Five-Year Review Report

Third Five-Year Review Report
for
Harris Corp. (Palm Bay Plant)
FLD000602334

Palm Bay
Brevard County, Florida

February 2014

United States Environmental Protection Agency
Region 4
Atlanta, Georgia

Approved by:

Franklin E. Hill
Director, Superfund Division

Date: 2/3/14

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for
Harris Corp. (Palm Bay Plant)
2400 Palm Bay Boulevard
Palm Bay
Brevard County, Florida

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
bls	Below Land Surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Act Information System
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Contaminant of Concern
1,2-DCE	1,2-dichloroethene
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FYR	Five-Year Review
gpm	gallons per minute
IC	Institutional Control
LTRA	Long-Term Response Action
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OU	Operable Unit
O&M	Operation and Maintenance
PBU	Palm Bay Utilities
PCE	Tetrachloroethene
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SAS	Surficial Aquifer System
SDWA	Safe Drinking Water Act
TBC	To-be-considered
TCE	Trichloroethene
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound

Executive Summary

Introduction

The Harris Corp. (Palm Bay Plant) Superfund Site (the Site) occupies approximately 310 acres in Palm Bay, Florida. The Harris Corporation has been manufacturing electronic parts, communication or information processing equipment on the Site since 1967. Two previous manufacturing firms operated on a portion of the property and used the Site for painting operations, a chromium plating operation, a machine shop and drum storage area. The Site remains in continued use; the Harris and Intersil Corporations continue to manufacture equipment on site.

In 1980, volatile organic compound (VOC) contamination was detected during sampling of public water supply wells south of the Harris Corporation facility. Plumes of contaminated ground water were subsequently identified beneath the Harris Corporation facility and the adjacent well field owned by Palm Bay Utilities (PBU). EPA selected remedies including ground water extraction, ground water treatment by aeration, and monitored natural attenuation (MNA) of ground water. The triggering action for this Five-Year Review (FYR) was the signing of the previous FYR on February 3, 2009.

Remedy Components

The Records of Decision (RODs) for operable unit (OU) 1 and OU2 were signed in June 1990 and February 1995, respectively. OU1 addresses the ground water contamination associated with the government systems facility of Harris Corporation. The selected remedy for OU1 in the 1990 ROD required modification to the Site's existing ground water extraction and treatment system and consists of the following remedial components:

- Continued operation of the existing extraction, treatment and disposal system.
- A design analysis for plume containment and treatment.
- Modification of the ground water extraction and treatment system based on results of the design analysis.
- Continued sampling and monitoring of the cleanup.
- A review of the ground water extraction and treatment system by EPA and Florida Department of Environmental Regulation (FDER) within five years after the onset of the remedial action.

Based on the decreased contaminant concentrations in monitoring well samples at OU1, EPA approved the deactivation of the OU1 ground water treatment system as of October 2002. The OU1 system was then placed on standby mode with continued monitoring of the Site's ground water. Ground water remediation at OU1 is currently being addressed by MNA.

OU2 addresses the ground water contamination associated with the Intersil Corporation property. The major components of the selected remedy for OU2 in the 1995 ROD include:

- Continued operation of the existing extraction, treatment and disposal system.
- Extraction of contaminated ground water from the surficial aquifer.

- Treatment of the extracted ground water by air stripping.
- Injection of the treated ground water into the Floridan Aquifer.
- Elimination of Recovery Well SC-TS4.
- Ground water monitoring.

Based on decreased contaminant concentrations in monitoring well samples and the relatively small amount of mass being removed from the ground water at OU2, EPA approved the deactivation of the OU2 ground water treatment system on June 5, 2000. Ground water remediation at OU2 is currently being addressed by MNA.

Technical Assessment

The remedies for OU1 and OU2 are functioning as intended by the decision documents. The ground water plume is effectively contained and contaminant concentrations are declining. Consumption of contaminated ground water is prohibited under the Florida Ground Water Delineated Area designation. Public drinking water in the area is provided by a public utility and is pumped from upgradient areas not affected by the Site.

Natural attenuation appears to be working, but contaminant concentrations spike occasionally and the attenuation rate is slower than previously modeled. The potentially responsible parties (PRPs) believe that the observed contaminant spikes are the result of fluctuations in the microbial populations. However, the contaminant spikes could be due to residual source material in the vadose zone. The operation and maintenance (O&M) plan is not up to date and does not include the MNA remedy. The PRPs will continue to monitor microbial populations and if needed, will work with EPA to identify and conduct additional strategic sampling to evaluate the possibility that additional source materials are present and to update the O&M plan.

Regulatory standards have remained the same for all ground water contaminants of concern (COCs), except for 1,2-dichloroethene (1,2-DCE), chromium and fluoride, which have become less stringent. The vapor intrusion pathway has not been evaluated. Based on the current ground water conditions, vapor intrusion does not pose an immediate threat to human health under a commercial land use setting. However, the potential for a completed pathway exists and based on a screening-level assessment could pose unacceptable risks under the current land use. The PRPs and EPA will further assess this pathway and determine if additional measures are needed to ensure protectiveness. No other information has come to light that could call into question the protectiveness of the remedy.

Conclusion

The remedy for OU1 currently protects human health and the environment in the short term because no human exposure pathways to contaminated ground water currently exist. However, in order for the remedy to be protective in the long term, the potential risk from vapor intrusion needs to be further assessed.

The remedy for OU2 currently protects human health and the environment in the short term because no human exposure pathways to contaminated ground water currently exist. However, in order for the remedy to be protective in the long term, the potential risk from vapor intrusion needs to be further assessed.

Because the remedial actions at all OUs are short-term protective due to no human exposure pathways to contaminated ground water, the remedy is short-term protective. In order for the Site to be protective in the long term, the potential risk from vapor intrusion needs to be further assessed.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Harris Corp. (Palm Bay Plant)		
EPA ID: FLD000602334		
Region: 4	**State:** FL	**City/County:** Palm Bay/Brevard County
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Johnny Zimmerman-Ward and Ryan Burdge		
Author affiliation: Skeo Solutions		
Review period: 06/11/2013 – 02/03/2014		
Date of site inspection: 08/13/2013		
Type of review: Policy		
Review number: 3		
Triggering action date: 02/03/2009		
Due date *(five years after triggering action date)*: 02/03/2014		

Five-Year Review Summary Form (continued)

Issues/Recommendations

Issues and Recommendations Identified in the Five-Year Review:

OU(s): OU1 and OU2	Issue Category: Changed Site Conditions			
	Issue: A site-specific vapor intrusion assessment has never been conducted.			
	Recommendation: Conduct a site-specific vapor intrusion assessment in accordance with the most recent EPA vapor intrusion guidance.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	02/03/2015

Protectiveness Statements

Operable Unit:	*Protectiveness Determination:*
OU1	Short-term Protective

Protectiveness Statement:
The remedy for OU1 currently protects human health and the environment in the short term because no human exposure pathways to contaminated ground water currently exist. However, in order for the remedy to be protective in the long term, the potential risk from vapor intrusion needs to be further assessed.

Operable Unit:	*Protectiveness Determination:*
OU2	Short-term Protective

Protectiveness Statement:
The remedy for OU2 currently protects human health and the environment in the short term because no human exposure pathways to contaminated ground water currently exist. However, in order for the remedy to be protective in the long term, the potential risk from vapor intrusion needs to be further assessed.

Sitewide Protectiveness Statement

Protectiveness Determination:	*Addendum Due Date (if applicable):*
Short-term Protective	Click here to enter date.

Protectiveness Statement:
Because the remedial actions at all OUs are short-term protective due to no human exposure pathways to contaminated ground water, the remedy is short-term protective. In order for the Site to be protective in the long term, the potential risk from vapor intrusion needs to be further assessed.

Five-Year Review Summary Form (continued)

Environmental Indicators
- Current human exposures at the Site are under control. *- Current ground water migration is under control.*

Are Necessary Institutional Controls in Place?
☒ All ☐ Some ☐ None

Has EPA Designated the Site as Sitewide Ready for Anticipated Use?
☒ Yes ☐ No

Has the Site Been Put into Reuse?
☒ Yes ☐ No

Third Five-Year Review Report
for
Harris Corporation (Palm Bay Plant) Superfund Site

1.0 Introduction

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Skeo Solutions, an EPA Region 4 contractor, conducted the FYR and prepared this report regarding the remedy implemented at the Harris Corp. (Palm Bay Plant) Superfund site (the Site) in Palm Bay, Brevard County, Florida. The EPA's contractor conducted this FYR from June 2013 to February 2014. EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site. Florida Department of Environmental Protection (FDEP), as the support agency representing the State of Florida, has reviewed all supporting documentation and provided input to EPA during the FYR process.

This is the third FYR for the Site. The triggering action for this policy review is the previous FYR. The FYR is required due to the fact that hazardous substances, pollutants or contaminants

remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of two operable units (OUs). This FYR report addresses all site OUs.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
EPA discovered contamination of soil and ground water at the Site	September 1, 1980
PRP signed consent order	December 1983
EPA proposed the Site for listing on the National Priorities List (NPL)	April 10, 1985
EPA added the Site to the NPL	July 22, 1987
EPA initiated remedial investigation/feasibility study (RI/FS) for OU1	March 31, 1988
EPA completed RI/FS and issued Record of Decision (ROD) for OU1	June 28, 1990
PRP signed consent decree PRP initiated remedial design for OU1	October 25, 1991
EPA issued Administrative Order on Consent for OU1 EPA initiated RI/FS for OU2	January 23, 1992
EPA issued Explanation of Significant Differences (ESD) for OU1	December 1, 1992
PRP completed RI/FS for OU2 EPA issued ROD for OU2	February 15, 1995
EPA issued ESD for OU2	December 8, 1995
PRP completed remedial design for OU1	May 30, 1996
PRP completed remedial action for OU1	July 12, 1996
PRP initiated remedial design for OU2	November 20, 1996
PRP signed consent decree	January 27, 1997
PRP completed remedial design for OU2 PRP initiated remedial action for OU2	May 21, 1997
PRP completed remedial action for OU2 EPA determined the Site achieved construction completion	July 2, 1998
PRP placed OU2 pump-and-treat system on standby	June 13, 2000
PRP placed OU1 pump-and-treat system on standby	October 21, 2002
EPA completed first FYR	February 3, 2004
EPA completed second FYR	February 3, 2009
EPA issued ESD for OU2	February 19, 2009
EPA issued Ready for Reuse determination	November 2009

3.0 Background

3.1 Physical Characteristics

The Site is located in eastern central Florida approximately three miles from the Atlantic Ocean (Figure 1). The Site encompasses approximately 310 acres along 2400 Palm Bay Road, within the City of Palm Bay, Brevard County, Florida. The Site consists of two OUs, divided by Palm Bay Road: OU1 consists of the Harris Government Communications Systems Division (formerly Electronic Systems Sector) south of the road and OU2 consists of the Intersil Corporation property (formerly the Harris Semiconductor Complex) north of the road (Figure 2).

