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DATE: February 16, 2012

TO: Jeff Catanzarita, U.S. EPA/ERT Work Assignment Manager

FROM: Jon McBurney, SERAS Project Engineer/Task Leader

THROUGH: Dennis Miller, SERAS Program Manager

SUBJECT: TRIP REPORT – SOIL GAS INVESTIGATION
CABO ROJO SITE – June 13 – 17, 2011
Work Assignment No.: SERAS-130

PURPOSE

The purpose of this Trip Report is to detail the actions, observations and results of activities performed by Lockheed Martin Scientific, Engineering, Response and Analytical Services (SERAS) personnel at the Cabo Rojo Site (Site) in Cabo Rojo, Puerto Rico (PR). SERAS was tasked by the Environmental Protection Agency/Environmental Response Team (EPA/ERT) and EPA Region II to conduct a preliminary remedial investigation (RI) of the site to confirm or negate possible sources of groundwater contamination based on previous EPA findings and/or suspected sources of contaminants.

BACKGROUND

The Site consists of a groundwater plume that has impacted several public drinking water supply wells in and around the municipality of Cabo Rojo, PR. The source of the plume has not been identified. Samples collected by the Puerto Rico Aqueduct and Sewer Authority (PRASA) from 2002 to 2006 have identified the presence of tetrachloroethene (PCE), trichloroethene (TCE), cis 1,2-dichloroethene (DCE) and 1,1-dichloroethene within the Cabo Rojo Urbano System, particularly in the Ana Maria well. EPA confirmed the presence of these contaminants in the Ana Maria well in 2007, and began site reconnaissance activities that included 68 facilities in and around Cabo Rojo. Preliminary Assessment/Site Inspections (PA/SI) were completed at fifteen facilities, 13 of which included soil and groundwater sampling. Although the source of the groundwater contamination was not specifically identified, contamination was detected at D'Elegant Fantastic Dry Cleaners, Extasy Q Prints, and Cabo Rojo Professional Dry Cleaners. The Site was listed on the National Priorities List on March 10, 2011 (US EPA 2012).

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SITE ACTIVITIES

During the week of June 13, 2011 SERAS personnel mobilized to the site to begin the remedial investigation. A list of facilities considered to be possible sources for the groundwater plume that had been given to ERT/SERAS by the Region 2 On-Scene Coordinator (OSC) prior to mobilization was used to plan the sampling strategy. Documentation regarding site access is included in Appendix A. The properties included in this study are:

1. Acevedo Cleaners (AC)	Rius St. corner Mestre St.
2. D'Elegant Cleaners (DEC)	Road 307 Intersection 100
3. Acosta/Robert/Seda/Ojeda/Orria (CC)	64 Salvador Brau St.
4. Cabo Rojo Professional Dry Cleaners (CRPDC)	50 and 52 Carbonell St.
5. Eaton Cutler Hammer Electrical Co.(EC)	Fomento St. and Road 103
6. Extasy Q Prints (EQP)	Urb. Borinquen #D4
7. Bank Parking Lot (SB)	Carbonell St.
8. Robert's Steam Laundry (RSL)	32 Salvador Brau St.
9. Robert's Cleaners (RC)	33 Barbosa Ave.
10. PRIDCO Industrial Park (PIP)	Fomento St. and Road 103
11. Reto (R)	Fomento St. and Road 103
12. Serrano Dry Cleaners I (S1)	70 Salvador Brau St.
13. Serrano Dry Cleaners II (S2)	17 ext. Carbonell St.

All properties are shown in Figure 1a. Municipal wells and wetland areas are shown in relation to the sampled properties on Figure 1b.

In order to maximize the coverage area and sampling effort, it was determined that soil gas sampling was the most efficient method of confirming and/or locating a source area. By collecting soil gas and analyzing the samples in the field on a Voyager field portable gas chromatograph (GC), adjustments could be made in the field to better identify source areas.

A SERAS field chemist, under an agreement between EPA and the United States Fish and Wildlife Services (FWS), set up a secure, controlled-environment field laboratory at the Cabo Rojo National Wildlife Reserve offices, located approximately 15 minutes south of the Site.

Sampling Method. At each property selected for investigation, sample locations were chosen by discussions with the Region 2 OSC and the ERT Work Assignment Manager (WAM) using information collected during previous site activities. Outdoor sample locations were marked, recorded using Global Positioning System (GPS) equipment and cleared for drilling using subsurface geophysical techniques. All locations were cleared by a SERAS subcontractor, GeoEnvirotech, using a combination of electro-magnetic (EM) and ground penetrating radar (GPR) techniques.

For outdoor sample locations, samples were collected using either direct push (Geoprobe^{TM}) or slam-bar methodology as per SERAS Standard Operating Procedure (SOP) #2042, *Soil Gas Sampling*. For direct push samples, the Geoprobe Post Run Tubing (PRT) system was utilized by GeoEnvirotech to create the sample point. For PRT sampling, a disposable point was installed on a PRT expendable point holder on the drive rod. The rod was then driven to the desired depth and retracted several inches to disengage the expendable point. A length of Teflon tubing was attached to a PRT adapter and fed down the drive rod, where the PRT adapter was screwed securely to the expendable point holder.

For locations collected using a slam-bar, a small diameter solid rod was driven to the required depth using an integrated sliding weight. Once the depth had been achieved, the bar was carefully removed, and a specially fabricated length of Teflon tubing was inserted into the hole and a small amount of clay was used to seal the tubing in the hole.

For indoor or sub-slab locations, soil gas wells were installed using a masonry drill and pre-fabricated soil gas wells per SERAS SOP #2082, *Construction and Installation of Permanent Sub-Slab Soil Gas Wells*. A hole was drilled through the slab, a well was inserted into the hole using a small amount of clay as a seal, and then the well was fixed in place with a small amount of cement. Teflon tubing with a special adapter was then threaded into the well 24 hours later after the cement had cured.

Samples were then collected from each type of port per SERAS SOP #2102, *Tedlar Bag Sampling* as follows. The installed Teflon tubing was first connected to a MultiRAE multi-gas meter and pumped for several minutes until steady state readings were noted. The VOC reading from the MultiRAE as well as the sample number and well depth were then recorded on a field Tedlar Bag Sampling Worksheet. The tubing was then connected to a specially constructed vacuum box containing a clean, labeled, 1-Liter (L) Tedlar bag. The box was then connected to an SKC battery-operated air pump for a minimum of two minutes or until the Tedlar bag inside the vacuum box was full. The Tedlar bag was then placed into a dark container and delivered to the field laboratory for analysis.

At two locations, a SUMMA canister sample was collected for laboratory verification at the ERT/SERAS Laboratory in Edison, NJ as per SERAS SOP #1704, *Summa Canister Sampling.* The SUMMA canister samples were shipped to the ERT/SERAS laboratory and analyzed per EPA Method TO-15.

At the completion of sample collection, all direct push locations were sealed with bentonite and patched as necessary with concrete or blacktop patch. All indoor locations were sealed with a threaded plug.

RESULTS

The analytical results from this investigation indicate that there are measurable levels of PCE, TCE, and DCE at four of the 13 properties included in this investigation. The results from each location are detailed in Table 1 and discussed briefly below. The GPS coordinates for all sample locations are listed in Table 2. Photodocumentation of site activities is included as Appendix B. All completed Tedlar Bag Sampling Worksheets are attached in Appendix C. A brief field Photovac Voyager Operating Procedure is included as Appendix D. The preliminary analytical report for the confirmation samples is included in Appendix E, and a comparison of the confirmation results with the field results is detailed below.

Acevedo Cleaners (AC) (Figure 1) – No contamination was found in two indoor sub-slab samples.

Robert's Cleaners (RC) (Figure 1) – No contamination was found in one indoor sub-slab sample.

Robert's Steam Laundry (RSL) (Figure 1) – No contamination was found in one indoor sub-slab sample.

D'Elegant Cleaners (DEC) (Figure 2) – The DEC property was noted in the EPA PA/SI to contain levels of PCE, TCE and DCE that could be contributing to the groundwater contamination. The current site has been redeveloped and is now a Walgreen's Pharmacy. Figure 2 shows the location of the previous building as well as the approximate location of the new pharmacy building based on the drawing in Appendix E. DEC was the southernmost business in the original building. Sample locations were chosen to better locate the possible source of the contamination found during the PA/SI. Based on the soil gas results, there would seem to be a source area near sample DEC-05 as indicated by the estimated 50,200 parts per billion by volume (ppbv) of DCE. The other results from DEC-07 (approximately 850 ppbv DCE) and DEC-08 (approximately 980 ppbv DCE) seem to indicate that the contamination is moving to the east.

Acosta/Robert/Seda/Ojeda/Orria (CC) (Figure 3) – This property consists of several retail businesses including a clothing store, an empty store, a Church's Fried Chicken, and a funeral home. Two outdoor samples and two indoor samples were non-detect for PCE, TCE and DCE.

Serrano Dry Cleaners I (S1) (Figure 3) – No contamination was found in three samples collected at this property.

Cabo Rojo Professional Dry Cleaners (CRPDC) (Figure 4) – The PA/SI for this property noted the presence of PCE and TCE. Sample locations were chosen to surround the property to better locate the source. Results from indoor sub-slab sample CRPDC-I01 indicate the presence of PCE at approximately 64,700 ppbv. A co-located SUMMA sample contained 100,000 ppbv PCE (678,000 micrograms per cubic meter [$\mu g/m^3$]. The construction of the building is such that there is a crawl space beneath the concrete floor. Observations from the sampling personnel indicated that it was believed that the floor of the crawlspace was also concrete. This was confirmed by discussions with the OSC. The buildings in that area had been rebuilt after a flood and raised several feet to be above flood levels. Both other sub-slab samples, CRPDC-I02 and CRPDC-I03, collected from inside the building also contained PCE at approximately 4,870 and 9,200 ppbv respectively. A sample collected from beneath the sidewalk in the alleyway between the dry cleaners and the adjacent property to the east, CRPDC-I04 also contained high levels of PCE at approximately 25,700 ppbv. It is not known at this time if the crawlspace continued beneath multiple properties, or if the contamination has migrated outside the facility into the surrounding pore space. Samples to the west of the building CRPDC-03 and CRPDC-04 were non-detect for PCE, TCE and DCE. CRPDC-01, located in the northeastern corner of the parking lot, could not be sampled due to a significant amount of an oily residue in the subsurface soils.

Bank Parking Lot (SB) (Figure 4) – No contamination was found in four samples collected at this property.

Eaton-Cutler (EC) (Figure 5) – No contamination was found in four samples collected at this property.

Puerto Rico Industrial Development Company (PRIDCO) Industrial Park (PIP) (Figure 5) – Twenty-nine soil gas samples were collected from the PIP property. Of the 29, only 2, PIP-07 and PIP-13 contained contamination, 23 ppbv and 42 ppbv DCE respectively. PIP-07 and PIP-13 were both collected adjacent to properties formally used by Eaton Cutler.

Reto (R) (Figure 5) – This property is across the street from the PRIDCO property. No contamination was found in seven samples.

Extasy Q-Prints (EQP) (Figure 6) – This property contains a T-shirt printing operation to the south and a children's day care facility to the north. The east side of the building is an open air covered area where much of the cleaning and washing of the printing equipment occurs. Contamination was noted in sub-slab samples collected under the covered area in samples EQP-I02 (330 ppbv PCE) and EQP-I03 (approximately 980 ppbv PCE).

Results from the sub-slab sampling performed in one of the day care classrooms, sample EQP-I01, indicate the presence of PCE (approximately 4,970 ppbv), TCE (83 ppbv) and DCE (50 ppbv) in the vapor space under the floor. Sample EQP-03, located in the playground north of the daycare, contained 239 ppbv TCE.

Samples collected from the parking lot of the adjacent police station, EQP-06 and EQP-07 contained lower levels of TCE, 93 and 99 ppbv respectively. Sample EQP-05, also located in the parking lot, contained 430 ppbv of PCE. At this time, indications are that the PCE, TCE and DCE present under EQP may be moving to the north and east.

Late in the day on June 14, a noticeable solvent odor was reported by the sampling personnel inside the printing shop. An indoor air sample was scheduled for the following day. When the sample was collected the following morning, the samplers noted that the solvent odor was less than the previous day. Results from the indoor air sample, EQP-IA, contained 103 ppbv of PCE.

