e8) kerosene/kerosene range/jet fuel range; and/or e1) unmodified or weakly modified diesel is significant



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	Client Contact: Morgan Gillies	Date Received: 09/03/09
	Client P.O.:	Date Analyzed 09/04/09-09/10/09
		Date Extracted: 09/03/09

### Total Extractable Petroleum Hydrocarbons with Silica Gel Clean-Up\*

Extraction method SW3510C/3630C/SW3550C/3630C

Analytical methods: SW8015B

Work Order: 0909113

Lab ID	Client ID	Matrix	TPH-Diesel (C10-C23)	DF	% SS	Comments
0909113-042A	SB-3-8	S	ND	1	97	
0909113-043A	SB-3-12	S	15	1	94	e8/e1
0909113-044A	SB-3-20	S	ND	1	95	

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	1.0	mg/Kg

\* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

# cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract/matrix interference.

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b1) aqueous sample that contains greater than ~1 vol. % sediment  
e1) unmodified or weakly modified diesel is significant; and/or e8) kerosene/kerosene range/jet fuel range  
e1) unmodified or weakly modified diesel is significant; and/or e10) fuel oil  
e2) diesel range compounds are significant; no recognizable pattern  
e3) aged diesel is significant  
e7) oil range compounds are significant  
e8) kerosene/kerosene range/jet fuel range; and/or e1) unmodified or weakly modified diesel is significant





### QC SUMMARY REPORT FOR SW8260B

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 45592

WorkOrder 0909113

EPA Method SW8260B	Extraction SW5030B								Spiked Sample ID: 0909113-040A			
	Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)		
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
tert-Amyl methyl ether (TAME)	ND	10	91.2	99.2	8.37	94.9	93.2	1.78	70 - 130	30	70 - 130	30
Benzene	ND	10	106	114	6.78	114	115	1.12	70 - 130	30	70 - 130	30
t-Butyl alcohol (TBA)	ND	50	91.6	93.2	1.76	89.9	95.1	5.60	70 - 130	30	70 - 130	30
Chlorobenzene	ND	10	109	116	6.64	99.8	101	1.41	70 - 130	30	70 - 130	30
1,2-Dibromoethane (EDB)	ND	10	121	130	7.02	101	99.6	1.51	70 - 130	30	70 - 130	30
1,2-Dichloroethane (1,2-DCA)	ND	10	100	103	2.32	103	106	2.69	70 - 130	30	70 - 130	30
1,1-Dichloroethene	ND	10	101	98.9	1.62	110	109	0.808	70 - 130	30	70 - 130	30
Diisopropyl ether (DIPE)	ND	10	98	104	6.26	119	122	2.29	70 - 130	30	70 - 130	30
Ethyl tert-butyl ether (ETBE)	ND	10	96.7	104	7.26	108	110	1.35	70 - 130	30	70 - 130	30
Methyl-t-butyl ether (MTBE)	ND	10	105	108	3.32	107	104	2.14	70 - 130	30	70 - 130	30
Toluene	ND	10	108	116	7.13	106	108	1.22	70 - 130	30	70 - 130	30
Trichloroethene	ND	10	125	114	8.75	110	110	0	70 - 130	30	70 - 130	30
%SS1:	90	25	81	88	8.60	77	78	1.87	70 - 130	30	70 - 130	30
%SS2:	93	25	103	112	7.90	100	101	1.09	70 - 130	30	70 - 130	30
%SS3:	103	2.5	121	101	18.3	101	98	3.79	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
NONE

#### BATCH 45592 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
0909113-040A	09/02/09 9:30 AM	09/04/09	09/04/09 8:40 PM	0909113-041A	09/02/09 11:00 AM	09/05/09	09/05/09 1:01 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / ((MS + MSD) / 2).

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.  
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.