The Harris Government Communications Systems Division includes approximately 170 acres. Brevard County Parcel IDs for OU1 are 28-37-23-FN-00000.0-000F.00 and 28-37-23-FN-00005.0-0001.00. The Intersil Corporation property includes approximately 140 acres. The Brevard County Parcel IDs for OU2 are 28-37-23-00-00250.0-0000.00 and 28-37-23-00-00256.0-0000.00.

Ground water beneath the Site has been contaminated due to releases of volatile organic compounds (VOCs). VOCs have also been detected in wells on the Palm Bay Utilities (PBU) site located adjacent to the southern boundary of the Harris Corporation facility. PBU provides potable water supply as well as sewage treatment and disposal for residents of Palm Bay. The Site is within the drainage basin of Turkey Creek and its tributaries, which extend to the southwest, south and southeast.

The Surficial Aquifer System (SAS) underlies the Site. An unconfined water table zone exists within the uppermost 40 to 60 feet of unconsolidated sediments. The water table is generally within three to four feet below land surface (bls) at OU2 and drops to over nine feet bls in the southern portion of OU1 due to the PBU well field's influence.

The water-table zone is underlain by a marine sequence of terrace deposits consisting predominantly of clay to silt-size sediments with inter-bedded lenses of sand and shell. The lower layer is approximately 20 to 40 feet thick and exists under leaky artesian conditions. The leaky artesian layer is the principal water-producing zone for the PBU water supply wells located south of OU1.

Three monitoring zones have been identified at the Site. An upper zone is monitored by a network of wells approximately 15 to 20 feet deep. An intermediate zone is monitored by wells installed to a depth of approximately 40 feet within a fairly continuous shell bed. A deep zone is monitored by wells completed to a depth of approximately 80 feet within the leaky artesian layer.

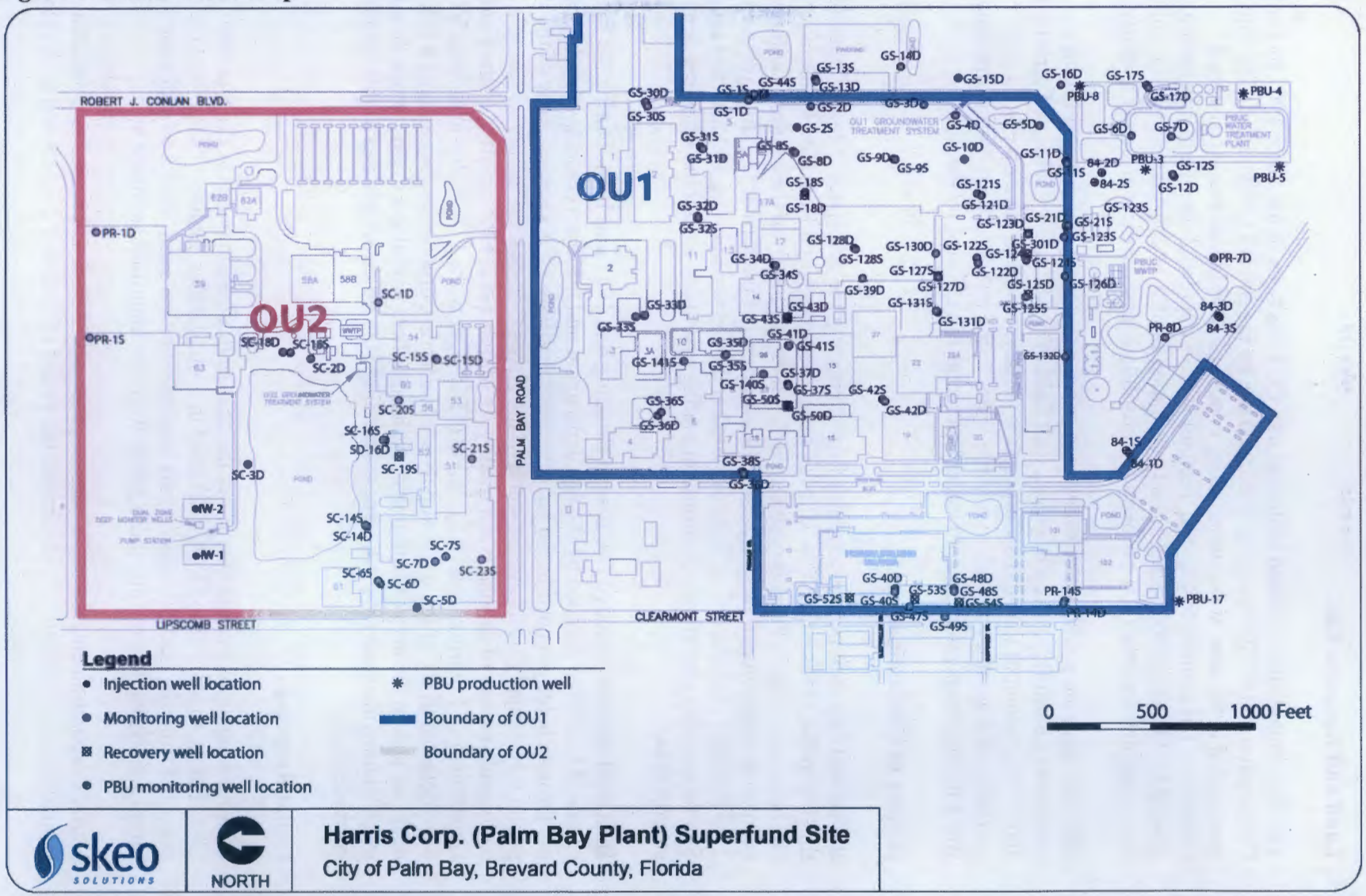
Beneath the SAS, the Hawthorn Group forms a regional confining layer. The Hawthorn Group sediments are predominantly marine clay and silt deposits with relatively low hydraulic conductivity. The artesian Floridan Aquifer System is present beneath the Hawthorn Group at a depth of approximately 250 feet.

Prior to development of the Palm Bay well field in the 1950s, regional ground water movement in the surficial aquifer was to the east toward the Indian River Lagoon. Shallow ground water also discharged locally to drainage ditches and to Turkey Creek and its tributaries. After development of the well field, ground water flow direction in the surficial aquifer shifted to the south/southeast across the Site. Water supply withdrawals from the lower producing zone in the surficial aquifer create a vertical gradient between the upper and lower layer. The vertical gradient results in a strong vertical component of ground water flow within the well field's cone of depression.

Figure 1: Site Location Map

Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site. This map was created using maps from L.S. Sims & Associates Annual Reports.

3.2 Land and Resource Use

The Site remains in continued industrial use. OU1 has been in use since 1967 by Harris Corporation and OU2 remains in continued use by the Intersil Corporation. The Site is surrounded to the east, west and north by commercial and other industrial-zoned properties. The Florida Institute of Technology has expressed interest in purchasing several buildings at OU2. The Harris Corporation facility is constructing a large multi-story complex on their OU1 property to consolidate leased offices from off property.

PBU provides the public water supply and sewage treatment and disposal for the residents of Palm Bay. The PBU has a well field of producing wells located directly south and downgradient of the Harris Corporation facility. However, these wells do not currently, and are not planned, to provide water to the public system. Public drinking water in the area is pumped from upgradient areas not affected by the Site.

3.3 History of Contamination

Radiation Corporation, an electronics firm supporting the aerospace industry, operated at the Site in the 1950s and 1960s. Harris Corporation purchased Radiation Corporation and has been operating in Palm Bay since 1967. All expansion from the original facilities has been on to undeveloped property, with the exception of the former Building 100 area. Two previous manufacturing firms operated at the former Building 100 area and used the Site for painting operations, a chromium plating operation, a machine shop and drum storage area.

Historical releases included two fires in Building 6 in 1967 and 1974. During the fires, chemical vats were dumped by the fire department and the drum contents were flushed out through holes punched in the building floor. In 1980, EPA sampled some of the PBU public water supply wells that lie south of the Harris Corporation facility as part of a nationwide survey of ground water quality. In March 1982, EPA reported to the Florida Department of Environmental Regulation (FDER), now the FDEP, that numerous VOCs were detected in six of the water supply wells. Harris Corporation documented a 1986 acid line leak in the area of Building 4. Although there was also a drum storage area and metal plating/machine shop adjacent to Building 100, no direct releases in this area have been reported.

3.4 Initial Response

EPA investigations evaluated whether the acid neutralization ponds at the Site were contributing sources of the VOCs detected in ground water. Sediment samples were collected from the neutralization ponds and the retention pond. Based on sediment sample analytical test results, these ponds were not identified as source areas.

Harris Corporation entered into a consent order with FDER and agreed to conduct a ground water investigation to determine the extent of chemical impacts and to develop

and implement a ground water restoration program. Harris Corporation completed a site characterization and in 1985 began treating OU1 ground water using an air stripper.

In 1985, a leaking underground solvent line was discovered during the course of construction activities at OU2. VOCs were discovered in soil and ground water samples collected at the Site. In response, approximately 238 cubic yards of soil were excavated and transported to Emelle, Alabama for disposal by Chemical Waste Management, Inc. In November 1985, a ground water extraction and treatment system was installed, pilot tested and then used to remove and treat approximately 8,000 gallons of impacted ground water in OU2. The treatment system included a bag filter, an activated carbon adsorption system and a heated air stripping tower.

The Site was proposed for the National Priorities List (NPL) on April 10, 1985, and became a final NPL site on July 22, 1987.

3.5 Basis for Taking Action

In January 1992, Harris Corporation entered into an Administrative Order on Consent with EPA to conduct a remedial investigation/feasibility study (RI/FS) Review and Modification. The risk assessment considered the potential impacts to human health and the environment due to potential exposure to contaminants in OU1 and OU2 soil, sediment, surface water and ground water. The results indicated that drinking untreated ground water at OU1 and OU2 poses an unacceptable human health risk due to elevated concentrations of metals and VOCs. EPA concluded that soil, sediment and surface water did not contain contaminants at concentrations that would cause unacceptable risks to human health or the environment. Primary contaminants considered in the RI/FS are listed in Table 2.

Table 2: Contaminants Included in the OU1 and OU2 Risk Assessment

OU1	OU2
Trichloroethene (TCE)	DCE
Tetrachloroethene (PCE)	TCE
Vinyl chloride	PCE
1,1-Dichloroethene	Vinyl chloride
cis-1,2-Dichlorethene (1,2-DCE)	Manganese
Methylene chloride	
1,2-dichorobenzene	
Ethyl benzene	
Lead	
Chromium	
Copper	
Fluoride	

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

EPA decided to address the Site as two management units. OU1 includes ground water at the Harris Government Communications Systems Division (formerly Electronic Systems Sector) facility on the south side of Palm Bay Road, including the former Building 100 area. OU2 includes ground water at the former Harris Semiconductor Sector facility north of Palm Bay Road. The Intersil Corporation currently occupies OU2. Each OU had a separate ground water recovery and treatment system.