Serrano Dry Cleaners II (S2) (Figure 7) – This property is no longer a dry cleaner and the dry cleaning area is now being used as storage. The second story contains residential housing. Contamination was found to the north and to the east of the building. Samples S2-01 and S2-02 to the east contain 20 ppbv and approximately 1,700 ppbv PCE respectively. Sample S2-03 contained approximately 2,500 ppbv PCE and 91 ppbv TCE. No contamination was detected in the indoor sub-slab sample collected in the storage area. No contamination was detected in two samples to the north and west of the building.

Comparison of Field Screening Data with Confirmation Samples

Field screening data was verified by the collection of two SUMMA canister samples that were shipped to the ERT/SERAS Laboratory in Edison, NJ for analysis by TO-15. The results were as follows:

Location	Analyte	Field Screening Data	TO-15 Analysis	
		ppbv	ppbv	$\mu g/m^3$
PIP-14	PCE	U (<10)	0.151	1.03
	TCE	U (<10)	U (<0.03)	U (<0.161)
	DCE	U (<10)	U (<0.03)	U (<0.119)
CRPDC-I01	PCE	64,700E	100,000	681,000
	TCE	58	57.2	308
	DCE	U (<10)	U (<0.15)	U (<0.607)

E- Estimated, value above calibration range.

CONCLUSIONS

Through the use of soil gas sampling and on-site analysis, the three previously detected possible sources, CRPDC, DEC and EQP were confirmed, two properties were added to the list of possible contributors, S2 and PIP (PIP-07 and PIP-13), and the eight remaining properties were eliminated as possible sources. It remains unclear which property has impacted the municipal groundwater wells.

The CRPDC property in 2006 was an operating dry cleaning facility. By the time this investigation began, all operations had ceased, and the facility was vacant. Soil samples collected in 2006 during the PA/SI indicated low levels of PCE in soils (23 micrograms per kilogram [µg/kg] and 29 µg/kg) found at the rear of the building under a covered porch. No sampling was performed inside the building in 2006. In comparison, sub-slab vapor results (64,700 ppbv) and confirmation results (100,000 ppbv) from this sampling event seem to indicate contamination under the foundation that was not found during the previous investigation.

The contamination found at the EQP location is of primary concern due to the proximity of the contamination to the children's day care facility. The soil gas results indicate that there is indeed contamination in the vapor space below the foundation, and also in the vapor space in the playground to the north of the building. Further investigation is necessary to fully evaluate the possible impacts of the subsurface contamination.

The contamination found at the PRIDCO property in PIP-07 and PIP-13 requires further investigation. The buildings near the sampling locations were utilized by Eaton Cutler, and solvents were used in their daily activities.

Further investigation of the five contaminated properties, including groundwater and soil sampling, is required to characterize the source areas and determine the possible impacts to the local groundwater. Two properties were identified during the investigations that were not sampled due to time constraints. The two properties, both owned by PRIDCO, should be investigated.

REFERENCES

"NPL Site Narrative for Cabo Rojo Ground Water Contamination | National Priorities List (NPL) | US EPA." *US Environmental Protection Agency*. Web. 11 Jan. 2012. <http://www.epa.gov/superfund/sites/npl/nar1823.htm>.

Weston Solutions Region 2 Site Assessment Team 2 (SAT2 2007a). Preliminary Assessment/Site Inspection Report - D'Elegant Fantastic Dry Cleaners, Cabo Rojo, PR. Document Control No. SAT2.20113.066.577. October 2007

Weston Solutions Region 2 Site Assessment Team 2 (SAT2 2007b). Site Inspection Report - Extasy Q Prints, Cabo Rojo, PR. Document Control No. SAT2.20113.070.597. December 2007

Weston Solutions Region 2 Site Assessment Team 2 (SAT2 2007c). Site Inspection Report – Cabo Rojo Professional Dry Cleaners, Cabo Rojo, PR. Document Control No. SAT2.20113.067.581. October 2007

TABLES

Cabo Rojo Site

February 2012

Table 1
Soil Vapor Field Analysis Results from June 14 - 18, 2011 Sampling Event
Cabo Rojo Site, Cabo Rojo, PR
February 2012

Property	Sample Location	DCE ppbv	TCE ppbv	PCE ppbv
D'Elegant Cleaners (DEC)	DEC-01	U	U	U
	DEC-02	U	U	U
	DEC-03	U	U	U
	DEC-04	U	U	U
	DEC-05	50200 E	410	420
	DEC-06	39	U	U
	DEC-07	850 E	U	U
	DEC-08	980 E	220	430
	DEC-I01	U	U	U
	DEC-I02	U	U	U
Acevado Cleaners (AC)	AC-I01	U	U	U
	AC-I02	U	U	U
Acosta /Robert/ Seda/Ojeda/ Orria (CC)	CC-01	U	U	U
	CC-02	U	U	U
	CC-I01	U	U	U
	CC-I03	U	U	U
Cabo Rojo Professional Dry Cleaners (CRPDC)	CRPDC-02	U	27	U
	CRPDC-03	U	U	U
	CRPDC-04	U	U	U
	CRPDC-I01	U	58	64700 E
	CRPDC-I02	U	32	4870 E
	CPRDC-I03	U	113	9200 E
	CRPDC-I04	U	25	25700 E
	CRPDC-I04D	U	23	24100 E
Eaton Cutler Hammer Electrical Co. (EC)	EC-01	U	U	U
	EC-02	U	U	U
	EC-03	U	U	U
	EC-04	U	U	U
Extasy Q-Prints (EQP)	EQP-01	U	U	U
	EQP-02	U	U	U
	EQP-03	U	239	U
	EQP-04	U	U	U
	EQP-05	U	U	430
	EQP-06	U	93	U
	EQP-07	U	99	U
	EQP-I01	50	83	4970 E
	EQP-I01D	51	83	5000 E
	EQP-I02	U	U	330
	EQP-I03	1700 E	190	980 E
	EQP-IA	U	U	103
Bank Parking Lot (SB)	SB-01	U	U	U
	SB-02	U	U	U
	SB-03	U	U	U
	SB-04	U	U	U
Robert's Cleaners (RC)	RC-I01	U	U	U
Robert's Steam Laundry (RSL)	RSL-I01	U	U	U

Property	Sample Location	DCE ppbv	TCE ppbv	PCE ppbv
PRIDCO Industrial Park (PIP)	PIP-01	U	U	U
	PIP-01D	U	U	U
	PIP-02	U	U	U
	PIP-03	U	U	U
	PIP-04	U	U	U
	PIP-05	U	U	U
	PIP-06	U	U	U
	PIP-07	23	U	U
	PIP-08	U	U	U
	PIP-09	U	U	U
	PIP-10	U	U	U
	PIP-11	U	U	U
	PIP-12	U	U	U
	PIP-13	42	U	U
	PIP-14	U	U	U
	PIP-15	U	U	U
	PIP-16	U	U	U
	PIP-17	U	U	U
	PIP-18	U	U	U
	PIP-19	U	U	U
	PIP-20	U	U	U
	PIP-21	U	U	U
	PIP-22	U	U	U
	PIP-23	U	U	U
	PIP-25	U	U	U
	PIP-26	U	U	U
	PIP-27	U	U	U
	PIP-28	U	U	U
	PIP-29	U	U	U
Reto (R)	R-01	U	U	U
	R-02	U	U	U
	R-03	U	U	U
	R-04	U	U	U
	R-05	U	U	U
	R-06	U	U	U
	R-07	U	U	U
Serrano I (S1)	S1-01	U	U	U
	S1-02	U	U	U
	S1-03	U	U	U
Serrano II (S2)	S2-01	U	U	20
	S2-02	U	120	1700 E
	S2-03	U	91	2500 E
	S2-04	U	U	U
	S2-05	U	U	U
	S2-I01	U	U	U

E- Estimated, ppbv - parts per billion by volume, U - Not detected above Minimum Detection Limit (MDL) of 10 ppbv

Table 2
Sample Location GPS Coordinates From June 14 -18, 2011 Sampling Event
Cabo Rojo Site, Cabo Rojo, PR
February 2012

Property	Sample Location	Latitude	Longitude
D'Elegant Cleaners (DEC)	DEC-01	18.0801	-67.1563
	DEC-02	18.0802	-67.1565
	DEC-03	18.0800	-67.1568
	DEC-04	18.0797	-67.1566
	DEC-05	18.0798	-67.1565
	DEC-06	18.0798	-67.1564
	DEC-07	18.0799	-67.1563
	DEC-08	18.0798	-67.1562
Acosta/Robert/Seda/ Ojeda/Orria (CC)	CC-01	18.0855	-67.1471
	CC-02	18.0855	-67.1472
Cabo Rojo Professional Dry Cleaners (CRPDC)	CRPDC-02	18.0885	-67.1479
	CRPDC-03	18.0884	-67.1479
	CRPDC-04	18.0884	-67.1479
Eaton Cutler Hammer Electrical Co. (EC)	EC-01	18.0778	-67.1524
	EC-02	18.0776	-67.1524
	EC-03	18.0775	-67.1529
	EC-04	18.0778	-67.1529
Extasy Q Prints (EQP)	EQP-01	18.0900	-67.1466
	EQP-02	18.0902	-67.1466
	EQP-05	18.0901	-67.1463
	EQP-06	18.0900	-67.1463
	EQP-07	18.0899	-67.1463
PRIDCO Industrial Park (PIP)	PIP-01	18.0783	-67.1533
	PIP-02	18.0785	-67.1534
	PIP-03	18.0785	-67.1535
	PIP-04	18.0787	-67.1535
	PIP-05	18.0787	-67.1534
	PIP-06	18.0783	-67.1530
	PIP-07	18.0786	-67.1530
	PIP-08	18.0791	-67.1530
	PIP-09	18.0785	-67.1525
	PIP-10	18.0786	-67.1526
	PIP-11	18.0782	-67.1523
	PIP-12	18.0784	-67.1523
	PIP-13	18.0791	-67.1524