### QC SUMMARY REPORT FOR SW8015B

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 45580

WorkOrder 0909113

EPA Method SW8015B		Extraction SW3550C/3630C							Spiked Sample ID: 0909085-006A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH-Diesel (C10-C23)	ND	20	97.4	104	6.59	96.4	91.6	5.08	70 - 130	30	70 - 130	30
%SS:	102	50	104	108	4.23	103	98	4.84	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
NONE

#### BATCH 45580 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
0909113-001A	08/31/09 12:00 PM	09/03/09	09/09/09 3:54 AM	0909113-002A	08/31/09 12:05 PM	09/03/09	09/05/09 10:22 AM
0909113-004A	08/31/09 11:45 AM	09/03/09	09/05/09 12:06 AM	0909113-005A	08/31/09 11:00 AM	09/03/09	09/05/09 1:15 AM
0909113-008A	08/31/09 10:15 AM	09/03/09	09/05/09 2:23 AM	0909113-009A	08/31/09 10:05 AM	09/03/09	09/05/09 6:57 AM
0909113-010A	08/31/09 10:00 AM	09/03/09	09/10/09 3:23 PM	0909113-011A	08/31/09 9:25 AM	09/03/09	09/09/09 3:04 AM
0909113-012A	08/31/09 9:40 AM	09/03/09	09/05/09 4:03 PM	0909113-014A	09/01/09 10:20 AM	09/03/09	09/05/09 8:05 AM
0909113-015A	09/01/09 10:15 AM	09/03/09	09/05/09 9:13 AM	0909113-016A	09/01/09 10:23 AM	09/03/09	09/05/09 12:38 PM
0909113-017A	09/01/09 10:25 AM	09/03/09	09/05/09 1:47 PM	0909113-018A	09/01/09 11:10 AM	09/03/09	09/09/09 7:37 AM
0909113-019A	09/01/09 11:15 AM	09/03/09	09/05/09 2:55 PM	0909113-020A	09/01/09 11:17 AM	09/03/09	09/04/09 7:30 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



### QC SUMMARY REPORT FOR SW8015B

W.O. Sample Matrix: Soil

QC Matrix: Soil

BatchID: 45614

WorkOrder 0909113

Analyte	Extraction SW3550C/3630C								Spiked Sample ID: 0909113-043A			
	Sample mg/Kg	Spiked mg/Kg	MS % Rec.	MSD % Rec.	MS-MSD % RPD	LCS % Rec.	LCSD % Rec.	LCS-LCSD % RPD	Acceptance Criteria (%)			
TPH-Diesel (C10-C23)	16	20	72.3	70.9	0.903	88.2	88.4	0.269	70 - 130	30	70 - 130	30
%SS:	97	50	109	109	0	95	94	0.246	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
NONE

#### BATCH 45614 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
0909113-021A	09/01/09 11:20 AM	09/03/09	09/04/09 8:38 PM	0909113-022A	09/01/09 11:23 AM	09/03/09	09/04/09 9:46 PM
0909113-023A	09/01/09 11:25 AM	09/03/09	09/09/09 6:01 PM	0909113-024A	09/01/09 11:30 AM	09/03/09	09/09/09 7:09 PM
0909113-025A	09/01/09 7:55 AM	09/03/09	09/05/09 5:12 PM	0909113-027A	09/01/09 8:05 AM	09/03/09	09/08/09 11:39 PM
0909113-029A	09/01/09 8:15 AM	09/03/09	09/05/09 8:05 AM	0909113-030A	09/01/09 8:20 AM	09/03/09	09/05/09 9:13 AM
0909113-032A	09/01/09 8:30 AM	09/03/09	09/09/09 2:45 AM	0909113-034A	09/02/09 8:15 AM	09/03/09	09/09/09 1:37 AM
0909113-035A	09/02/09 8:17 AM	09/03/09	09/05/09 1:47 PM	0909113-036A	09/02/09 8:20 AM	09/03/09	09/05/09 2:55 PM
0909113-042A	09/02/09 10:15 AM	09/03/09	09/05/09 8:36 PM	0909113-043A	09/02/09 10:17 AM	09/03/09	09/09/09 5:10 PM
0909113-044A	09/02/09 10:25 AM	09/03/09	09/05/09 9:45 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