OU1

On June 28, 1990, EPA issued a Record of Decision (ROD) for OU1 identifying the selected remedy. The ROD did not specify remedial action objectives (RAOs). The selected remedy required modification to the existing ground water extraction and treatment system and consists of the following remedial components:

- Continued operation of the existing extraction, treatment and disposal system.
- A design analysis for plume containment and treatment.
- Modification of the extraction, treatment and disposal system based on results of the design analysis.
- Continued sampling and monitoring of the cleanup.
- A review of the system by EPA and FDEP within five years after the onset of the remedial action.

The OU1 ROD specified 13 organic compounds and five inorganic compounds as contaminants of concern (COCs) and required that the Harris Corporation evaluate the

effectiveness of the existing pump-and-treat remedy (Table 3). EPA issued an Explanation of Significant Differences (ESD) in December 1992, adding benzene and PCE as COCs and updating cleanup goals for other COCs. EPA issued a second ESD in 2009 requiring institutional controls in the form of a Florida Ground Water Delineated Area as part of the ground water remedy for the Site.

OU2

OU2 addresses the ground water contamination associated with the Intersil facility. The major components of the selected remedy for OU2 in the February 15, 1995 ROD included:

- Continued operation of the existing extraction, treatment and disposal system.
- Extraction of contaminated ground water from the surficial aquifer.
- Treatment of the extracted ground water by air stripping.
- Injection of the treated ground water into the Floridan Aquifer.
- Elimination of recovery well SC-TS4.
- Ground water monitoring.

As specified in the ROD, the preferred remedial alternative was continued operation of the pump-and-treat remedy. The ROD also specified the construction of a new monitoring well and the decommissioning of one of the active recovery wells. Six organic compounds (PCE, TCE, 1,2-DCE, vinyl chloride, benzene and bis-(2-ethylhexyl) phthalate) and one inorganic contaminant (manganese) were identified as COCs. EPA issued an ESD in December 1995 which removed benzene and bis-(2-ethylhexyl) phthalate as COCs. The ESD also removed manganese as a contaminant requiring ground water treatment and limited manganese monitoring to one well (SC-2S). EPA issued a second ESD in 2009 requiring institutional controls in the form of a Florida Ground Water Delineated Area as part of the ground water remedy for the Site.

Table 3: COCs and Cleanup Goals

COC	Cleanup Goals (µg/L)
OU1	
Vinyl chloride	1
TCE	3
PCE	3
1,1-Dichloroethene	7
cis-1,2-DCE	70
Methylene chloride	5
1,2-Dichlorobenzene	10
Ethyl benzene	15
Lead	15
Chromium	50
Copper	1,000
Fluoride	2,000
OU2	
cis-1,2-DCE	70

COC	Cleanup Goals (µg/L)
PCE	3
TCE	3
Vinyl chloride	1
Manganese	50

4.2 Remedy Implementation

OU1

Harris Corporation completed the remedial design in 1993 and confirmed that the existing pump-and-treat remedy was appropriate and effective for the Site. EPA issued a construction completion determination on July 1, 1998. There were 14 recovery wells in operation at OU1.

The extracted ground water flowed through a network of pipes to a treatment system, which removed VOCs using a packed column air stripping tower. Tower effluent flowed by gravity into the holding tank and was then pumped to a water reuse system on the Intersil Corporation portion of the Site. After use as process water, the treated ground water was disposed of by deep well injection into the lower Floridan Aquifer.

In January 1996, following EPA approval, recovery well GS-54S was deactivated in the former Building 100 area after achieving site remedial goals. In June 2000, the remaining two former Building 100 area recovery wells (GS-52S and GS-53S) were shut down after meeting the performance criteria specified in the ROD. Recovery well GS-131S was deactivated in February 2001 after meeting remedial goals.

Based on evaluations of the natural attenuation processes occurring at the Site, decreased contaminant concentrations in monitoring well samples, and the relatively small amount of mass being removed from the ground water at OU1, EPA approved the temporary deactivation of the OU1 ground water treatment system on April 2, 2002. On October 21, 2002, the OU1 system was placed on standby mode with continued monitoring of ground water to collect data necessary to demonstrate the long-term effectiveness of natural attenuation.

In addition to the system operating on the Harris Corporation facility, there is a ground water extraction and treatment system ongoing at the PBU facility. Currently, water from four production wells (PBU-3, PBU-5, PBU-8 and PBU-17) is pumped to an air stripper. The stripper effluent is mixed with water from other PBU production wells before undergoing the standard water purification process prior to public consumption.

OU2

Harris Corporation entered into a consent decree with EPA in November 1996 to complete a remedial design and remedial actions at OU2. Harris completed the remedial design on May 27, 1997. The remedial action began on May 27, 1997, and was

completed on July 2, 1998. EPA issued a construction completion determination on July 1, 1998. Annual Performance Reviews have been prepared and submitted to EPA since 1994.

The OU2 remediation system originally consisted of 11 shallow (15-foot) recovery wells and one intermediate depth (40-foot) recovery well. The shallow wells are situated on the eastern and southern sides of the retention pond in the central portion of OU2. In June 1993, recovery well SC-TS23 was deactivated. In July 1995, EPA shut down three shallow wells on the eastern side of the retention pond (SC-TS4, SC-TS-6 and SC-TS9), due to their meeting the ROD's specified performance criteria. Recovery wells SC-TS13 and SC-TS16 were deactivated in December 1996 and recovery well SC-TS32 was deactivated in June 1997.

Based on decreased contaminant concentrations in monitoring well samples and the relatively small contaminant mass removed from the ground water at OU2, EPA approved the temporary deactivation of the OU2 ground water treatment system on June 5, 2000. On June 13, 2000, the OU2 system was placed on standby mode with continued monitoring of the deactivated recovery wells and adjacent monitoring wells. If this system is restarted, a use for the treated water will need to be determined.

4.3 Operation and Maintenance (O&M)

Monitoring wells and the inactive treatment systems are checked for secure locks and the Site is inspected during the annual sampling event. Prior to the shutdown of the pump-and-treat system, the OU1 treatment system influent flow rate was approximately 150 gallons per minute (gpm). The average total VOC concentration in the influent decreased from 200 ug/L (micrograms per liter) in 1998 to 45 µg/L in October 2002, prior to system deactivation. Monthly samples are also collected from four of the PBU production wells and the PBU air stripper influent/effluent. Annual O&M costs for both OUs are shown in Table 4. O&M costs for OU1 were estimated in the ROD at $96,000 annually. The O&M plan is not up to date and does not include the MNA remedy.

Table 4: Annual O&M Costs

Date	Total Cost (Rounded to the nearest 1,000)
2008	$78,000
2009	$63,000
2010	$54,000
2011	$53,000
2012	$37,000
January - June 2013	$25,000

5.0 Progress Since the Last Five-Year Review

The protectiveness statement from the second FYR for the Site stated the following:

"The remedy at the Site currently protects human health and the environment because contaminated ground water is not being used for potable purposes."

The 2009 FYR included four issues and recommendations. This report summarizes each recommendation and its current status below.

Table 5: Progress on Recommendations from the 2009 FYR

Section	Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
5.1	Secure and label all ground water monitoring wells.	PRP	8/1/2009	Completed	6/12/2009
5.2	Determine reason for spikes of TCE through supplemental sampling.	PRP	8/1/2009	Completed	6/29/2009
5.3	Cut off abandoned wells at ground level.	PRP	8/1/2009	Completed	6/12/2009
5.4	Continue monitoring and annual reporting at OU1 and OU2, determine natural attenuation rates for OU1 and OU2, determine site cleanup time, and determine if it is necessary for PBU to continue to pump and treat ground water.	PRP	8/1/2009	Completed	6/29/2009

5.1 Secure and Label Monitoring Wells

The PRPs secured and labeled all ground water monitoring wells, as directed by EPA.

5.2 Assess TCE Spikes

Subsequent to the previous FYR, the PRPs conducted additional sampling to determine the cause of occasional contaminant increases and believe that the spikes are the result of the cyclical nature of the bioattenuation processes. However, the increased contaminant concentrations could be due to residual source material in the vadose zone and to the influence of variable pumping in the downgradient utility wells. The PRPs will work with EPA to conduct additional sampling and further evaluate the cause of the contaminant increases.

5.3 Remove Abandoned Wells

The PRPs cut off the abandoned ground water monitoring wells at ground level, as directed by EPA.

5.4 Continue Monitoring and Assess Need to Treat PBU Water

The PRPs continue to conduct required ground water monitoring and sampling of microbial populations associated with natural attenuation. Contaminant concentrations are generally declining, although less rapidly than previously believed. The estimated cleanup time of 2016 is no longer expected. The PRP has requested that pump-and-treatment of PBU ground water be terminated due to the lack of contaminants present.

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 4 initiated the FYR in June 2013 and scheduled its completion for February 2014. The EPA remedial project manager (RPM) Michaél Taylor led the EPA site review team, which also included EPA site attorney Stedman Southall, EPA community involvement coordinator (CIC) L'Tonya Spencer and contractor support provided to EPA by Skeo Solutions. In June 2013, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

In June 2013, EPA published a public notice in the *Orlando Sentinel* newspaper announcing the commencement of the FYR process for the Site, providing contact information for Michael Taylor and inviting community participation. The press notice is available in Appendix B. No one contacted EPA as a result of the advertisement.

EPA will make the final FYR Report available to the public. Upon completion of the FYR, EPA will place copies of the document in the designated site repository: Franklin Degroodt Memorial Library, 6475 Minton Road, Palm Bay, Florida 32909.

6.3 Document Review

This FYR included a review of relevant, site-related documents, including the RODs, ESDs, remedial action reports and recent monitoring data. Appendix A presents a complete list of the documents reviewed.

ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal

environmental or state environmental or facility siting laws that specifically address a hazardous substance, remedial action, location or other circumstance found at a CERCLA site. Relevant and appropriate requirements are those standards that, while not "applicable," address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are more stringent than federal requirements may be applicable or relevant and appropriate. To-be-considered criteria are non-promulgated advisories and guidance that are not legally binding but should be considered in determining the necessary remedial action. For example, to-be-considered (TBC) criteria may be particularly useful in determining health-based levels where no ARARs exist or in developing the appropriate method for conducting a remedial action.

Chemical-specific ARARs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish an acceptable amount or concentration of a chemical that may remain in, or be discharged to, the ambient environment. Examples of chemical-specific ARARs include maximum contaminant levels (MCLs) under the federal Safe Drinking Water Act (SDWA) and ambient water quality criteria enumerated under the federal Clean Water Act.

Action-specific ARARs are technology- or activity-based requirements or limits on actions taken with respect to a particular hazardous substance. These requirements are triggered by a particular remedial activity, such as discharge of contaminated ground water or in-situ remediation.