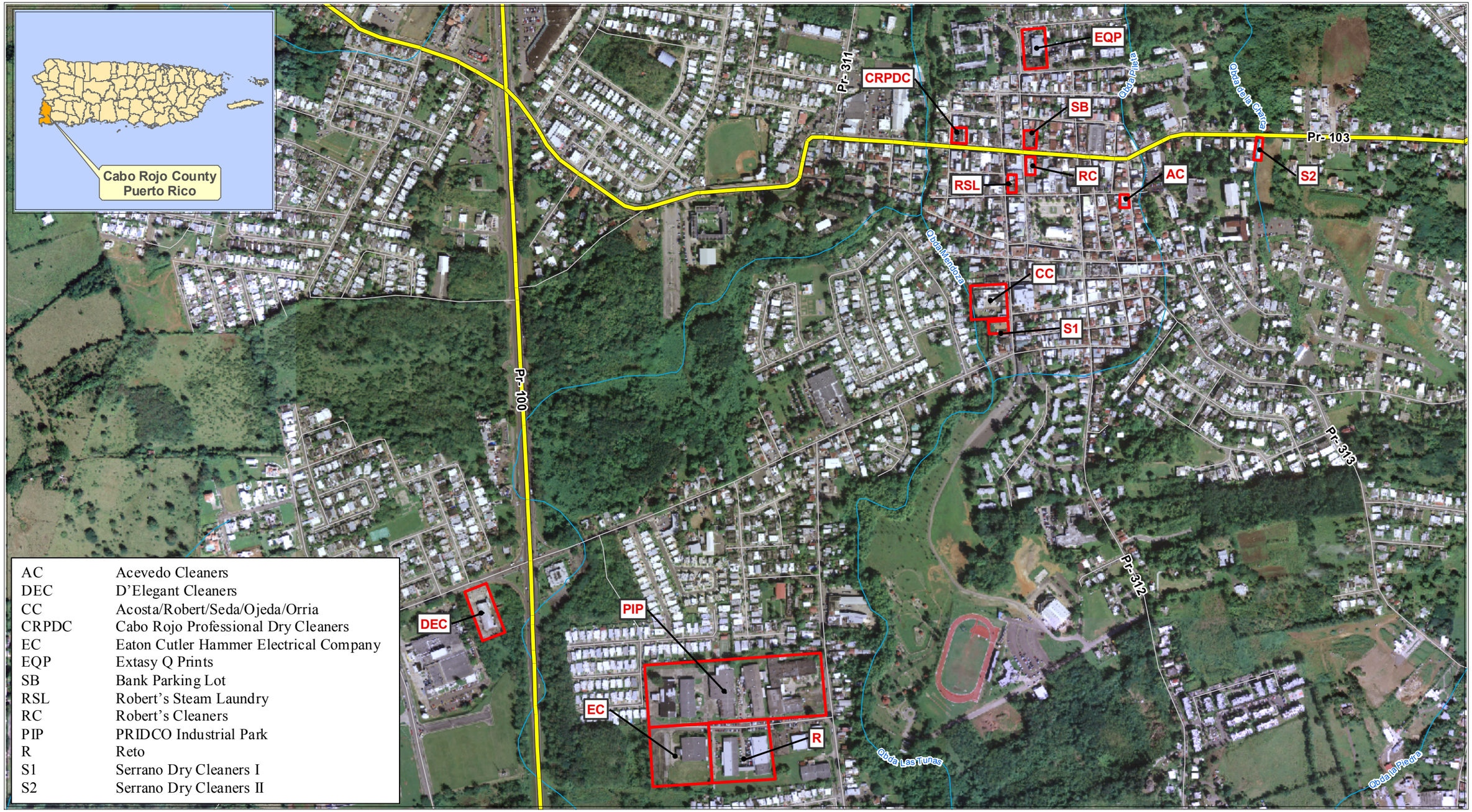
Property	Sample Location	Latitude	Longitude
PRIDCO Industrial Park (PIP)	PIP-14	18.0784	-67.1517
	PIP-15	18.0785	-67.1518
	PIP-16	18.0788	-67.1518
	PIP-17	18.0790	-67.1519
	PIP-18	18.0786	-67.1514
	PIP-19	18.0787	-67.1513
	PIP-20	18.0788	-67.1513
	PIP-21	18.0790	-67.1513
	PIP-22	18.0792	-67.1514
	PIP-23	18.0793	-67.1509
	PIP-25	18.0789	-67.1505
	PIP-26	18.0789	-67.1509
	PIP-27	18.0788	-67.1510
	PIP-28	18.0783	-67.1509
	PIP-29	18.0791	-67.1535
Reto (R)	R-01	18.0778	-67.1513
	R-02	18.0774	-67.1512
	R-03	18.0772	-67.1516
	R-04	18.0773	-67.1518
	R-05	18.0772	-67.1523
	R-06	18.0776	-67.1523
	R-06	18.0776	-67.1523
	R-07	18.0780	-67.1520
Serrano Dry Cleaners I (S1)	S1-01	18.0852	-67.1470
	S1-02	18.0851	-67.1471
	S1-03	18.0851	-67.1471
Serrano Dry Cleaners II (S2)	S2-01	18.0883	-67.1423
	S2-02	18.0883	-67.1423
	S2-03	18.0884	-67.1423
	S2-04	18.0884	-67.1424
	S2-05	18.0883	-67.1424
Bank Parking Lot (SB)	SB-01	18.0884	-67.1466
	SB-02	18.0883	-67.1466
	SB-03	18.0884	-67.1465
	SB-04	18.0883	-67.1465

Latitude/Longitude datum WGS 1984

FIGURES

Cabo Rojo Site

February 2012



Map created using 2006 high resolusion otthoimagery data from USGS, road data, site survey GPS data.
GPS data collected in Lat., Log., decimal degree. WGS 84

Map Creation Date: 1 July 2011

Coordinate system: Puerto Rico State Plane
FIPS: FIPS 5200
Datum: NAD83
Units: Feet

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MXD file: g:\ArcInfoProjects\SERAS01\SER00130_Cabo_Rojo_PR\130_TR_Site_Area_Location_Map_f1a

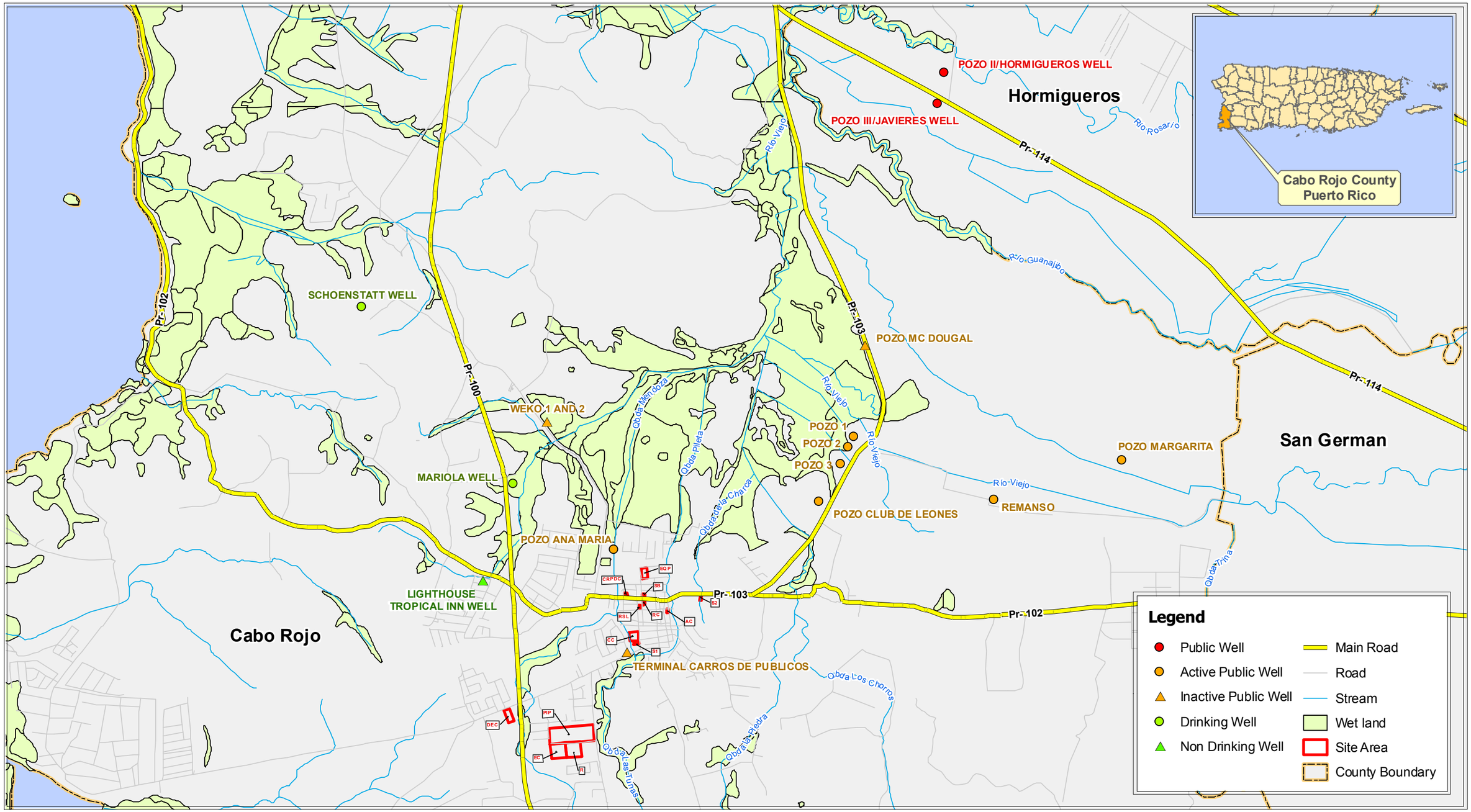
N
W E
S
Magnetic North

Legend

- Main Road
- Stream
- Road
- Site Area

600 0 600
Feet

U.S EPA Environmental Response Team Scientific Engineering Response and Analytical Services EP-W-09-031 W.A.# 0-130	Figure 1a Site Area Location Map Cabo Rojo Puerto Rico



Map created using 2006 high resolusion otthoimagery data from USGS, road data, site survey GPS data.
GPS data collected in Lat., Log., decimal degree. WGS 84

Map Creation Date: 1 July 2011

Coordinate system: Puerto Rico State Plane
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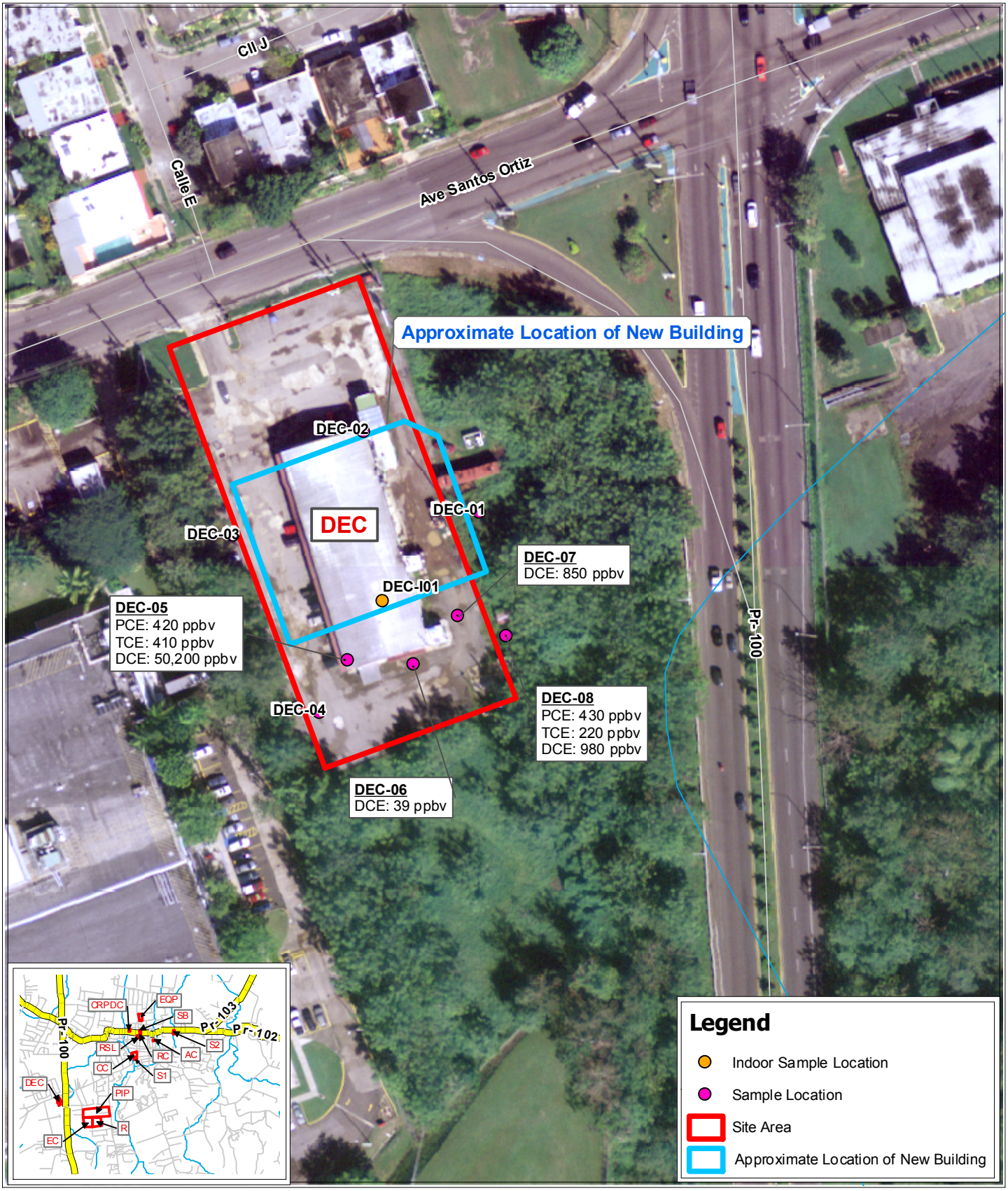
N
W E
S
Magnetic North

2,400 0 2,400
Feet

U.S EPA Environmental Response Team Scientific Engineering Response and Analytical Services EP-W-09-031 W.A.# 0-130	Figure 1b Site Area Location Map Cabo Rojo Puerto Rico



Map created using 2006 high resolusion otthoimagery data from USGS, road data, site survey GPS data.
GPS data collected in Lat., Log., decimal degree. WGS 84