### QC SUMMARY REPORT FOR SW8015B

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 45579

WorkOrder 0909113

Analyte	EPA Method SW8015B		Extraction SW3510C/3630C						Spiked Sample ID: N/A			
	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH-Diesel (C10-C23)	N/A	1000	N/A	N/A	N/A	85.1	86.4	1.47	N/A	N/A	70 - 130	30
%SS:	N/A	2500	N/A	N/A	N/A	95	96	0.441	N/A	N/A	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
NONE

#### BATCH 45579 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
0909113-040B	09/02/09 9:30 AM	09/03/09	09/05/09 4:03 PM	0909113-041B	09/02/09 11:00 AM	09/03/09	09/04/09 10:55 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



**McC Campbell Analytical, Inc.**

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701  
Web: www.mcccampbell.com E-mail: main@mcccampbell.com  
Telephone: 877-252-9262 Fax: 925-252-9269

Pangea Environmental Svcs., Inc.  1710 Franklin Street, Ste. 200  Oakland, CA 94612	Client Project ID: #1320.001; FCI - Dublin	Date Sampled: 09/17/09
		Date Received: 09/17/09
	Client Contact: Morgan Gillies	Date Reported: 09/23/09
	Client P.O.:	Date Completed: 09/21/09

**WorkOrder: 0909512**

September 23, 2009

Dear Morgan:

Enclosed within are:

- 1) The results of the **3** analyzed samples from your project: **#1320.001; FCI - Dublin,**
- 2) A QC report for the above samples,
- 3) A copy of the chain of custody, and
- 4) An invoice for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing

McC Campbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius  
Laboratory Manager  
McC Campbell Analytical, Inc.

0909512

**McCAMPBELL ANALYTICAL, INC.**

1534 Willow Pass Road  
Pittsburg, CA 94565

Website: [www.mccampbell.com](http://www.mccampbell.com) Email: [main@mccampbell.com](mailto:main@mccampbell.com)  
Telephone: (925) 252-9262 Fax: (925) 252-9269

**CHAIN OF CUSTODY RECORD**  
**TURN AROUND TIME**

RUSH 24 HR 48 HR 72 HR 5 DAY

EDF Required? Coelt (Normal) No Write On (DW) No

Report To: Morgan Gillies Bill To: Pangea  
Company: Pangea Environmental Services, Inc.  
1710 Franklin Street, Suite 200, Oakland, CA 94612  
E-Mail: [mgillies@pangeaenv.com](mailto:mgillies@pangeaenv.com)  
Tele: (510) 836-3702 Fax: (510) 836-3709  
Project #: 1320.001 Project Name: FCI - Dublin  
Project Location: 5701 8<sup>th</sup> St., Dublin  
Sampler Signature: *[Signature]*

Analysis Request										Other	Comments															
SAMPLE ID	LOCATION (Field Point Name)	Date	Time	# Containers	Type Containers	MATRIX	METHOD PRESERVED	BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015) w/ Silica Gel Cleanup	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010 / 8021	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8081	EPA 608 / 8082 PCB's ONLY	EPA 8140 / 8141	EPA 8150 / 8151	EPA 524.2 / 624 / 8260	EPA 525 / 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals (6010 / 6020)	LUFT 5 Metals (6010 / 6020)	Lead (200.8 / 200.9 / 6010)	BTEX & Napthalene by EPA Method 8260	Filter Samples for Metals analysis: Yes / No	
MW-1	MW-1	7/2/09	1040	5	VOAS Amal	Water	ICE	X	X	X														X		
MW-2	MW-2	↓	935	↓	↓																			X		
MW-3	MW-3	↓	830	↓	↓																			X		

Relinquished By: *[Signature]* Date: 9/17/09 Time: 12:58 Received By: Envirotech DM  
Relinquished By: Enviro - Reh Date: 9/17 Time: 1710 Received By: *[Signature]*  
Relinquished By: *[Signature]* Date: 9/17 Time: 1738 Received By: *[Signature]*

ICE/r° 3.20  
GOOD CONDITION   
HEAD SPACE ABSENT   
DECHLORINATED IN LAB   
APPROPRIATE CONTAINERS   
PRESERVED IN LAB   
COMMENTS:  
VOAS O&G METALS OTHER  
PRESERVATION  pH<2