Location-specific ARARs are restrictions on hazardous substances or the conduct of the response activities solely based on their location in a special geographic area. Examples include restrictions on activities in wetlands, sensitive habitats and historic places.

Remedial actions are required to comply with the chemical-specific ARARs identified in the ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Ground Water ARARs

The 1993 ROD identified remedial goals for ground water COCs based on the more stringent of the federal SDWA national primary drinking water standards and the Florida drinking water standards. Cleanup goals from the RODs and ESDs were compared to current standards (Table 6). Current standards remain the same or are less stringent for all COCs.

Table 6: Ground Water ARARs Review

COCs	1992 ESD ARARs (ug/L)	Current[a] ARARs (ug/L)	ARARs Changed?
Vinyl chloride	1	1	No
TCE	3	3	No
PCE	3	3	No

COCs	1992 ESD ARARs (ug/L)	Current[a] ARARs (ug/L)	ARARs Changed?
1,1-Dichloroethene	7	7	No
1,2-DCE	70	70	No
Methylene chloride	5	5	No
1,2-Dichlorobenzene	10	600	Less stringent
Ethyl benzene	15	700	Less stringent
Lead	15[b]	15	No
Chromium	50[c]	100	Less stringent
Copper	1,000	1,000	No
Fluoride	2,000	4,000	Less stringent

a. Florida Drinking Water MCLs are available online at: http://www.dep.state.fl.us/water/drinkingwater/standard.htm
b. TBC cleanup goal
c. Secondary Drinking Water Standards

Institutional Control Review

This FYR included a review of the deed information pertaining to the Site, recorded at the Brevard County Public Records Office and found the in Table 7.

Table 7: Deed Documents from Brevard County Public Records Office

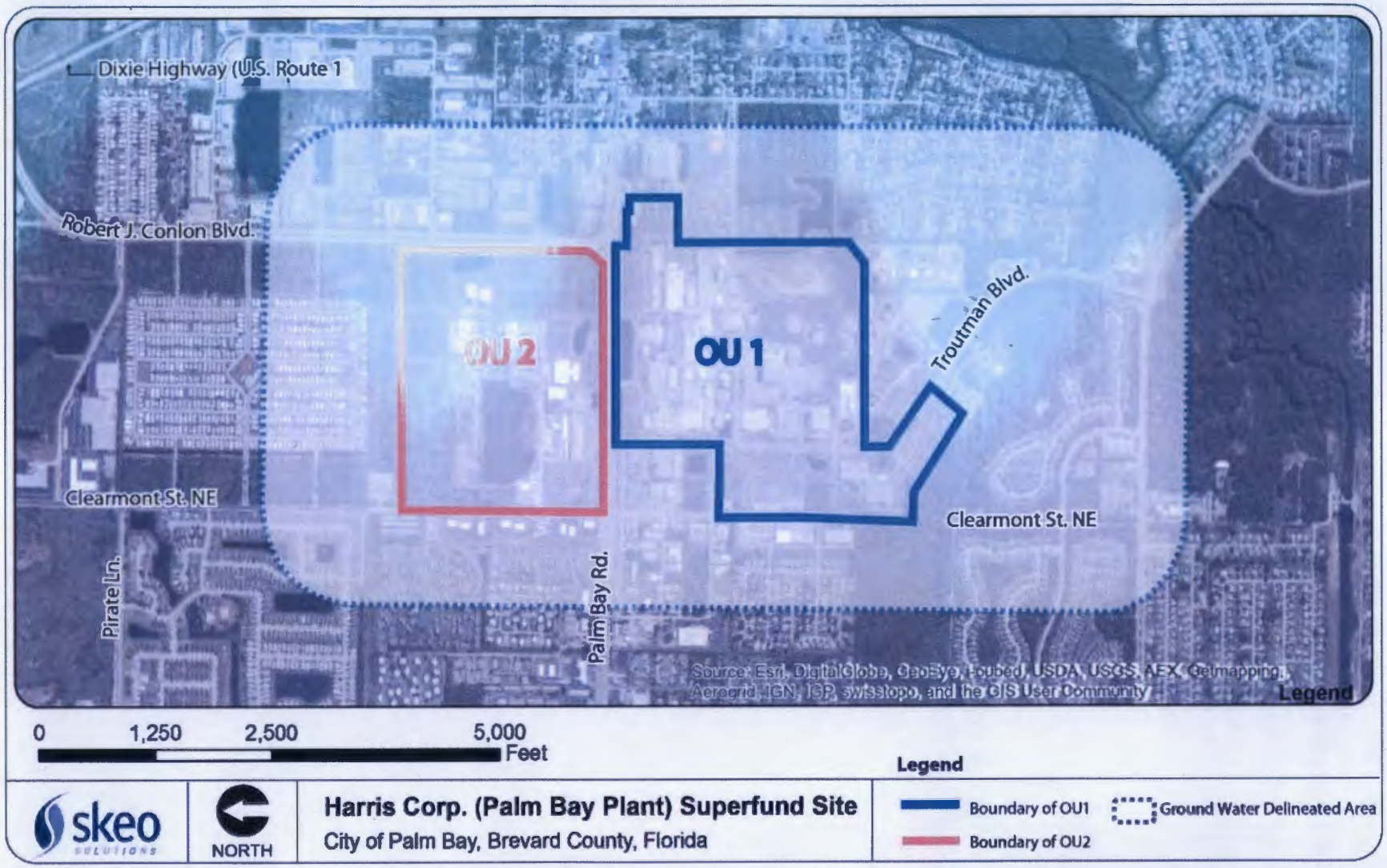
Date	Type of Document	Description	Book #	Page #
1969	Warranty Deed	Transfers ownership of a portion of the Site from Universal Marion Corporation to Radiation Incorporated	1076	1043
1970	Warranty Deed	Transfers ownership of a portion of the Site from Soroban, Inc. to Radiation Incorporated	1145	697
1972	Certificate of Merger	Merges Radiation Incorporated into Harris-Intertype Corporation	1436	678
1982	Easement	Easement to Florida Power and Light	2408	2885
1999	Special Warranty Deed	Transfers ownership of a portion of the Site from Harris Corporation to Intersil Corporation	4055	0640
2007	Special Warranty Deed	Transfers ownership of a portion of the Site from Harris Corporation to Intersil Corporation	5765	3488
2007	Declaration	Declaration of easements: drainage facilities, utilities, electrical power, cooling towers, monitoring wells, air scrubber and security fence	5764	6216

Table 8 lists the institutional controls associated with areas of interest at the Site. Figure 3 shows the extent of the institutional controls at the Site.

Table 8: Institutional Control (IC) Summary Table

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Instrument in Place
Ground Water	Yes	No	28-37-23-FN-00000.0-000F.00 and 28-37-23-FN-00005.0-0001.00	Restrict installation of ground water wells	The Site lies within a Florida Delineated Ground Water Area, which restricts well placement.[1]
1. Florida's ground water delineation information is available online at: http://www.dep.state.fl.us/water/groundwater/delineate.htm.					

Figure 3: Florida Ground Water Delineated Area Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

6.4 Data Review

This FYR included a review of historic ground water monitoring data, including data for 2009, 2010, 2011 and 2012. OU1 and OU2 monitoring wells are sampled annually in November and the PBU unused production wells are sampled monthly. Three monitoring zones include: an upper zone is monitored by a network of wells approximately 15 to 20 feet deep; an intermediate zone of wells installed to a depth of approximately 40 feet within a fairly continuous shell bed; and a deep zone of wells at a depth of approximately 80 feet within the leaky artesian layer.

Results generally indicate that natural attenuation processes are occurring and concentrations are decreasing. Contaminant concentrations in the four PBU wells are consistently non-detections or below the cleanup goals. Current contaminant plumes are depicted in Figures 4-6. The plumes as of 1984 are included in Figures 5 and 6 for reference.

During the 2012 sampling event, concentrations showed a continued general decreasing trend, but contaminant rebounding was evident in samples from a few monitoring wells in the intermediate and deep zones at OU1, notably intermediate well GS-141S (Table 9). Similarly, at OU2, COC concentrations have fluctuated or increased in samples from SC-16S and SC-19S (Table 9). At SC-19S, concentrations of TCE, 1,2-DCE and vinyl chloride have steadily increased since 2010. Based on sampling of the microbial communities since the last FYR, these increases are believed to be attributable to the fluctuation of microbial populations that drive the natural attenuation process. Charts of contaminant concentrations are included in Appendix F.

Provided further increases in concentrations are not observed at well SC-19S, microbial populations are sufficient to reduce the concentrations detected. VOC concentrations are expected to decrease during 2013 in response to anticipated increases in microbial populations noted in 2012 sampling. Microbial populations will continue to be monitored in future monitoring events. EPA and the PRPs are considering additional sampling efforts to evaluate the possibility that the observed spikes are due to remaining source material.

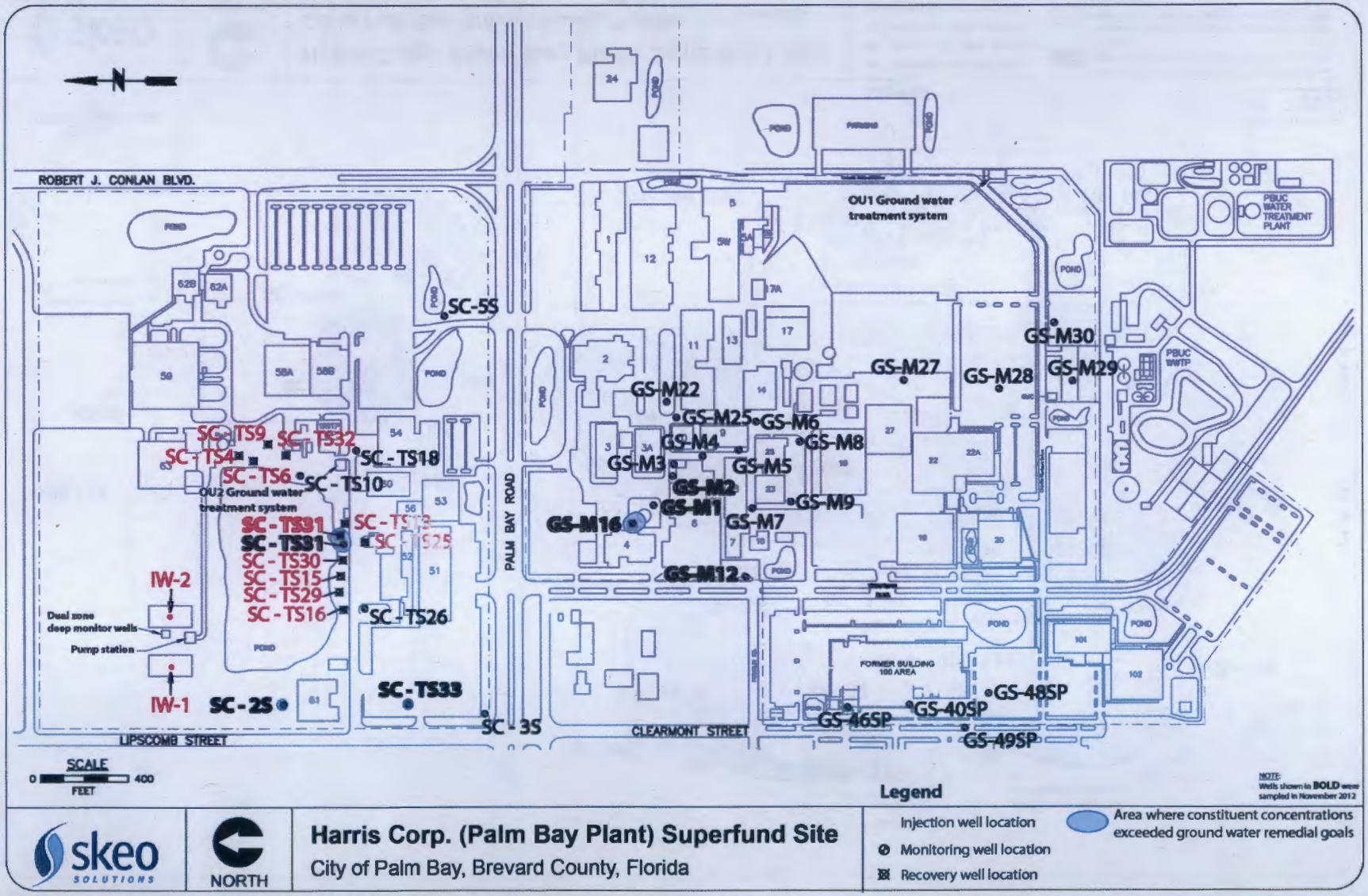
Table 9: VOC Results for Wells with Highest Concentrations