Map Creation Date: 13 July 2011

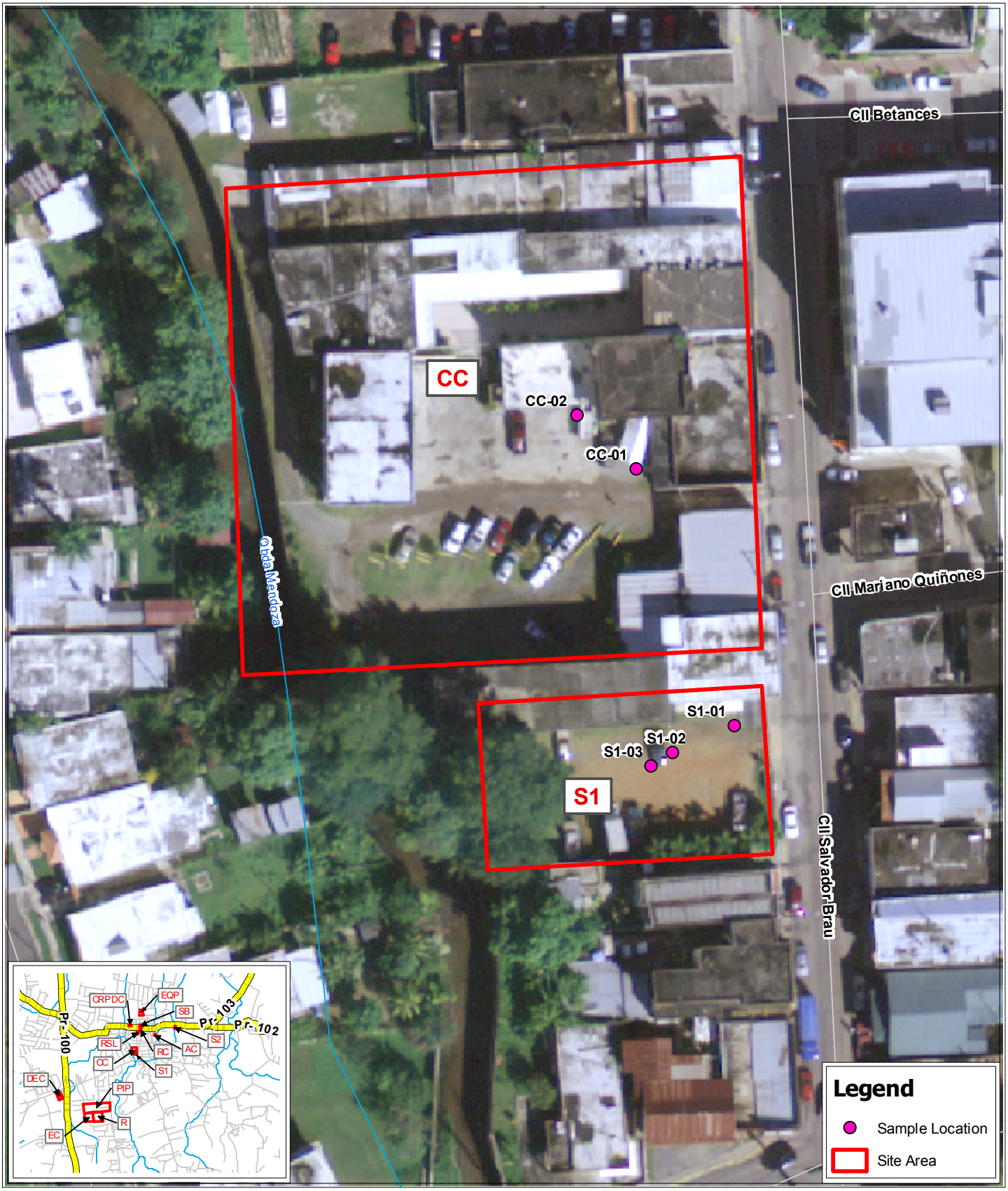
Coordinate system: Puerto Rico State Plane
FIPS: FIPS 5200
Datum: NAD83
Units: Feet

N W E S Magnetic North

100 0 100 Feet

Data: g:\arcviewprojects\SERAS01\00-130
MXD file: g:\ArcInfoProjects\SERAS01\SER00130_Cabo_Rojo_PR\130_TR_Sample_Location_at_DEC_Area_f2

U.S EPA Environmental Response Team Scientific Engineering Response and Analytical Services EP-W-09-031 W.A.# 0-130	Figure 2 Sample Location at DEC Area Cabo Rojo Puerto Rico



Map created using 2006 high resolusion otthoimagery data from USGS, road data, site survey GPS data.
GPS data collected in Lat., Log., decimal degree. WGS 84

Map Creation Date: 13 July 2011

Coordinate system: Puerto Rico State Plane
FIPS: FIPS 5200
Datum: NAD83
Units: Feet

N W E S Magnetic North

60 0 60 Feet

Data: g:\arcviewprojects\SERAS01\00-130
MXD file: g:\ArcInfoProjects\SERAS01\SER00130_Cabo_Rojo_PR\130_TR_Sample_Location_at_CC_S1_Area_f3

U.S EPA Environmental Response Team Scientific Engineering Response and Analytical Services EP-W-09-031 W.A.# 0-130	Figure 3 Sample Location at CC & S1 Area Cabo Rojo Puerto Rico

Map created using 2006 high resolusion otthoimagery data from USGS, road data, site survey GPS data.
GPS data collected in Lat., Log., decimal degree. WGS 84

Map Creation Date: 13 July 2011

Coordinate system: Puerto Rico State Plane
FIPS: FIPS 5200
Datum: NAD83
Units: Feet

N
W E
S
Magnetic North

Legend

- Indoor Sample Location
- Sample Location
- Site Area

50 0 50
Feet

U.S EPA Environmental Response Team Scientific Engineering Response and Analytical Services EP-W-09-031 W.A.# 0-130	Figure 4 Sample Location at CRPDC & SB Area Cabo Rojo Puerto Rico

Data: g:\arcviewprojects\SERAS01\00-130
MXD file: g:\ArcInfoProjects\SERAS01\SER00130_Cabo_Rojo_PR\130_TR_Sample_Location_at_CRPDC_SB_Area_f4

Map created using 2006 high resolusion otthoimagery data from USGS, road data, site survey GPS data.
GPS data collected in Lat., Log., decimal degree. WGS 84

Map Creation Date: 13 July 2011

Coordinate system: Puerto Rico State Plane
FIPS: FIPS 5200
Datum: NAD83
Units: Feet

Data: g:\arcviewprojects\SERAS01\00-130
MXD file: g:\ArcInfoProjects\SERAS01\SER00130_Cabo_Rojo_PR\130_TR_Sample_Location_at_PIP_EC_R_Area_f5

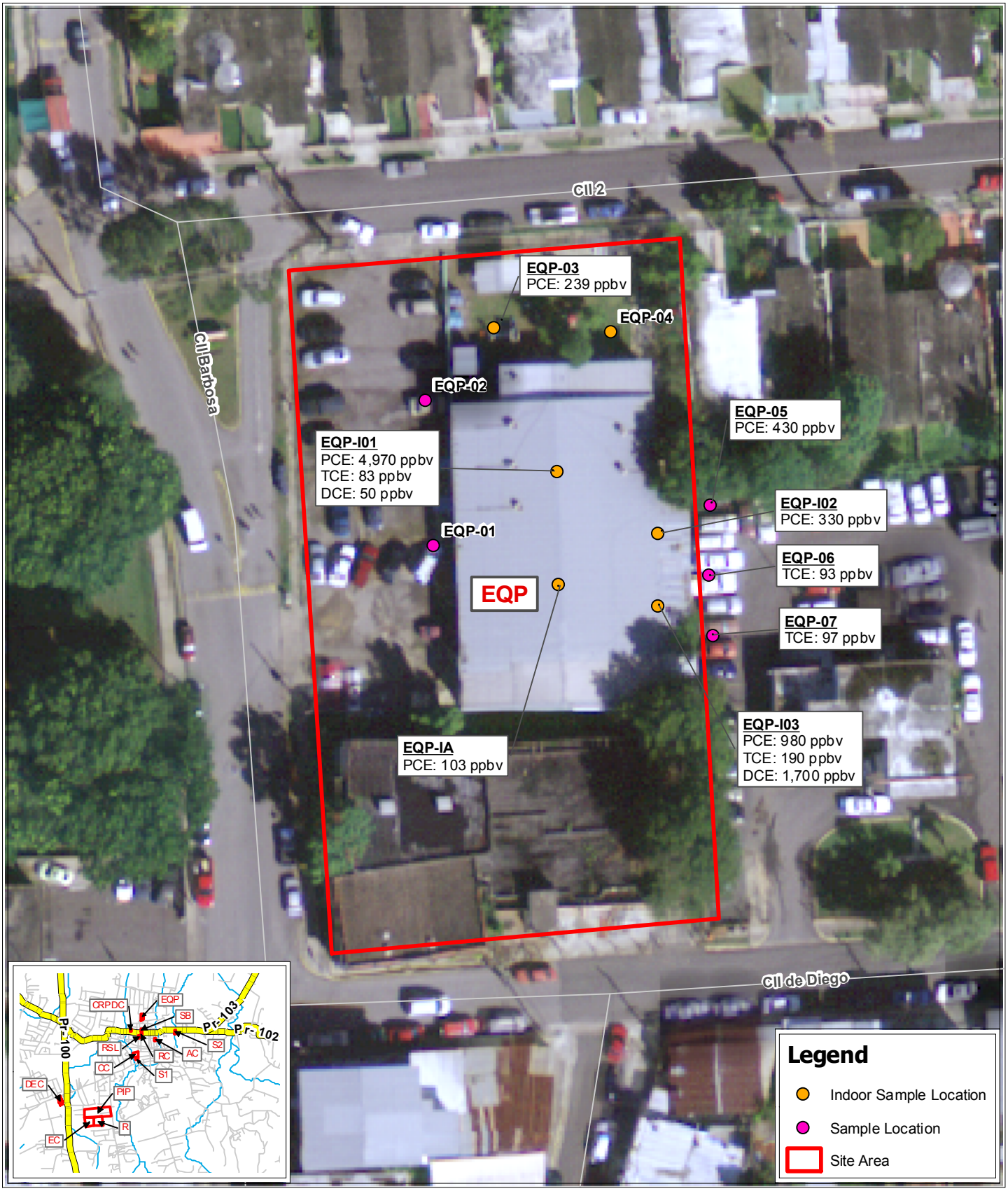
N
W E
S
Magnetic North

Legend

- Sample Location
- Site Area

150 0 150
Feet

U.S EPA Environmental Response Team Scientific Engineering Response and Analytical Services EP-W-09-031 W.A.# 0-130	Figure 5 Sample Location at PIP, EC & R Area Cabo Rojo Puerto Rico



Map created using 2006 high resolusion otthoimagery data from USGS, road data, site survey GPS data.
GPS data collected in Lat., Log., decimal degree. WGS 84