**McC Campbell Analytical, Inc.**



1534 Willow Pass Rd  
 Pittsburg, CA 94565-1701  
 (925) 252-9262

**CHAIN-OF-CUSTODY RECORD**

**WorkOrder: 0909512**

**ClientCode: PEO**

WaterTrax    WriteOn    EDF    Excel    Fax    Email    HardCopy    ThirdParty    J-flag

Report to: Morgan Gillies  
 Pangea Environmental Svcs., Inc.  
 1710 Franklin Street, Ste. 200  
 Oakland, CA 94612  
 (510) 836-3700   FAX (510) 836-3709

Email: mgillies@pangeaenv.com  
 cc:  
 PO:  
 ProjectNo: #1320.001; FCI - Dublin

Bill to: Bob Clark-Riddell  
 Pangea Environmental Svcs., Inc.  
 1710 Franklin Street, Ste. 200  
 Oakland, CA 94612

Requested TAT: **5 days**  
 Date Received: **09/17/2009**  
 Date Printed: **09/17/2009**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
0909512-001	MW-1	Water	9/17/2009 10:40	<input type="checkbox"/>	B	A											
0909512-002	MW-2	Water	9/17/2009 9:35	<input type="checkbox"/>	B	A											
0909512-003	MW-3	Water	9/17/2009 8:30	<input type="checkbox"/>	B	A											

**Test Legend:**

1	8260VOC_W	2	TPH(D)WSG_W	3		4		5	
6		7		8		9		10	
11		12							

**Prepared by: Shino Hamilton**

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).  
 Hazardous samples will be returned to client or disposed of at client expense.



**Sample Receipt Checklist**

Client Name: **Pangea Environmental Svcs., Inc.**

Date and Time Received: **9/17/2009 6:35:55 PM**

Project Name: **#1320.001; FCI - Dublin**

Checklist completed and reviewed by: **Shino Hamilton**

WorkOrder N°: **0909512** Matrix Water

Carrier: Derik Cartan (MAI Courier)

**Chain of Custody (COC) Information**

- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Sample IDs noted by Client on COC? Yes  No
- Date and Time of collection noted by Client on COC? Yes  No
- Sampler's name noted on COC? Yes  No

**Sample Receipt Information**

- Custody seals intact on shipping container/cooler? Yes  No  NA
- Shipping container/cooler in good condition? Yes  No
- Samples in proper containers/bottles? Yes  No
- Sample containers intact? Yes  No
- Sufficient sample volume for indicated test? Yes  No

**Sample Preservation and Hold Time (HT) Information**

- All samples received within holding time? Yes  No
- Container/Temp Blank temperature Cooler Temp: 3.2°C NA
- Water - VOA vials have zero headspace / no bubbles? Yes  No  No VOA vials submitted
- Sample labels checked for correct preservation? Yes  No
- TTLC Metal - pH acceptable upon receipt (pH<2)? Yes  No  NA
- Samples Received on Ice? Yes  No

(Ice Type: WET ICE )

\* NOTE: If the "No" box is checked, see comments below.

-----

Client contacted:

Date contacted:

Contacted by:

Comments:





# McC Campbell Analytical, Inc.

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701  
Web: www.mcccampbell.com E-mail: main@mcccampbell.com  
Telephone: 877-252-9262 Fax: 925-252-9269

Pangea Environmental Svcs., Inc.  1710 Franklin Street, Ste. 200  Oakland, CA 94612	Client Project ID: #1320.001; FCI - Dublin	Date Sampled: 09/17/09
	Client Contact: Morgan Gillies	Date Received: 09/17/09
	Client P.O.:	Date Analyzed: 09/18/09
		Date Extracted: 09/18/09

### Volatile Organics by P&T and GC/MS\*

Extraction Method: SW5030B

Analytical Method: SW8260B

Work Order: 0909512

Lab ID	0909512-001B	0909512-002B	0909512-003B		Reporting Limit for DF =1	
Client ID	MW-1	MW-2	MW-3			
Matrix	W	W	W			
DF	1	1	1			