Well	Date	PCE	TCE	1,2-DCE	Vinyl chloride
	(Goal)	3 µg/L	3 µg/L	70 µg/L	1 µg/L
GS-141S (OU1 Intermediate)	Nov-06	**19**	**75**	**72**	**17**
	Nov-07	**12**	**54**	48	**8**
	Nov-08	**16**	**44**	23	**10**
	Dec-09	**10**	**32**	21	**7.3**
	Nov-10	**8.2**	**38**	24	**8.1**
	Nov-11	**4.2**	**110**	31	**17**
	Nov-12	**11**	**22**	15	**5.1**
SC-16S	Nov-06	<0.50	**190**	16	**1.2**

Well	Date	PCE	TCE	1,2-DCE	Vinyl chloride
	(Goal)	3 µg/L	3 µg/L	70 µg/L	1 µg/L
(OU2 Intermediate)	Nov-07	**12.0**	**1,300**	**110**	**2.9**
	Nov-08	<0.50	**84**	**84**	<0.50
	Dec-09	<0.50	**380**	55	<0.50
	Nov-10	<0.50	**280**	**74**	**5.0**
	Nov-10 (dup)	<0.50	**280**	**73**	**4.9**
	Nov-11	<0.35	**65**	17	**2.0**
	Nov-11 (dup)	<0.35	**59**	15	**2.1**
	Nov-12	<0.50	**270**	**76**	**6.0**
SC-19S (OU2 Intermediate)	Nov-06	<0.50	1.1	1.6	**4.2**
	Nov-07	<0.24	**3.3**	2.3	**2.2**
	Nov-08	<0.50	2.0	1.4	**1.8**
	Nov-08 (dup)	<0.50	2.0	1.4	<0.50
	Dec-09	<0.50	**3.3**	16.0	**14**
	Dec-09 (dup)	<0.50	2.4	13.0	**11**
	Nov-10	<0.50	**6.6**	55	**37**
	Nov-11	<0.35	**13.0**	**140**	**63**
	Nov-12	<0.50	**25**	**390**	**120**

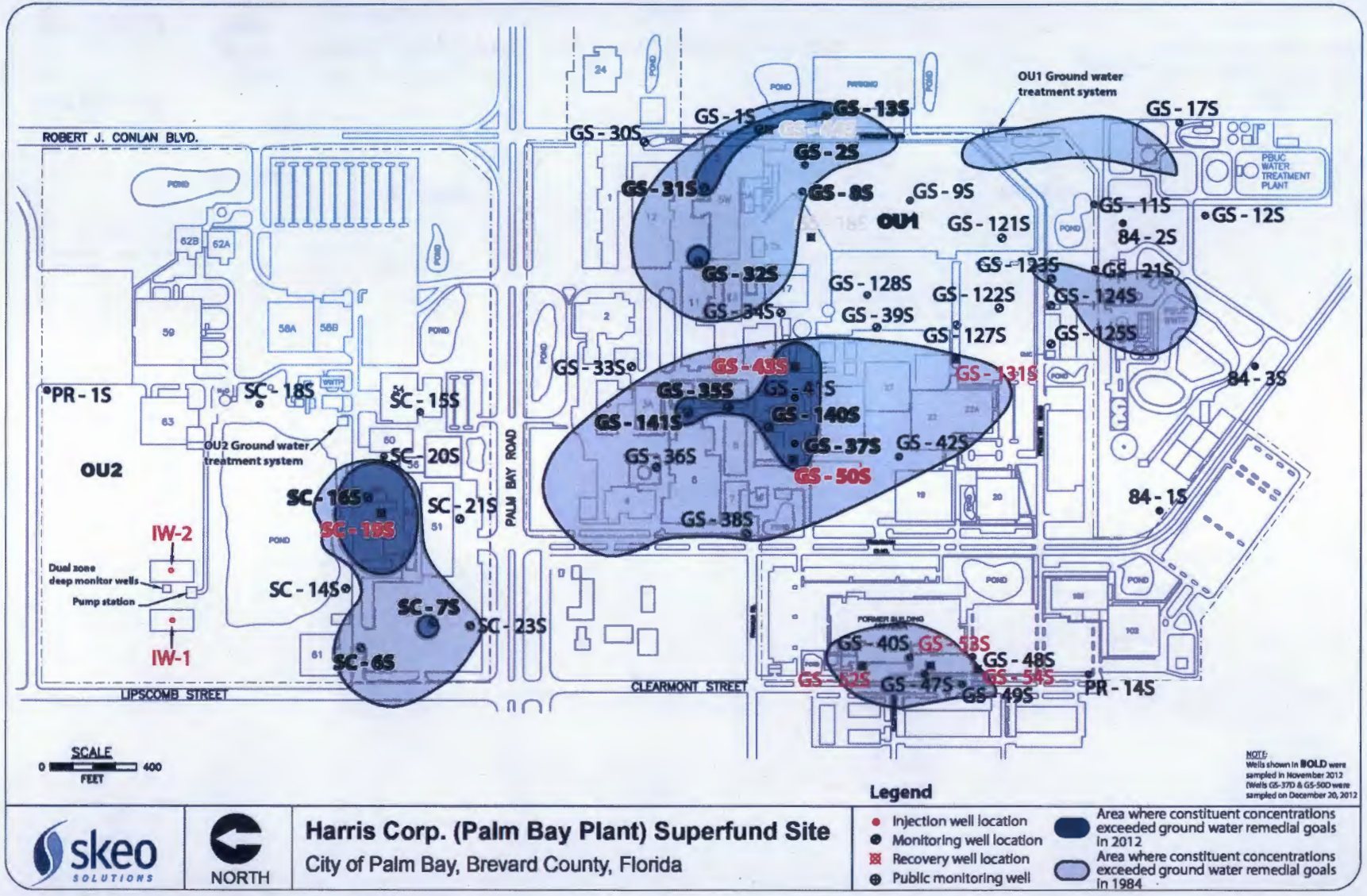
Bold indicates exceedance of cleanup goals

Figure 4: 2012 Shallow Zone Contaminant Plume



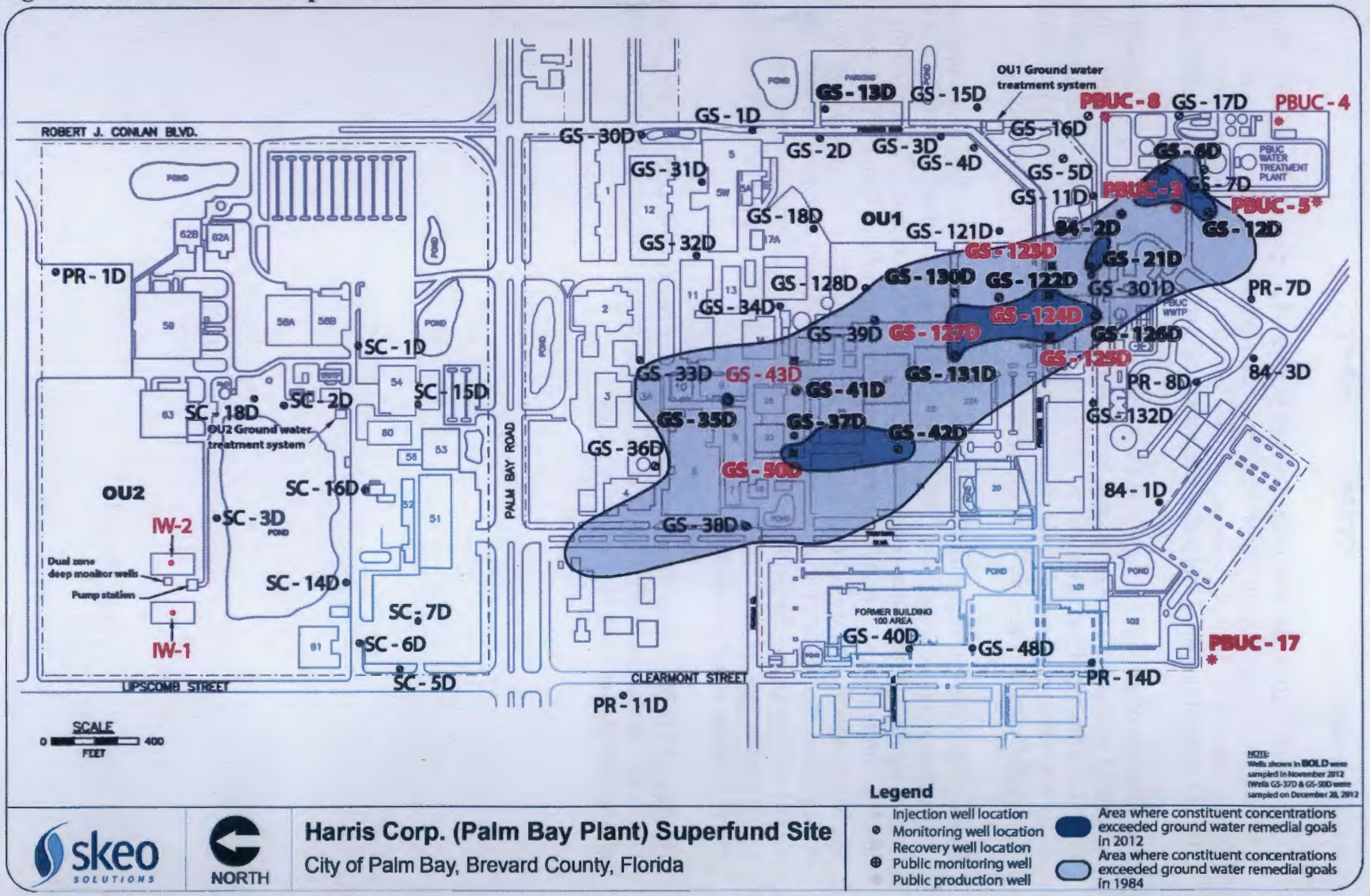
Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site. This map was created using maps from L.S. Sims & Associates Annual Reports.