Map Creation Date: 13 July 2011

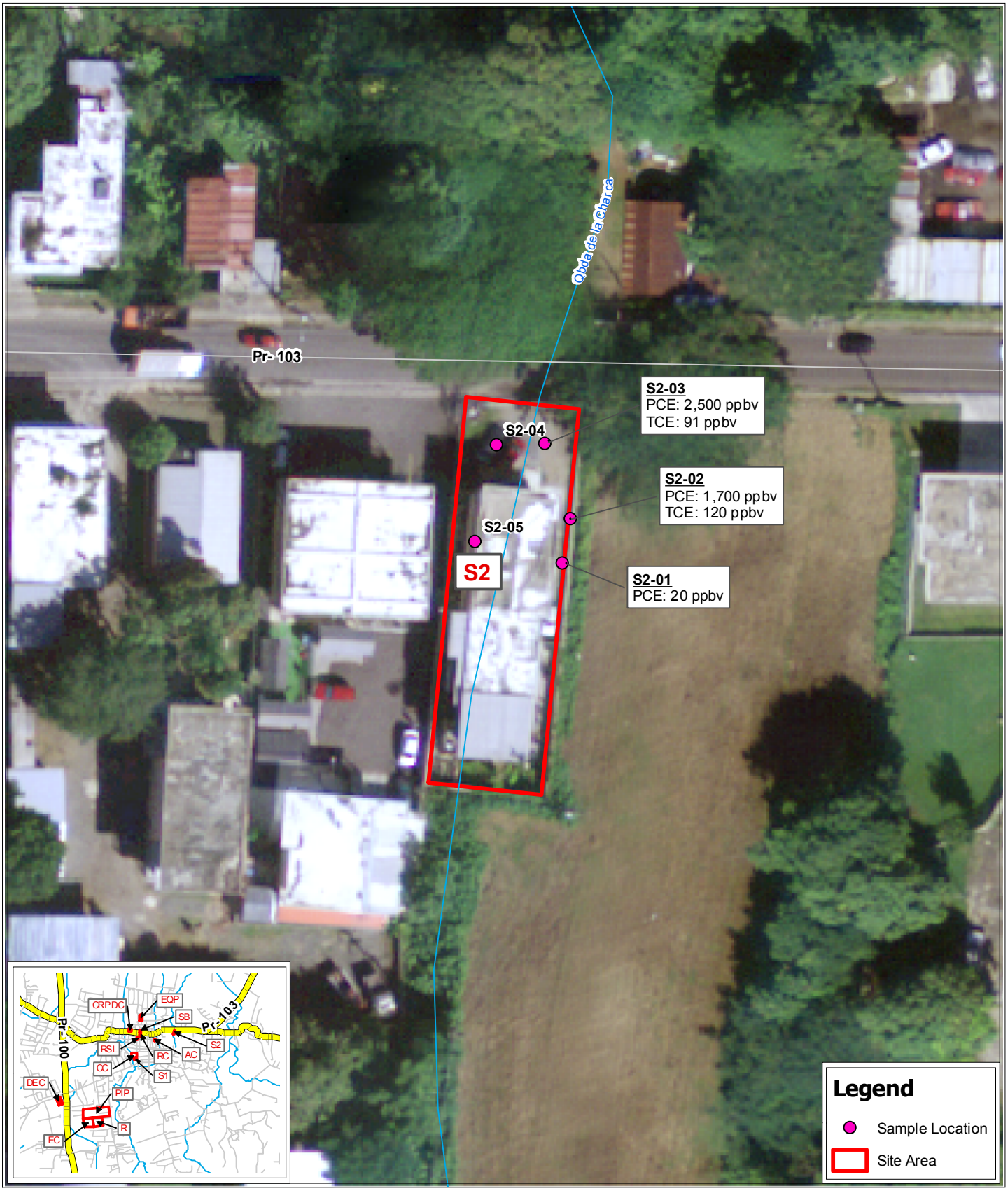
Coordinate system: Puerto Rico State Plane
FIPS: FIPS 5200
Datum: NAD83
Units: Feet

N W E S Magnetic North

50 0 50 Feet

Data: g:\arcviewprojects\SERAS01\00-130
MXD file: g:\ArcInfoProjects\SERAS01\SER00130_Cabo_Rojo_PR\130_TR_Sample_Location_at_EQP_Area_f6

U.S EPA Environmental Response Team Scientific Engineering Response and Analytical Services EP-W-09-031 W.A.# 0-130	Figure 6 Sample Location at EQP Area Cabo Rojo Puerto Rico



Map created using 2006 high resolusion otthoimagery data from USGS, road data, site survey GPS data.
GPS data collected in Lat., Log., decimal degree. WGS 84

Map Creation Date: 13 July 2011

Coordinate system: Puerto Rico State Plane
FIPS: FIPS 5200
Datum: NAD83
Units: Feet

N W E S Magnetic North

50 0 50 Feet

Data: g:\arcviewprojects\SERAS01\00-130
MXD file: g:\ArcInfoProjects\SERAS01\SER00130_Cabo_Rojo_PR\130_Sample_Location_at_S2_Area_f7

U.S EPA Environmental Response Team Scientific Engineering Response and Analytical Services EP-W-09-031 W.A.# 0-130	Figure 7 Sample Location at S2 Area Cabo Rojo Puerto Rico

APPENDIX A

Site Access Agreements

Cabo Rojo Site

February 2012

CONSENT FOR ACCESS TO PROPERTY

Address of Property in Which Interest Lies on #30 Carbonell Street, Cabo Rojo, Puerto Rico, I the undersigned, as owner or as a duly authorized representative of the owner consent to officers, employees, and authorized representatives of the United States Environmental Protection Agency ("EPA") entering and having continued access to the above-referenced property (hereinafter, "Property") to perform soil and ground water assessment activities. I understand that the assessment activities that will be performed at the property may include the following:

- Collection of soil gas vapor samples.
- Collection of soil and ground water samples using direct-push.
- Use of air monitoring instruments for health and safety purposes and/or wearing of protective clothing and equipment for compliance with Occupational Safety and Health Administration (OSHA) regulations.

I further consent to EPA releasing to the public all analytical results of any samples that EPA and its representative's collect or have collected on my property, as identified by my address.

I understand that EPA requires its contractors to maintain comprehensive vehicle liability insurance and comprehensive general liability insurance for bodily injury, death, and loss or damage to property or third person, arising from the activities of its contractors.

I realize that the actions taken on the Property by EPA, and its authorized representatives, are undertaken pursuant to its response and enforcement responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA"), 42 U.S.C.§§9601-et seq.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind. By my signature I also acknowledge that I am fully authorized to grant such access.

Signature _____ Date 6/3/2011

Banco Santander / Nelson Soto, Branch Manager
Name of Property Owner (Print)

CONSENT FOR ACCESS TO PROPERTY

Address of Properties in Which Interest Lies on State Roads 103/308, SR 308/307 Int. 100 and State Road #103 (aka: Ave Santos Ortiz, Cabo Rojo, Puerto Rico, I the undersigned, as owner or as a duly authorized representative of the owner consent to officers, employees, and authorized representatives of the United States Environmental Protection Agency ("EPA") entering and having continued access to the above-referenced property (hereinafter, "Property") to perform soil and ground water assessment activities. I understand that the assessment activities that will be performed at the property may include the following:

- Collection of soil gas vapor samples.
- Collection of soil and ground water samples using direct-push.
- Use of air monitoring instruments for health and safety purposes and/or wearing of protective clothing and equipment for compliance with Occupational Safety and Health Administration (OSHA) regulations.

I further consent to EPA releasing to the public all analytical results of any samples that EPA and its representative's collect or have collected on my property, as identified by my address.

I understand that EPA requires its contractors to maintain comprehensive vehicle liability insurance and comprehensive general liability insurance for bodily injury, death, and loss or damage to property or third person, arising from the activities of its contractors.

I realize that the actions taken on the Property by EPA, and its authorized representatives, are undertaken pursuant to its response and enforcement responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA"), 42 U.S.C.§§9601-et seq.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind. By my signature I also acknowledge that I am fully authorized to grant such access.

Norberto Benitez Torres — June 2, 2011

Signature — Date

Norberto M. Benitez Torres

Name of Property Owner (Print)

CONSENT FOR ACCESS TO PROPERTY

Address of Property in Which Interest Lies on Road 308 in the Centro Comercial La 100 in Cabo Rojo, Puerto Rico, I the undersigned, as owner or as a duly authorized representative of the owner consent to officers, employees, and authorized representatives of the United States Environmental Protection Agency ("EPA") entering and having continued access to the above-referenced property (hereinafter, "Property") to perform soil and ground water assessment activities. I understand that the assessment activities that will be performed at the property may include the following:

- Collection of soil gas vapor samples.
- Collection of soil and ground water samples using direct-push.
- Use of air monitoring instruments for health and safety purposes and/or wearing of protective clothing and equipment for compliance with Occupational Safety and Health Administration (OSHA) regulations.

I further consent to EPA releasing to the public all analytical results of any samples that EPA and its representatives collect or have collected on my property, as identified by my address, provided that copies of all such results and of any reports relating to the property are made available to the undersigned prior to such release.

I understand that EPA will require its contractors to maintain comprehensive vehicle liability insurance and comprehensive general liability insurance for bodily injury, death, and loss or damage to property or third person, arising from the activities of its contractors.

All activities to be perfomed by EPA at the property will be duly coordinated with the undersigned or its representative prior to entering the property and EPA or its representative shall conduct the activies stated above in a manner that minimizes risks and/or interruption of use of the property. EPA and/or its representative shall, upon termination of its acvities, leave the property in the same state that it was at the time of the first entry.

I realize that the actions taken on the Property by EPA, and its authorized representatives, are undertaken pursuant to its response and enforcement responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA"), 42 U.S.C.§§9601-et seq.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind, except as herein set forth herein above. By my signature I also acknowledge that I am fully authorized to grant such access.

Signature _____ Date May 20, 2011

Stella Investment, Inc.
Name of Property Owner (Print)

EMAIL Zeno.Denise@epamail.epa.gov

June 6, 2011

Ms. Denise V. Zeno
U.S. Environmental Protection Agency
290 Broadway, 18th Floor
New York, NY 10007-1866

Dear Ms. Zeno:

Previously I sent you our consent to access to the La Cien Shopping Court premises for the sampling activities to be conducted on June 13, 2011 by Environmental Protection Agency personnel or representatives. As mentioned therein, coordination of the activities is essential in order to minimize any risk of interruption of the operations at the premises, particularly the Walgreens store.

In order to fully inform our tenants of the activities, which is our contractual duty, the following is requested: 1) Time and date of the commencement of activities; 2) duration of the activities; and 3) copy of the sampling plan and boring locations. As we need to perform the notice to our tenants before the commencement of the sampling activities, we request your cooperation in providing us the information requested above within a short term after receipt of this letter. Your quick response will assist in preventing delays.

Sincerely,

Adrian Stella

STELLA INVESTMENT, INC.,
P.O. BOX 11918 CAPARRA HEIGHTS STATION SAN JUAN, P.R. 00922-1918
TELS. (787) 753-9552 • (787) 753-9553 • FAX: (787) 753-9554

APPENDIX B

Photodocumentation

Cabo Rojo Site

February 2012

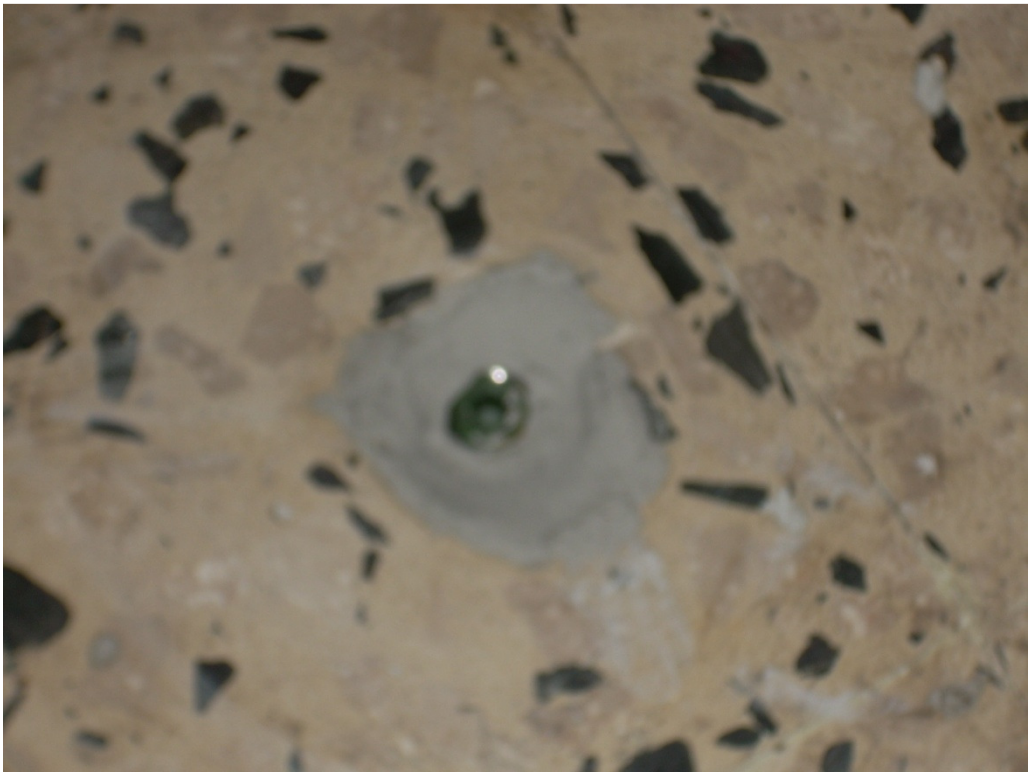


Photo 1. 6/13/11 - Well Installation at CRPDC-I01

Photo 2. 6/13/11 - Inside CRPDC Facing North (CRPDC-I02)