Compound	Concentration				ug/kg	µg/L
Benzene	ND	ND	ND		NA	0.5
Ethylbenzene	ND	ND	ND		NA	0.5
Naphthalene	36	ND	ND		NA	0.5
Toluene	ND	ND	ND		NA	0.5
Xylenes	ND	ND	ND		NA	0.5

### Surrogate Recoveries (%)

%SS1:	89	89	90		
%SS2:	100	100	100		
%SS3:	100	96	93		

### Comments

\* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

# surrogate diluted out of range or surrogate coelutes with another peak.





**QC SUMMARY REPORT FOR SW8260B**

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 45891

WorkOrder 0909512

Analyte	Extraction SW5030B			Spiked Sample ID: 0909483-007b								
	Sample µg/L	Spiked µg/L	MS % Rec.	MSD % Rec.	MS-MSD % RPD	LCS % Rec.	LCSD % Rec.	LCS-LCSD % RPD	Acceptance Criteria (%)			
tert-Amyl methyl ether (TAME)	ND	10	90.6	88.3	2.52	91.2	100	9.14	70 - 130	30	70 - 130	30
Benzene	ND	10	94	91.2	2.99	103	120	15.0	70 - 130	30	70 - 130	30
t-Butyl alcohol (TBA)	ND	50	95.2	89.8	5.87	97.8	111	12.3	70 - 130	30	70 - 130	30
Chlorobenzene	ND	10	97.9	94.3	3.78	109	111	1.75	70 - 130	30	70 - 130	30
1,2-Dibromoethane (EDB)	ND	10	102	94.6	7.94	111	113	1.18	70 - 130	30	70 - 130	30
1,2-Dichloroethane (1,2-DCA)	ND	10	99.4	96.6	2.86	99.9	108	7.54	70 - 130	30	70 - 130	30
1,1-Dichloroethene	ND	10	108	105	2.79	101	116	14.2	70 - 130	30	70 - 130	30
Diisopropyl ether (DIPE)	ND	10	100	98	2.08	111	124	11.0	70 - 130	30	70 - 130	30
Ethyl tert-butyl ether (ETBE)	ND	10	98	93.5	4.64	103	113	9.34	70 - 130	30	70 - 130	30
Methyl-t-butyl ether (MTBE)	1.3	10	86.8	81.9	5.04	99.5	112	12.1	70 - 130	30	70 - 130	30
Toluene	ND	10	99.6	94.9	4.84	106	114	7.16	70 - 130	30	70 - 130	30
Trichloroethene	ND	10	102	99.3	2.66	108	118	9.29	70 - 130	30	70 - 130	30
%SS1:	78	25	70	73	3.93	76	77	0.891	70 - 130	30	70 - 130	30
%SS2:	100	25	104	102	2.36	97	95	1.59	70 - 130	30	70 - 130	30
%SS3:	94	2.5	94	94	0	99	98	1.26	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
NONE

BATCH 45891 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
0909512-001B	09/17/09 10:40 AM	09/18/09	09/18/09 3:05 PM	0909512-002B	09/17/09 9:35 AM	09/18/09	09/18/09 1:38 PM
0909512-003B	09/17/09 8:30 AM	09/18/09	09/18/09 2:21 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / ((MS + MSD) / 2).

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.



### QC SUMMARY REPORT FOR SW8015B

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 45917

WorkOrder 0909512

EPA Method SW8015B		Extraction SW3510C/3630C							Spiked Sample ID: N/A			
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH-Diesel (C10-C23)	N/A	1000	N/A	N/A	N/A	85.7	84.2	1.77	N/A	N/A	70 - 130	30
%SS:	N/A	2500	N/A	N/A	N/A	82	81	0.517	N/A	N/A	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
NONE

#### BATCH 45917 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
0909512-001A	09/17/09 10:40 AM	09/17/09	09/20/09 12:10 AM	0909512-002A	09/17/09 9:35 AM	09/17/09	09/20/09 1:18 AM
0909512-003A	09/17/09 8:30 AM	09/17/09	09/20/09 3:35 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery =  $100 * (MS - Sample) / (Amount\ Spiked)$ ; RPD =  $100 * (MS - MSD) / ((MS + MSD) / 2)$ .

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.