Figure 5: 1984 and 2012 Intermediate Zone Contaminant Plume



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site. This map was created using maps from L.S. Sims & Associates Annual Reports.

Figure 6: 1984 and 2012 Deep Zone Contaminant Plume



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site. This map was created using maps from L.S. Sims & Associates Annual Reports.

6.5 Site Inspection

On August 13, 2013, the site inspection was performed by the following participants: Michael Taylor and Noman Ahsanuzzaman of EPA Region 4; Larry Sims and Robert Schatzman of L.S. Sims & Associates; Costa Triantafyllidis and Ladarius Chance of the Harris Corporation; and Johnny Zimmerman-Ward and Ryan Burdge of Skeo Solutions.

The majority of the approximately 310-acre Site is located in a manufacturing facility and is secured with gates, security guards, and requires an escort and badge to enter. The Site is well-maintained. Photographs were taken only of the pertinent site features, including wells and inactive pump-and-treat systems. The site inspection checklist is included in Appendix D and photographs from the inspection are included in Appendix E.

Monitoring wells found on site were all secured and labeled. The PBU air stripper and wells are in good working order. The offline OU1 system is fenced and locked and would require significant maintenance to restart. The offline OU2 system is located on the Intersil Corporation's property and is in slightly better condition than the OU1 system, but would also require work to restart. The PRPs indicated that if additional pumping were needed, they would prefer to install new, more efficient treatment systems. Based on this preference and the evidence supporting the natural attenuation of remaining contamination, the PRPs intend to formally request that EPA approve the decommission of the existing, inactive systems.

On August 12, 2013, Skeo Solutions staff visited the designated site repository, Franklin Degroodt Memorial Library, as part of the site inspection. Staff confirmed that relevant site documents are available for public access.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the current landowners and the regulatory agencies involved in Site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. All of the interviews took place during the site inspection on August 13, 2013. The interviews are summarized below. Appendix C provides the complete interviews.

Michael Taylor: Mr. Taylor is the site RPM for EPA. He noted that although the ground water cleanup goals have not been met, progress is indicating a downward trend for COCs. The reuse/redevelopment of the Intersil Corporation property has been positive. The Florida Institute of Technology is in the process of purchasing five acres with building facilities for their campus use. The Harris Corporation facility is constructing a large multi-story complex on their property to consolidate leased offices from off property.

Costa Triantafyllidis: Mr. Triantafyllidis is the site manager for Harris Corp. He believes the remediation has been effective through monitored natural attenuation (MNA) and notes the data indicate COCs are decreasing. He believes the remedy at the Site is protective of human health and the environment. He expressed no problems with the Site.

Steven Browne: Mr. Browne is the Environmental Health & Safety Supervisor at the Intersil Corporation. Mr. Browne indicated that the remedy seems to be working well and the data indicate that COC levels are decreasing.

Larry Sims: Mr. Sims is with L.S. Sims and Associates, the O&M contractor for the Site. Mr. Sims believes the remedy is functioning as intended, although contaminants are not attenuating as quickly as had been anticipated. He did not note any problems or concerns with the Site.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

Yes, the remedies for OU1 and OU2 are functioning as intended by the decision documents. The ground water plume is effectively contained and contaminant concentrations are declining. The original pump-and-treatment of contaminated ground water was suspended for both OUs and natural attenuation is removing contaminants from the ground water. The Site is located in a Florida Ground Water Delineated Area, which restricts potable well placement.

Although natural attenuation is occurring, occasional contaminant spikes are detected in the remaining hot spots. The PRPs conducted sampling of the microbial communities and believe that the observed contaminant spikes are the result of fluctuations in the microbial populations. However, there is a possibility that the contaminant spikes are due to residual source material in the vadose zone. The O&M plan is not up to date and does not include the MNA remedy. The PRPs will work with EPA to identify and conduct additional strategic sampling to evaluate the possibility that additional source materials are present and to update the O&M plan. If necessary, EPA and the PRPs will develop a plan to enhance the contaminant removal in order to attain cleanup goals sooner.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Ground water cleanup goals are based on ARARs, all of which have remained the same, except for 1,2-DCE, chromium and fluoride, which have become less stringent. There have been no changes to exposure assumptions, toxicity data or RAOs that would call into question the ground water cleanup goals.

The vapor intrusion pathway has not been evaluated. This FYR conducted a screening-level vapor intrusion evaluation to assess the continued protectiveness of the remedy. EPA recently issued additional guidance recommending the use of multiple lines of evidence to evaluate the vapor intrusion pathway because this pathway is influenced by many variables, including the geology and hydrogeology of a site, building characteristics and seasonal changes. Information available for this FYR is limited to ground water sampling, sample location and depth.

Maximum contaminant concentrations detected in 2012 in the shallow aquifer system (SAS) were entered into the most recent EPA vapor intrusion screening level (VISL) calculator, integrating the most recent toxicity data. The VISL calculator provides conservative estimates of risk and noncancer hazards, because the predicted indoor air concentrations are empirically based using conservative "generic" attenuation factors. These factors reflect worst-case conditions and do not take into account any site-specific conditions such as site soil strata, depth to water table, and building properties that may reduce the transport of vapors from ground water through the soil column. The calculator was run to estimate indoor air risks using a ground water temperature of 25 degrees

Celsius for the State of Florida, obtained from the EPA's vapor intrusion guidance.[1] Monitoring data from shallow and intermediate ground water wells located near buildings in each OU were used to evaluate on-site worker exposure and hypothetical residential exposure.

The observed concentrations for both the shallow and intermediate zones were entered into the model for both residential and commercial land uses. Selected wells include those with the highest concentrations and those nearest to inhabited buildings. Because there is a hydraulic connection between the monitored shallow and intermediate zones and the depth to water in the two zones is similar (3-4 feet for the shallow and 5-10 feet for intermediate), this review conservatively includes the intermediate zone monitoring data in addition to the shallow well data.

The maximum concentrations in the shallow aquifer (with total depths approximately 15-20 feet bls) exceed the 2013 VISLs based on a 1E-06 cancer risk, but the calculated indoor air concentrations still fall within EPA's allowable carcinogenic risk of 1E-04 to 1E-06 and below the allowable non-carcinogenic hazard index of 1.0 for current commercial land use or for a hypothetical residential land use (Table 10). For the intermediate wells (with total depths approximately 40 feet bls), maximum detections in the intermediate aquifer also exceed 2013 VISLs. In addition, the calculated indoor air concentrations for TCE exceed EPA's maximum non-carcinogenic hazard index of 1.0 by approximately one order of magnitude. These calculations rely on data from OU2 well SC-19S, in which TCE concentrations have fluctuated in recent years as high as 1,300 µg/L (2007) and as low as 59 µg/L (2011).

The results indicate the concentrations in the shallow zone, which would have the greatest potential to infiltrate buildings, do not exceed EPA's acceptable risk levels for industrial land use. However, concentrations in the intermediate zone show the potential for unacceptable risk for current land use based on 2012 TCE concentrations in well SC-16S. In addition, the 2012 concentration in OU1 well GS-141S is the lowest in recent years and resulted in a hazard index of 1.0. If higher concentrations are detected in 2013, it would also be outside EPA acceptable risk.

The inclusion of the intermediate zones in the vapor intrusion assessment is a conservative approach and indicates further assessment is needed to ensure the vapor intrusion assessment is addressing the most contaminated ground water zone near occupied buildings. Further, current EPA vapor intrusion guidance recommends using wells that are screened across the top of the water table. However, well screen information was not available for this screening level analysis, thereby imparting additional uncertainty in the results. EPA and the PRPs will complete a full vapor intrusion assessment to more precisely determine any risks posed to workers at the Site. If necessary, institutional controls to restrict future residential land use will be implemented.

[1] User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings. The EPA's Office of Emergency and Remedial Response. February 2004 http://www.epa.gov/oswer/riskassessment/airmodel/pdf/2004_0222_3phase_users_guide.pdf.

Table 10: Vapor Intrusion Screening-Level Assessment

OU	COC	Maximum Ground Water Concentration in 2012	Calculated Indoor Air Concentration[a]	Vapor Intrusion Carcinogenic Risk	Vapor Intrusion Hazard
Shallow Wells (water table 3 to 4 feet bls)					
Residential Scenario					
OU2	TCE	0.86 µg/L (SC-TS14)	3.46E-01	8.0E-07	0.17
OU2	Vinyl chloride	3.2 µg/L (SC-TS14)	3.64E+00	2.3E-05	0.035
OU1	Vinyl chloride	11 µg/L (GS-M16)	1.25E+01	7.8E-05	0.12
Commercial Scenario					
OU2	TCE	0.86 µg/L (SC-TS14)	3.46E-01	1.2E-07	0.040
OU2	Vinyl chloride	3.2 µg/L (SC-TS14)	3.64E+00	1.3E-06	0.0083
OU1	Vinyl chloride	11 µg/L (GS-M16)	1.25E+01	4.5E-06	0.029
Intermediate Wells (water table 5 to 10 feet bls)					
Residential Scenario					
OU2	TCE	270 µg/L (SC-16S)	1.09E+02	**2.5E-04**	**52**
OU2	Vinyl chloride	120 µg/L (SC-19S)	1.36E+02	**8.5E-04**	**1.3**
OU1	TCE	22 µg/L (GS-141S)	8.86E+00	2.1E-05	**4.2**
OU1	Vinyl chloride	11 µg/L (GS-50S)	1.25E+01	7.8E-05	0.12
Commercial Scenario					
OU2	TCE	270 µg/L (SC-16S)	1.09E+02	3.6E-05	**12**
OU2	Vinyl chloride	120 µg/L (SC-19S)	1.36E+02	4.9E-05	0.31
OU1	TCE	22 µg/L (GS-141S)	8.86E+00	3.0E-06	1.0
OU1	Vinyl chloride	11 µg/L (GS-50S)	1.25E+01	4.5E-06	0.029

a. EPA Vapor Intrusion Screening Level Calculator, June 2013 (http://www.epa.gov/oswer/vaporintrusion/documents/VISL-Calculator.xlsm)

The ground water monitoring plan does not include analysis for the presence of 1,4-dioxane, a compound that is commonly used in industry as a stabilizer for chlorinated solvents such as PCE. EPA will determine if additional sampling is necessary to determine if 1,4-dioxane is present at the Site. Due to the institutional controls in place at the Site, the potential presence of 1,4-dioxane is not believed to affect human health and the environment.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The remedies for OU1 and OU2 are functioning as intended by the decision documents. The ground water plume is effectively contained and contaminant concentrations are declining. Consumption of contaminated ground water is prohibited under the Florida Ground Water Delineated Area designation. Public drinking water in the area is provided by a public utility and is pumped from upgradient areas not affected by the Site.