Photo 3. 6/13/11 - Well Installation CRPDC-I02

Photo 4. 6/13/11 - CRPDC-I01 (View: East)

Photo 5. 6/13/11 - Cementing Well at CRPDC-I04

Photo 6. 6/13/11 - Possible Drain Outlet into Courtyard – CRPDC-I04

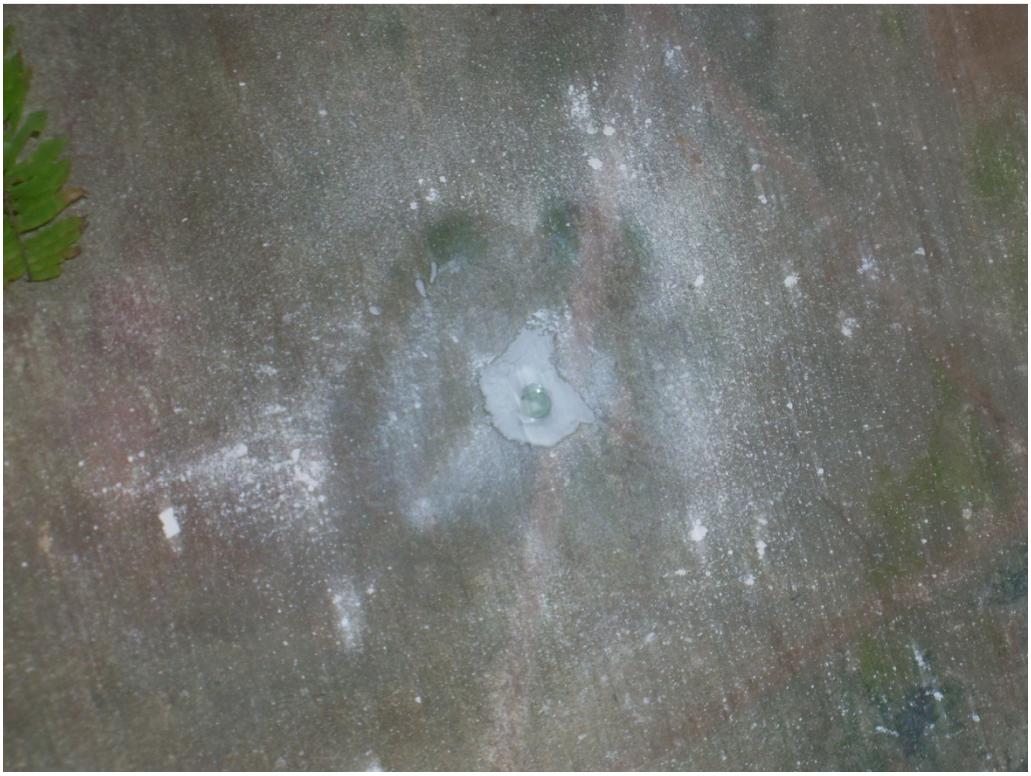


Photo 7. 6/13/11 - CRPDC-I04

Photo 8. 6/13/11 - Alley East of CRPDC (CRPDC-I04)

Photo 9. 6/13/11 - EQP-I01 Head Start

Photo 10. 6/13/11 - Inside Well DEC-I01

Photo 11. 6/13/11 - DEC-I02 Inside Empty Store Next to Walgreens and Chinese Restaurant

Photo 12. 6/13/11 - EQP-I02

Photo 13. 6/13/11 - EQP Ground Moisture

Photo 14. 6/13/11 - EQP-I03

Photo 15. 6/13/11 - EQP-I03

Photo 16. 6/14/11 - CC-I01 Inside Chester's Chicken

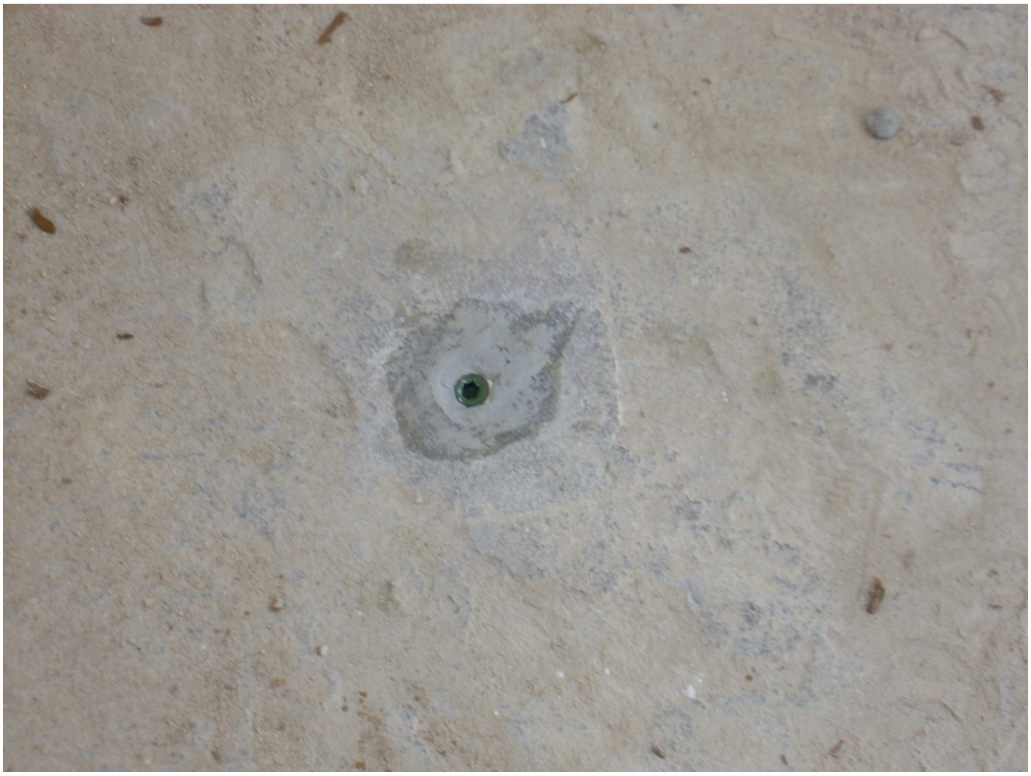


Photo 17. 6/14/11 - CC-02 Behind Chester's Chicken

Photo 18. 6/14/11 - CC-02 Behind Chester's Chicken

Photo 19. 6/14/11 - CC-I02 Inside Clothing Store Next to Chester's Chicken (South)

Photo 20. 6/14/11 - CC-I03 Inside Empty Store South of Chester's Chicken

Photo 21. 6/14/11 - AC-I01 (Junta)

Photo 22. 6/14/11 - AC-I02 (Café)

Photo 23. 6/14/11 - RC-I01

Photo 24. 6/15/11 - PIP-09 (View: North)

Photo 25. 6/15/11 - PIP-10 (View: Northwest)

Photo 26. 6/15/11 - PIP-08 (View: Northwest)

Photo 27. 6/15/11 - PIP-07 (View: South)

Photo 28. 6/15/11 - PIP-07 (View: Northwest)

Photo 29. 6/15/11 - PIP-06 (View: West)

Photo 30. 6/15/11 - PIP-11 (View: North)

Photo 31. 6/15/11 - PIP-12 (View: Northeast)

Photo 32. 6/15/11 - PIP-13 (View: Northwest)

Photo 33. 6/15/11 - PIP-14 (View: Northeast)

Photo 34. 6/15/11 - PIP-15, PIP-16 (View: North)

Photo 35. 6/15/11 - PIP-14 (View: East)

Photo 36. 6/15/11 - PIP-15 (View: North)

Photo 37. 6/15/11 - PIP-16 (View: Northeast)

Photo 38. 6/15/11 - PIP-17 (View: East)

Photo 39. 6/15/11 - PIP-22 (View: Southeast)

Photo 40. 6/15/11 - PIP-21, PIP-20 (View: South)

Photo 41. 6/15/11 - Porch Near PIP-19 (View: Southwest)

Photo 42. 6/15/11 - Drum on Porch Near PIP-19 (View: West)

Photo 43. 6/15/11 - PIP-20 (View: East)

Photo 44. 6/15/11 - PIP-18 (View: South)

Photo 45. 6/15/11 - PIP-18 (View: North)

Photo 46. 6/15/11 - PIP-23 (View: Southeast)

Photo 47. 6/15/11 - PIP-25 (View: West)

Photo 48. 6/15/11 - PIP-27 (View: South)

Photo 49. 6/15/11 - PIP-28 (View: West)

Photo 50. 6/15/11 - PIP-01 (View: East)

Photo 51. 6/15/11 - PIP-02 (View: Northeast)

Photo 52. 6/15/11 - PIP-03, PIP-04 (View: North)

Photo 53. 6/15/11 - Sampling PIP-04 (View: East)

Photo 54. 6/15/11 - PIP-05 (View: South)

APPENDIX C

Tedlar Bag Sampling Worksheets

Cabo Rojo Site

February 2012

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: JON MCBURNEY

U.S. EPA/ERT WAM: Catanzarita

Date: 6/14/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location ~~PPM~~ PID READING	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
DEC-08	D'ELEGANT	— MAX 20PPM	7'	8:55	VOYAGER	1
DEC-07	D'ELEGANT	1.1	3.5'	9:10	VOYAGER	1
DEC-06	D'ELEGANT	4.8	3.5'	9:30	VOYAGER	1
DEC-05	D'ELEGANT	20.8	3.5'	9:40	VOYAGER	1

Comments: MULTIRAE 016933 CAL 6/8/11

Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL/ANALYSIS	[illegible]	6/14/11	[illegible]	6/14/11	10:05

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0- 130

Sampler: JON MCBURNEY

U.S. EPA/ERT WAM: Catanzarita

Date: 6/14/11

SERAS Task Leader: McBurney

Sample #	Location	~~Sub Location~~ PID	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
DEC-04	D'ELEGANT	0.2	3.5'	9:55	VOYAGER	1
DEC-03	D'ELEGANT	1.0	3.5'	10:00	VOYAGER	1
DEC-01	D'ELEGANT	0.9	3.5'	10:15	VOYAGER	1
DEC-02	D'ELEGANT	0.0	3.5'	10:45	VOYAGER	1

Comments: MULTIRAE CALIBRATED 6/8/11

Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL/ANALYSIS	[signature]	6/14/11	[signature]	6/14/11	11:25

SAMPLER J. McBURNEY TEDLAR BAG SAMPLING SHEET - CABO-ROJO
6/14/11

WA-0-130

	P.D		
CRPDG-02	5.3	3.5'	13:35
CRPDG-03	0.0	3.5'	13:45
CRPDG-01	—	3.5'	NO SAMPLE
CRPDG-04	0.7	3.5'	13:55
CRPDC-01	—	7'	
EQP-02	2.2	3.5'	1500
EQP-01	0.4	3.5'	1505
EQP-03	58.7	3.5'	15:40
EQP-04	3.4	3.5'	15:30

COMMENTS: MultiRAE 010933 Cal 6/8/11

ITEMS	RELINQUISHED BY	DATE	RECEIVED BY	DATE	TIME
All/Analysis	[signature]	6/14/11	[signature]	6/14/11	16:05

Sampler - J. McBurney
6/14/11

Tedlar Bag Sampling Sheet

Cabo-Rojo
WA-0-130

EQP-05	6.3	16:30	3.5'
EQP-06	11.8	16:43	3.5'
EQP-07	36.0	17:00	3.0'

Comments: MultiRae 010933 Cal 6/8/11

Items Relinquished By	Date	Received By	Date	Time
All/Analyses. J. McBurney	6/14/11	D. Daly	6/14/11	17:35