Natural attenuation appears to be working, but contaminant concentrations spike occasionally and the attenuation rate is slower than previously modeled. The PRPs believe that the observed contaminant spikes are the result of fluctuations in the microbial populations. However, the contaminant spikes could be due to residual source material in the vadose zone. The O&M plan is not up to date and does not include the MNA remedy. The PRPs will continue to monitor microbial populations and if needed, will work with EPA to identify and conduct additional strategic sampling to evaluate the possibility that additional source materials are present and to update the O&M plan.

ARARs have remained the same for all ground water COCs, except for 1,2-DCE, chromium and fluoride, which have become less stringent. The vapor intrusion pathway has not been evaluated. Based on the current ground water conditions, vapor intrusion does not pose an immediate threat to human health under a commercial land use setting. However, the potential for a completed pathway exists and based on a screening-level assessment could pose unacceptable risks under the current land use. The PRPs and EPA will further assess this pathway and determine if additional measures are needed to ensure protectiveness. No other information has come to light that could call into question the protectiveness of the remedy.

8.0 Issues

Table 11 summarizes the current site issue.

Table 11: Current Site Issue

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
A site-specific vapor intrusion assessment has never been conducted.	No	Yes

9.0 Recommendations and Follow-up Actions

Table 12 provides a recommendation to address the current site issue.

Table 12: Recommendation to Address Current Site Issue

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
A site-specific vapor intrusion assessment has never been conducted.	Conduct a site-specific vapor intrusion assessment in accordance with the most recent EPA vapor intrusion guidance.	PRP	EPA	02/03/2015	No	Yes

The following additional items, though not expected to affect protectiveness, warrant additional follow-up:

- EPA recommends the PRPs update the projected time to completion and update the O&M plan to include the MNA remedy and current sampling plan.
- EPA recommends the PRPs work with EPA to conduct additional sampling and further evaluate the cause of contaminant increases.

10.0 Protectiveness Statements

The remedy for OU1 currently protects human health and the environment in the short term because no human exposure pathways to contaminated ground water currently exist. However, in order for the remedy to be protective in the long term, the potential risk from vapor intrusion needs to be further assessed.

The remedy for OU2 currently protects human health and the environment in the short term because no human exposure pathways to contaminated ground water currently exist. However, in order for the remedy to be protective in the long term, the potential risk from vapor intrusion needs to be further assessed.

Because the remedial actions at all OUs are short-term protective due to no human exposure pathways to contaminated ground water, the remedy is short-term protective. In order for the Site to be protective in the long term, the potential risk from vapor intrusion needs to be further assessed.

11.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System (CERCLIS) Site Information accessed from website http://cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400460 March-August 2008.

Consent Agreement. (OGC File No.:89-0496) State of Florida, Department of Environmental Regulation, Complainant vs. Harris Corporation, a Delaware Corporation, Respondent. March 15, 1990.

Consent Decree. U.S. vs. Harris Corporation. Civil Action No.:91-624-CIV-ORL-19. March 8, 1991.

EPA Record of Decision: Harris Corp. (Palm Bay Plant) EPA ID: FLD000602334. OU 01 Palm Bay, FL. June 28, 1990.

EPA Record of Decision: Harris Corp. (Palm Bay Plant) EPA ID: FLD000602334. OU 02 Palm Bay, FL. February 15, 1995.

Explanation of Significant Differences Fact Sheet. Harris Corporation/Palm Bay Facility Site. OU1. October 1992.

Explanation of Significant Differences Fact Sheet. Harris Corporation/Palm Bay Facility Superfund Site. OU2. November 1995.

Explanation of Significant Differences Fact Sheet. Harris Corporation/Palm Bay Facility Superfund Site. OU1 and OU2. November 2009.

First Amendment to Consent Agreement. (OGC File No.:89-0496) In State of Florida Department of Environmental Regulation, Complainant, Vs. Harris Corporation, a Delaware Corporation, Respondent. October 8, 1991.

First Five-Year Review Report for Harris Corp. (Palm Bay Plant) Superfund Site. City of Palm Bay, Brevard County, Florida. February 3, 2004.

Second Five-Year Review Report for Harris Corp. (Palm Bay Plant) Superfund Site. City of Palm Bay, Brevard County, Florida. February 3, 2009.

L.S. Sims & Associate, Inc. 2008 Annual Systems Performance Review, Operable Units 1 & 2, Harris Corporation, Palm Bay, Florida. March 2004.

L.S. Sims & Associate, Inc. 2009 Annual Systems Performance Review, Operable Units 1 & 2, Harris Corporation, Palm Bay, Florida. February 2005.

L.S. Sims & Associate, Inc. 2010 Annual Systems Performance Review, Operable Units 1 & 2, Harris Corporation, Palm Bay, Florida. February 2006.

L.S. Sims & Associate, Inc. 2011 Annual Systems Performance Review, Operable Units 1 & 2, Harris Corporation, Palm Bay, Florida. March 2007.

L.S. Sims & Associate, Inc. 2007 Annual Systems Performance Review, Operable Units 1 & 2, Harris Corporation, Palm Bay, Florida. February 2008.

Appendix B: Press Notice

The U.S. Environmental Protection Agency, Region 4
Announces the Third Five-Year Review for
the Harris Corporation (Palm Bay Facility) Superfund Site,
Palm Bay, Brevard County, Florida

Purpose/Objective: The EPA is conducting a five-year review of the remedy for the Harris Corporation (Palm Bay Facility) Superfund site (the Site) in Palm Bay, Florida. The purpose of the five-year review is to make sure the selected cleanup actions effectively protect human health and the environment.

Site Background: The Site occupies about 310 acres in Palm Bay, Florida. Radiation Corporation, an electronics firm supporting the aerospace industry, operated at the Site in the 1950s and 1960s. Harris Corporation purchased the company and has manufactured electronic parts, communications and information processing equipment on site since 1967. Two separate manufacturing firms previously used part of the site property for painting operations, chromium plating, a machine shop and a drum storage area. In the early 1980s, the EPA identified plumes of contaminated ground water beneath the Harris Corporation facility and an adjacent well field owned by Palm Bay Utilities Corporation. Contaminants included vinyl chloride, tetrachloroethylene, trichloroethylene, benzene and chromium. The EPA determined that concentrations of some of these contaminants in ground water could cause unacceptable human health risks. The EPA added the Site to the Superfund program's National Priorities List on July 22, 1987.

Cleanup Actions: The EPA designated two operable units (OUs) to address the Site's contamination. The EPA signed the Records of Decision selecting the remedies for OU1 and OU2 in June 1990 and February 1995, respectively. The remedies include institutional controls to prohibit ground water consumption, two separate ground water extraction and treatment systems, and continued monitoring of contaminant concentrations. Remedy construction for OU1 finished in July 1996 and remedy construction for OU2 finished in July 1998. Based on decreased contaminant concentrations in monitoring wells, the EPA approved the deactivation of the OU2 ground water treatment system on June 5, 2000, and the deactivation of the OU1 ground water treatment system as of October 2002. The treatment systems remain in standby mode. Sampling of ground water to monitor the long-term effectiveness of natural attenuation of remaining contamination is ongoing.

Five-Year Review Schedule: The National Contingency Plan requires review of remedial actions that result in any hazardous substances, pollutants or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human health and the environment. The third of the five-year reviews for the Site will be completed by February 2014.

EPA Invites Community Participation in the Five-Year Review Process: The EPA is conducting this five-year review to evaluate the effectiveness of the Site's remedy and to make sure the remedy remains protective of human health and the environment. As part of the five-year review process, EPA staff members are available to answer any questions about the Site. Community members who have questions about the Site or the five-year review process, or who would like to participate in a community interview, are asked to contact:

Michael Taylor, EPA Remedial Project Manager
Phone: (404) 562-8762
Email: taylor.michael@epa.gov

L'Tonya Spencer, EPA Community Involvement Coordinator
Phone: (404) 562-8463 | (877) 718-3752 (toll-free)
Email: spencer.latonya@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, GA 30303-8960

Additional site information is available at the Site's local document repository, located at Franklin Degroodt Memorial Library, 6475 Minton Road, Palm Bay, Florida 32909, and online at: *http://epa.gov/region4/superfund/sites/npl/florida/harriscpfl.html*.

Appendix C: Interview Forms

Harris Corp. (Palm Bay Plant) Superfund Site **Five-Year Review Interview Form**

Site Name: Harris Corp. (Palm Bay Plant) **EPA ID No.:** FLD000602334
Interviewer Name: Johnny Zimmerman-Ward **Affiliation:** Skeo Solutions
Subject Name: Michael Taylor **Affiliation:** EPA

Subject Contact Information: USEPA Region 4 61 Forsyth Street Atlanta, GA 30303 (404) 562-8762

Time: 11:00am **Date:** 08/26/2013
Interview Location: SNAFC Atlanta, GA

Interview Format (circle one): In Person Phone Mail Other: EMAIL

Interview Category: EPA RPM

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   The project is proceeding as anticipated. The ground water is in a monitored natural attenuation phase and target goals have not been met but progress is indicating a downward trend for contaminants of concern. The reuse/redevelopment of the Intersil property has been positive. The Florida Institute of Technology is in the process of purchasing five acres with building facilities for their campus use. The Harris Corp facility is constructing a large multi-story complex on their property to consolidate leased offices from off property.

2. What have been the effects of this Site on the surrounding community, if any?
   The immediate effects to the surrounding community have been minimal. The facility owns approximately 300 acres and this allows for very little impact to anyone nearby. The impact to ground water is contained within the property and not directly affecting any nearby business or resident. The community has been informed of the site activities over time and EPA has not received any negative feedback since I have been involved with the project. The facility provides a substantial number of jobs and contributes a great deal to the community. This facility is one of the largest employers in the area.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities since the implementation of the cleanup?
   I am not aware of any complaints related to this site since my involvement in 2008. I am aware of two inquiries related to the reuse/redevelopment of the Intersil property by the University of Central Florida and the Florida Institute of Technology.