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: DuBois/Magan

U.S. EPA/ERT WAM: Catanzarita

Date: 6/14/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
	CRPD-I02	subfloor ~6" down void to	3'		PID 4.5 O2 19.0	1-L
	CRPD-I01	sub ~6" void to	2'6"	1615 1619	65 ppm VOC 17.9 % O2	1-L 6-L Summa
	CRPD-I03	courtyard sub ~6" beneath	3' = dirt	1637	8.5 ppm 17.9 % O2	1-L
	CRPD-I04	Alley sub ~6" beneath	3' = dirt	1600 1605	PID 22.4 O2 17%	1-L 1-L Dup
	EQP-I01	Head start sub ~6" floor ~ 18" ~6" slab	2 feet			
	DEC-I01	Walgreens void	~3ft	1525	PID 0 O2 ~15%	1-L
	DEC-I02	Empty Bldg ~6" slab, void, dirt	~3ft	1507	Did not take reading	1-L
	EQP-I02	slab poured on ground no void				
	EQP-I03	"				

Comments: DEC-I02 Empty bldg Walgreens 4' 274' Parking

Items/Reason	Relinquished by	Date	Received by	Date	Time

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: DuBois / Magan

U.S. EPA/ERT WAM: Catanzarita

Date: 6/15/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
	EQP - I01	Head Start	2 ft	0817	VOC (not collected) PID = 0 ppm	1-L
	EQP - I01 DUP	" "	"	0821	PID = 0 ppm	1-L
	EQP - I02	Print shop	1 ft	~~0905~~ 0920	PID - 4.6 ppm	1-L
	EQP - I03	Print shop sink	1 ft	0932	O_2 = 18.2 PID - 11.1	1-L
	EQP - I04	Indoor	1 ft	0942	PID = 0.0	1-L

Comments:

Items/Reason	Relinquished by	Date	Received by	Date	Time
8/Analysis	[signature]	6/15/11	[signature]	6/15/11	11:15

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: McBurney/Grossman

U.S. EPA/ERT WAM: Catanzarita

Date: 6/15/11

SERAS Task Leader: McBurney

Sample #	Location	PID ~~Sub Location~~	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
S1-03	SERRANO 1	4.2	3.5'	10:30	VOYAGER	1
S1-02	"	1.7	3.5'	10:35	VOYAGER	1
S1-~~03~~ 01	"	0.3	3.5'	10:40	VOYAGER	1

Comments: MULTIRAE 5 CAL 6/8/11

Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL / ANALYSIS	[signature]	6/15/11	[signature]	6/15/11	11:14

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: M Burney/Grossman

U.S. EPA/ERT WAM: Catanzarita

Date: 6/15/11

SERAS Task Leader: McBurney

Sample #	Location	~~Sub Location~~ PID	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
CC-01	Chester's Chicken	1.2	3.5'	11:00	Voyager	1
CC-02	" "	2.7	3.5'	11:10	Voyager	1

Comments: Multirae 5 Cal 6/8/11

Items/Reason	Relinquished by	Date	Received by	Date	Time
All/Analysis	[signature]	6/15/11	[signature]	6/15/11	15:59

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: McBURNEY/GROSSMAN

U.S. EPA/ERT WAM: Catanzarita

Date: 6/15/11

SERAS Task Leader: McBurney

Sample #	Location	~~Sub-Location~~ PID	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
~~S2-01~~						
S2-01	SERRANNO 2	0.5	3.5'	1521	VOYAGER	1
S2-02	"	2.4	3.5'	1525	VOYAGER	1
S2-03	SERRANNO D2	0.3 * 2.5	~~3.5'~~	1530	VOYAGER	1
S2-04	"	0.0	3.5'	1545	VOYAGER	1
S2-05	"	0.7	3.5'	1601	VOYAGER	1

Comments: MULTIRAE 5 CAL 6/8/11
* NO SAMPLE @ 3.5'

Relinquished by	Date	Received by	Date	Time
[illegible]	6/15/11	[illegible]	6/15/11	15:59

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-

Sampler: DeBois / Magan

U.S. EPA/ERT WAM: Catanzarita

Date: 6/15/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
1	RC-IØ1	3' soil		14:00	PID = Ø	1-L
1	CC-IØ1	6" slab + soil	3'	16:42	PID = 0.2	1-L
	~~CC-IØ2~~	no sample			~~PID - Pump failed~~	
1	CC-IØ3	6" slab/6" road/ground		16:58	PID = 0.7	1-L

Comments:

Items/Reason	Relinquished by	Date	Received by	Date	Time
1/Analysis		6/15/11		6/15/11	14:01

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: DuBois/Magan

U.S. EPA/ERT WAM: Catanzarita

Date: 6/15/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
	S2-I01					
	~~SDCII-I01~~	PID = 0.7		17:45	PCE/TCE/DCE	1-L
	SDCII-I02	NO SAMPLE				

Comments:

Items/Reason	Relinquished by	Date	Received by	Date	Time
1/Analysis	[illegible]	6/15/11	[illegible]	6/15/11	18:20

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: McBurney / Grossman

U.S. EPA/ERT WAM: Catanzarita

Date: 6/16/11

SERAS Task Leader: McBurney

Sample #	Location	~~Sub Location~~ PID	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
PIP-~~15~~ 14	PRIDCO I.P	0.6	3.5'	8:20	VOYAGER	1
PIP-15	"	3.6	3.5'	8:24	VOYAGE	1
PIP-14	"	0.6	3.5'	8:30	TO-15	6 5 um MA
PIP-16	"	3.2	3.5'	8:40	VOYAGER	1
PIP-17	"	1.5	3.5'	8:45	VOYAGER	1
PIP-23	"	0.0	3.5'	9:00	VOYAGER	1

Comments: MULTIRAE 5 - CAL 6/8/11

Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL/ANALYSIS	[signature]	6/16/11	[signature]	6/16/11	10:20

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: McBURNEY/GROSSMAN

U.S. EPA/ERT WAM: Catanzarita

Date: 6/16/11

SERAS Task Leader: McBurney

Sample #	Location	~~Sub Location~~ PID	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
PIP-22	PRIDCO IND. PARK	2.5	3.5'	9:25	VOYAGER	1
PIP-11	"	X	3.5'	10:00	VOYAGER	1
PIP-12	"	X	3.5'	10:30	VOYAGER	1
PIP-13	"	X 0.3	3.5'	11:10	VOYAGER	1
PIP-09	"	0.0	3.5'	11:25	VOYAGER	1
PIP-10	"	0.0	3.5'	11:30	VOYAGER	1
PIP-08	"	0.0	3.5'	11:45	VOYAGER	1

Comments: X PURGED WITH VAC BOX. NOT SCREENED WITH PID DUE TO RAIN/MOISTURE.

Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL ANALYSIS	[signature]	6/16/11	[signature]	6/16/11	12:30

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: DuBois / Mulgan

U.S. EPA/ERT WAM: Catanzarita

Date: 6/16/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
AC-T02	Acevedo cleaners - cafe	~~PID = 11.3+7~~	2'	11:20	Voyager	1-L
AC-T01	Junta (very slow)	—	3'	11:30	Voyager	1-L

Comments: PID not working

Items/Reason	Relinquished by	Date	Received by	Date	Time
2/Analysis	[signature]	6/16/11	[signature]	6/16/11	12:30

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: McBurney / Grossman

U.S. EPA/ERT WAM: Catanzarita

Date: 6/16/11

SERAS Task Leader: McBurney

Sample #	Location	~~Sub Location~~ PID	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
PIP-07	PRIDCO IND. PARK	0.0	3.5'	13:20	VOYAGER	1
PIP-06	"	0.0	3.5'	13:30	VOYAGER	1
PIP-01	"	0.0	3.5'	13:50	VOYAGER	1
PIP-01D	"	0.0	3.5	13:55	VOYAGER	1
PIP-03	"	0.0	3.5'	14:05	VOYAGER	1
PIP-02	"	0.0	~~3.5~~ 2.5'	14:32	VOYAGER	1
PIP-04	"	0.0	3.5'	14:48	VOYAGER	1
PIP-05	"	0.0	3.5'	1455	VOYAGER	1
						9

Comments:

Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL ANALYSIS	[signature]	6/16/11	[signature]	6/16/11	15:20

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0- 130

Sampler: Dubois/Magnan

U.S. EPA/ERT WAM: Catanzarita

Date: 6/16/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
RSL-001	Brown gate / drive	PID = 0.0	3'	13:30	Voyager	1-L
Slum bar PIP-21	Pridco Ind Park	PID = 3.5	2' (refusal)	15:18	Voyager	1-L
CB PIP-20	Slugbar	PID = 1.8	3.5'	15:30	Voyager	1-L
PIP-29	Geoprobe	PID = 0.9	3.5'	15:40	Voyager	1-L
PIP-19	Slum bar	PID = 0.0	2.5' refusal	15:58	Voyager	1-L
PIP-18	Slugbar	PID = 0.0	3.5'	16:09	Voyager	1-L

Comments:

Items/Reason	Relinquished by	Date	Received by	Date	Time
Chem. Analysis	[signature]	6/16/11	[signature]	6/16/11	14:52

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: McBurney/Grossman

U.S. EPA/ERT WAM: Catanzarita

Date: 6/~~14~~ 17/11

SERAS Task Leader: McBurney

Sample #	Location	~~Sub Location~~ PID	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
PIP-27	Rexoco Ind. Park	17 **	2' *	8:10	VOYAGER	1
PIP-26	" "	1.4	3.5'	8:18	VOYAGER	1
EC-04	Eaton Cutler	N/A	3.5'	8:58	Voyager	1

Comments:
* REFUSAL @ 2' DUE TO SHALLOW BEDROCK.
** MW 200T, FALL TO 17

Items/Reason	Relinquished by	Date	Received by	Date	Time
3/Analysis	[signature]	6/17/11	[signature]	6/17/11	10:32

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: Grossman

U.S. EPA/ERT WAM: Catanzarita

Date: 6/17/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)	PID
~~(5)~~	~~Pridco~~	~~PIP-25~~	~~3.5'~~	~~8:45~~	~~Voyager~~	~~1L~~	~~0~~
~~(6)~~	~~Pridco~~	~~PIP-28~~	~~3.5'~~	~~9:05~~	~~Voyager~~	~~1L~~	~~0~~
PIP-25	PRIDCO	0.0	3.5'	8:45	Voyager	1L	
PIP-28	PRIDCO	0.0	3.5'	9:05	Voyager	1L	

Comments:

Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL/ANALYSIS	[signature]	6/17/11	[signature]	6/17/11	13:40

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: Dubios

U.S. EPA/ERT WAM: Catanzarita

Date: 6/17/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
EC-03	~~Eatton~~ Cragger	PID = 10.0	2.5'	10:12	Voyager	1
EC-02	↓	PID = 0.0	4'	10:25	Voyager	1
EC-01 #	↓	PID = Ø	hole 3' wet	10:35 1'	Voyager	1
~~RSO-01~~	Reto R-01		3.5'			AD
~~RSO-02~~			4'			AD
~~RSO-03~~			3.5'			AD
~~RSO-04~~	R-04	PID = 0.1	4'	12:03	Voyager	1
~~RSO-05~~	R-05	PID = 0.3	4'	11:55	Voyager	1
~~RSO-06~~	R-06	PID = 0.6	3.5'	11:48	Voyager	1
~~RSO-07~~	R-07	PID = 0.7	3'	11:58	Voyager	1
		AD				

Comments: # hole to 3.5' – wet, sampled @ 1'

Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL/ANALYSIS	[signature]	6/17/11	[signature]	6/17/11	13:42

EPA/Environmental Response Team
Scientific, Engineering, Response and Analytical Services
Lockheed Martin Corp., Edison, NJ
U.S. EPA Contract No. EP-W-09-031

Tedlar Bag Sampling Worksheet

Site: Cabo Rojo

WA# 0-130

Sampler: Grossman

U.S. EPA/ERT WAM: Catanzarita

Date: 6/17/11

SERAS Task Leader: McBurney

Sample #	Location	Sub Location	Well Depth	Time	Tedlar Bag Analysis/Method	Volume (Liters)
SB-01	Santander Bank	0.0	3.5	10:55	Voyager	1 L
SB-02	Santander Bank	0.6	3.5	11:02	Voyager	1 L
SB-03	Santander Bank	0.3	3.5'	11:11	Voyager	1L
SB-04	Santander Bank	0.0	3.5'	11:16	Voyager	1L
R-01	Reto	0.3	3.5'	11:52	Voyager	1L
R-02	Reto	0.3	4'	12:00	Voyager	1L
R-03	Reto	0.3	3.5'	12:08	Voyager	1L

Comments:

Items/Reason	Relinquished by	Date	Received by	Date	Time
ALL ANALYSIS	[illegible]	6/17/11	[illegible]	6/17/11	13:47

APPENDIX D

Photovac Voyager Operating Procedure for the Cabo Rojo Site

Cabo Rojo Site

February 2012

Photovac Voyager Operating Procedure for the Cabo Rojo Site

METHOD SUMMARY

Air/soil gas samples can be analyzed by the Photovac Voyager. Brief method summaries are provided below. All methods use a Photovac Voyager GC equipped with a 10.6 eV ultraviolet light source and a Photoionization Detector (PID), and use external standards to tentatively identify and quantitate compounds of interest. Gaseous contaminants are ionized as they emerge from the column. The ions are then attracted to an oppositely charged electrode which causes a current and sends an electronic signal to the Photovac internal microprocessor.

Air/Soil Gas Samples

Ambient air or soil gas samples are withdrawn using the Photovac Voyager probe with and internal pump and directly injected onto the loop of the GC .

INTERFERENCES AND POTENTIAL PROBLEMS

This instrument is <u>not</u> to be exposed to precipitation. This instrument is best utilized in a stable temperature environment 5°C to 40°C to avoid the fluctuating retention times which may occur with changing temperatures. Readings can only be reported relative to retention times of the calibration standard used. It is advisable to avoid combustion fumes while using the instrument as they can contaminate the column. High sample alkane concentration, C_1-C_6, as in many landfill samples, may interfere with the resolution and detector response of early eluting aromatics and chlorinated alkenes.

Air/Soil Gas Calibration

Since multiple calibrations may be needed for a field analysis, the original standard is diluted into Summa canisters to provide maximum stability in the field. Tiplically a series of 10ppbv, 50 ppbv, 100 ppbv and 500 ppbv standards are made up in Summa Canisters. Once transported to the field, each canister can be used to fill 10 to 15 one L Tedlar bags from which aliquots can be analyzed. The analyst constructs a calibration curve by injecting the same volumes. By setting the Photovac Voyager to pump 10 sec and inject for 5 sec a 250 μL injection volume will be introduced onto the GC column, a four point cal curve can be established.

QUALITY ASSURANCE/QUALITY CONTROL

The following QA/QC requirements must be followed and provided in the data package submitted:

1. Chain of custody documentation.

2. Sample log, including date and time of sample collection, date and time of analysis, and run numbers.

3. Instrument calibration data.

4. Method Blanks are to be analyzed after samples containing high concentrations of analytes. If a sample has low or non-detect concentrations of analytes no blanks will be analyzed.

5. Labeling of chromatograms - Each chromatogram must be clearly identified by analysis type (i.e., sample number, or calibrant concentration), injection time (sec), run number, date, and time.

6. Duplicates analysis - A duplicate sample analysis is to be performed on field duplicates to check method/analyst precision. The RPD of the area response of any of the compounds should be within 30%.

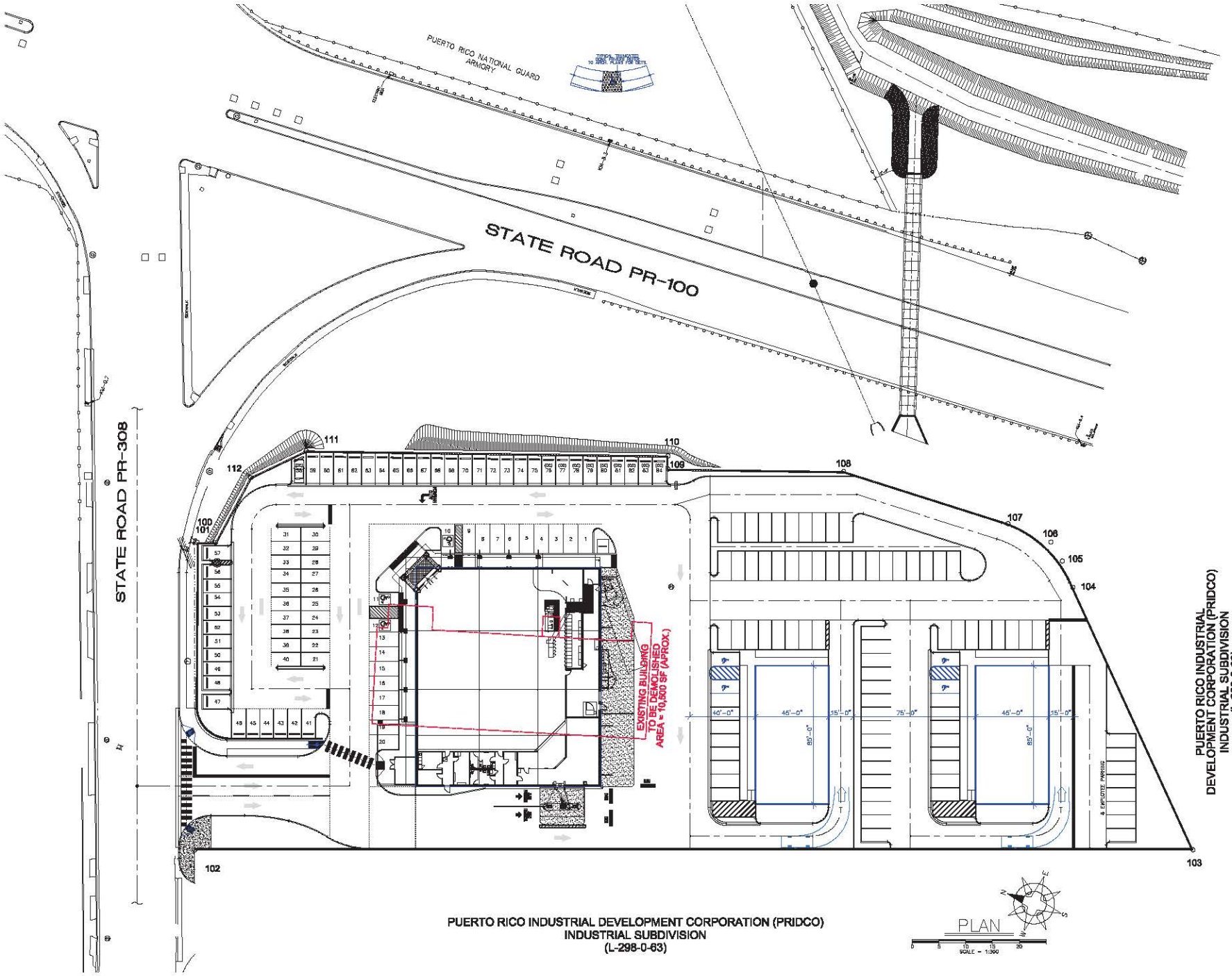
7. Retention time/instrument response check - Since compound identification is based upon RT matches, a mid-range calibration standard should be analyzed every 6 hours of operation.

APPENDIX E

Walgreen's Development Map (DEC)

Cabo Rojo Site

February 2012


PUERTO RICO NATIONAL GUARD ARMORY
STATE ROAD PR-100
STATE ROAD PR-308
EXISTING BUILDING TO BE DEMOLISHED AREA = 10,500 SF (APPROX.)
PUERTO RICO INDUSTRIAL DEVELOPMENT CORPORATION (PRIDCO)
INDUSTRIAL SUBDIVISION
(L-298-0-63)
PLAN
SCALE - 1:300
ANTONIO F. HERNANDEZ-CRUZ, PE
HF ENGINEERING CONSULTING GROUP, P&C

APPENDIX F

Preliminary Results of VOCs in Air Analysis Using SERAS SOP# 1814

Cabo Rojo Site

February 2012

Date:	July 5, 2011
To:	Work Assignment Manager: Jeff Catanzarita/George Prince, EPA/ERTC
From:	V. Kansal, Analytical Group Leader, SERAS Vinod Kansal
Subject:	Preliminary Results of VOCs in Air Analysis using SERAS SOP# 1814
Project:	Cabo Rojo, WA# 0-130

This document contains the analytical results and report for the following samples:

Chain(s) of Custody #:	2-062111-093714-0005
Analyses:	TO-15
No. of Samples:	3
Matrix:	Air

This report contains the results of 3 samples received on 07/05/11 for analysis of VOCs in Air by EPA TO-15.

ec R. Singhvi, V.Kansal, D. Miller, D. Killeen, Jon McBurney, G. Depasquale

cc Analyst: Ben Beauchaine
Central File

Table 1.1 Result of the Analysis for VOC (ppbv) in Air
WA# 0-130 Cabo Rojo

Method: SERAS SOP#1814

Sample Number	Method Blank		0-130-0040		0-130-0088		Method Blank		0-130-0094	
Sample Location	6/22/2011		PIP-14		CRPDC-I01		6/24/2011		Trip Blank	
Sublocation										
Analyte	Results ppbv	*RL* ppbv	Results ppbv	*RL* ppbv	Results ppbv	*RL* ppbv	Results ppbv	*RL* ppbv	Results ppbv	*RL* ppbv
Vinyl Chloride	U	0.0300	U	0.0300	U	0.150	U	0.0300	U	0.0300
1,1-Dichloroethene	U	0.0300	U	0.0300	U	0.150	U	0.0300	U	0.0300
trans-1,2-Dichloroethene	U	0.0300	U	0.0300	U	0.150	U	0.0300	U	0.0300
1,1-Dichloroethane	U	0.0300	U	0.0300	U	0.150	U	0.0300	U	0.0300
cis-1,2-Dichloroethene	U	0.0300	U	0.0300	U	0.150	U	0.0300	U	0.0300
1,2-Dichloroethane	U	0.0300	U	0.0300	U	0.150	U	0.0300	U	0.0300
Trichloroethene	U	0.0300	U	0.0300	57.2	0.150	U	0.0300	U	0.0300
Tetrachloroethene	U	0.0300	0.151	0.150	100000	750	U	0.0300	U	0.0300

Table 1.1 Result of the Analysis for VOC(µg/m3) in Air
WA# 0-130 Cabo Rojo

Method: SERAS SOP#1814

Sample Number	Method Blank		0-130-0040		0-130-0088		Method Blank		0-130-0094	
Sample Location	6/22/2011		PIP-14		CRPDC-I01		6/24/2011		Trip Blank	
Sublocation										
Analyte	Results µg/m3	*RL* µg/m3	Results µg/m3	*RL* µg/m3	Results µg/m3	*RL* µg/m3	Results µg/m3	*RL* µg/m3	Results µg/m3	*RL* µg/m3
Vinyl Chloride	U	0.0767	U	0.0767	U	0.383	U	0.0767	U	0.0767
1,1-Dichloroethene	U	0.119	U	0.119	U	0.595	U	0.119	U	0.119
trans-1,2-Dichloroethene	U	0.119	U	0.119	U	0.595	U	0.119	U	0.119
1,1-Dichloroethane	U	0.121	U	0.121	U	0.607	U	0.121	U	0.121
cis-1,2-Dichloroethene	U	0.119	U	0.119	U	0.595	U	0.119	U	0.119
1,2-Dichloroethane	U	0.121	U	0.121	U	0.607	U	0.121	U	0.121
Trichloroethene	U	0.161	U	0.161	308	0.806	U	0.161	U	0.161
Tetrachloroethene	U	0.203	1.03	1.02	681000	5090	U	0.203	U	0.203

USEPA

DateShipped:
CarrierName:
AirbillNo:

WO# R106003

CHAIN OF CUSTODY RECORD

Cabo Rojo
Jon McBurney
609-937-9116

No: 2-062111-093714-0005

Cooler #:
Lab: SERAS

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Start Pressure	Stop Pressure	Sample_Remarks	MS/MSD
-01	0-130-0040	PIP-14	TO-15	Soil Gas	6/16/2011	1	Summa Canister	None	-30	0	PID 0.6 SUMMA ID = 23	N
-02	0-130-0088	CRPDC-I01	TO-15	Soil Gas	6/14/2011	1	Summa Canister	None	-30	0	PID 65 SUMMA ID: 135	N
-03	0-130-0094	Trip Blank	TO-15	Air	6/17/2011	1	Summa Canister	None	-30		Summa ID = 32	N

Special Instructions:

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All/Analysis	[signature]	6/21/11	[signature]	6/21/11	15:20	All/Analysis	[signature]	6/22/11	[signature]	6/22/11	1149