4. What is your assessment of the current performance of the remedy in place at the Site?

The remediation phase is in a long term remedial action (LTRA). Currently, monitored natural attenuation (MNA) is underway. Final cleanup of these contaminants of concern can take some time to remediate. The site performance is proceeding as expected.

5. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?
   The Second Five Year Review addressed the ICs and the issuance of the ESD in 2009 memorialized this issue with the delineated area.

6. Are you aware of any community concerns regarding the Site or the operation and management of its remedy? If so, please provide details.
   I am not aware of any community concerns at this time related to the site remedial action.

7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
   Site progress and evaluation of the site along with discussions with the facility contractor will explore other options to enhance the cleanup effort. The remedy is currently for MNA and remediation is progressing as anticipated.

Site Name:	**Harris Corp. (Palm Bay Plant)**	**EPA ID No.:**	**FLD000602334**
Interviewer Name:	**Johnny Zimmerman-Ward**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Steven Browne**	**Affiliation:**	**Intersil**
Subject Contact Information:	**321-724-7605**		
Time:	**1:35 PM**	**Date:**	**08/13/2013**
Interview Location:	**Harris Corp.**		

Interview Format (circle one): **In Person** **Phone** **Mail** **Other:**

Interview Category: **Potentially Responsible Parties (PRPs)**

1. What is your overall impression of the remedial activities at the Site?
   As long as we are abiding by the rules, I have a good overall impression of the remedial activities. I am assured that the cleanup has been done properly.

2. What have been the effects of this Site on the surrounding community, if any?
   None, we are not allowed to disrupt the buildings.

3. What is your assessment of the current performance of the remedy in place at the Site?
   I have been impressed by the current performance, it is adequate.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?
   No, we have received none.

5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?
   Yes, I see the annual reports.

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
   No. We are trying to donate Building 54 to FIT. Originally it was occupied by UFC for a thermal panel project.

Site Name:	**Harris Corp. (Palm Bay Plant)**	**EPA ID No.:**	**FLD000602334**
Interviewer Name:	**Johnny Zimmerman-Ward**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Costa Triantafyllidis**	**Affiliation:**	**Harris Corporation**
Subject Contact Information:	**321-729-3928**		
Time:	**1:40 PM**	**Date:**	**08/13/2013**
Interview Location:	**Harris Corp.**		

Interview Format (circle one): **In Person** **Phone** **Mail** **Other:**

Interview Category: **Potentially Responsible Parties (PRPs)**

1. What is your overall impression of the remedial activities at the Site?
   Remediation has been effective through MNA. The data indicate COCs are decreasing. The remedy at the site is protective of human health and the environment.

2. What have been the effects of this Site on the surrounding community, if any?
   There has been no impact because we do not provide potable water.

3. What is your assessment of the current performance of the remedy in place at the Site?
   It is effectively remediating ground water through MNA.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?
   No, we have received none.

5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?
   Yes.

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
   No.

Site Name:	**Harris Corp. (Palm Bay Plant)**	**EPA ID No.:**	**FLD000602334**
Interviewer Name:	**Ryan Burdge**	**Affiliation:**	**Skeo Solutions**
Subject Name:	**Larry Sims**	**Affiliation:**	**L.S. Sims and Associates**
Time:	**1:40**	**Date:**	**8/13/2013**
Interview Location:	**Harris Corp.**		

Interview Format (circle one): **In Person** **Phone** **Mail** **Other:**

Interview Category: **O&M Contractor**

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   Overall, the cleanup is on track. The site conditions support the degradation of remaining contaminants. The treatment systems are deteriorating and should be removed for safety reasons. The extraction wells and piping could be retained, as needed. We are happy with the new construction at the Harris plant.

2. What is your assessment of the current performance of the remedy in place at the Site?
   The original area of contamination has decreased significantly. It is not getting worse and there is no migration. The deep plume of vinyl chloride in the southern end has low concentrations, but it may be difficult to achieve cleanup goals through natural attenuation. The OU2 plume is not migrating, but is not degrading quickly. We will continue to model the site to assess remedy performance.

3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site?
   Overall, concentrations are decreasing but have also shown cyclical trends, due to the increase and declines in microbial populations.

4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence.
   There is not much to maintain. The Harris staff checks the locks twice per year. We conduct annual sampling and inspections.

5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.
   We followed the recommendations from the previous five-year review and now monitor microbial populations. We occasionally add new or different wells either out of necessity or to assess different areas.

6. Have there been unexpected O&M difficulties or costs at the Site since start-up or in the last five years? If so, please provide details.
   The newly constructed building at Harris Corp. required five wells to be plugged. Two new wells were installed and are now part of the monitoring program.

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies.
   There is not much to optimize. We use low-flow sampling methods to minimize purge time and we have omitted clean wells from the sampling program.

8. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?
   No.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST	
I. SITE INFORMATION	
Site Name: Harris Corp. (Palm Bay Plant)	**Date of Inspection: 08/03/2013**
Location and Region: Palm Bay, FL Region 4	**EPA ID: FLD000602334**
Agency, Office or Company Leading the Five-Year Review: EPA Region 4	**Weather/Temperature: Sunny and 90s**
Remedy Includes: (Check all that apply) ☐ Landfill cover/containment ☐ Access controls ☐ Institutional controls ☐ Ground water pump and treatment ☐ Surface water collection and treatment ☐ Other: ____	☒ Monitored natural attenuation ☐ Ground water containment ☐ Vertical barrier walls
Attachments: ☐ Inspection team roster attached ☐ Site map attached	
II. INTERVIEWS (check all that apply)	
1. **O&M site manager** Larry Sims (Name) / Project Manager (Title) / 08/03/2013 (Date) Interviewed ☒ at site ☐ at office ☐ by phone Phone no. 321-504-4046 Problems, suggestions; ☒ Report attached see Appendix C	
2. **O&M Staff** ____ (Name) / ____ (Title) / mm/dd/yyyy (Date) Interviewed ☐ at site ☐ at office ☐ by phone Phone: ____ Problems/suggestions ☐ Report attached: ____	

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

Agency _____
Contact | _____ Name | _____ Title | _____ Date | _____ Phone No.
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact | _____Name | _____ Title | _____ Date | _____ Phone No.
Problems/suggestions ☐ Report attached:_____

Agency _____
Contact | _____ Name | _____ Title | _____ Date | _____ Phone No.
Problems/suggestions ☐ Report attached:_____

Agency _____
Contact | _____ Name | _____ Title | _____ Date | _____ Phone No.
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact | _____ Name | _____ Title | _____ Date | _____ Phone No.
Problems/suggestions ☐ Report attached:_____

4. **Other Interviews** (optional) ☐ Report attached: _____

Steven Browne, Intersil

Costa Triantafyllidis, Harris Corp.

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☐ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A
☒ Maintenance logs	☒ Readily available	☐ Up to date	☐ N/A

Remarks: Since system put on standby, no current maintenance or maintenance logs. O&M plan is for the ground water remediation system, but there is no O&M plan for the MNA remedy.

2.	**Site-Specific Health and Safety Plan**	☒ Readily available	☒ Up to date	☐ N/A
	☒ Contingency plan/emergency response plan	☒ Readily available	☒ Up to date	☐ N/A

Remarks: _____

3.	**O&M and OSHA Training Records**	☒ Readily available	☒ Up to date	☐ N/A

Remarks: _____

4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
7.	**Ground Water Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A
	Remarks: _____			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: _____			

IV. O&M COSTS

1.	**O&M Organization**	
	☐ State in-house	☐ Contractor for state
	☐ PRP in-house	☒ Contractor for PRP
	☐ Federal facility in-house	☐ Contractor for Federal facility
	☐ _____	

2. **O&M Cost Records**

☒ Readily available ☒ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate: $96,000 ☐ Breakdown attached

Total annual cost by year for review period if available

From: 01/01/2008 Date	To: 12/31/2008 Date	$78,000 Total cost	☐ Breakdown attached
From: 01/01/2009 Date	To: 12/31/2009 Date	$63,000 Total cost	☐ Breakdown attached
From: 01/01/2010 Date	To: 12/31/2010 Date	$54,000 Total cost	☐ Breakdown attached
From: 01/01/2011 Date	To: 12/31/2011 Date	$53,000\ Total cost	☐ Breakdown attached
From: 01/01/2012 Date	To: 12/31/2012 Date	$37,000 Total cost	☐ Breakdown attached
From: 01/01/2013 Date	To: 06/30/2008 Date	$25,000 Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: _____

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: Facility is secure. Escort and signing in is required to visit the facility.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): None

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ mm/dd/yyyy _____

Name Title Date Phone no.

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: Site lies within a Florida Ground Water Delineated Area.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☐ N/A

Remarks: Harris Corporation is constructing a new building on site. Wells were abandoned and new ones installed due to footprint of building.

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: The pump-and- treat system would require a moderate amount of effort to return to use if necessary, due to years of inactivity. The PRPs would prefer to use a new system if the need arose.

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☐ Settlement not evident

Arial extent: _____ Depth: _____

Remarks: _____

2.	**Cracks**	☐ Location shown on site map	☐ Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☐ Bulges not evident
	Arial extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent: _____
	☐ Ponding	☐ Location shown on site map	Arial extent: _____
	☐ Seeps	☐ Location shown on site map	Arial extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☐ No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☐ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		

3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
C. Letdown Channels		☐ Applicable	☐ N/A
	(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** (Low spots)	☐ Location shown on site map	☐ No evidence of settlement
	Arial extent: _____		Depth: _____
	Remarks: _____		
2.	**Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
	Material type:_____		Arial extent: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ No evidence of erosion
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Undercutting**	☐ Location shown on site map	☐ No evidence of undercutting
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Obstructions**	Type: _____	☐ No obstructions
	☐ Location shown on site map	Arial extent: _____	
	Size: _____		
	Remarks: _____		
6.	**Excessive Vegetative Growth**	Type: _____	
	☐ No evidence of excessive growth		
	☐ Vegetation in channels does not obstruct flow		
	☐ Location shown on site map	Arial extent: _____	
	Remarks: _____		
D. Cover Penetrations		☐ Applicable	☐ N/A
1.	**Gas Vents**	☐ Active	☐ Passive
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled ☐ Good condition
	☐ Evidence of leakage at penetration	☐ Needs maintenance	☐ N/A
	Remarks: _____		

2. **Gas Monitoring Probes**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2.	**Erosion**	Area extent: _____	Depth: _____
	☐ Erosion not evident		
	Remarks: _____		
3.	**Outlet Works**	☐ Functioning	☐ N/A
	Remarks: _____		
4.	**Dam**	☐ Functioning	☐ N/A
	Remarks: _____		
H. Retaining Walls		☐ Applicable	☐ N/A
1.	**Deformations**	☐ Location shown on site map	☐ Deformation not evident
	Horizontal displacement: _____		Vertical displacement: _____
	Rotational displacement: _____		
	Remarks: _____		
2.	**Degradation**	☐ Location shown on site map	☐ Degradation not evident
	Remarks: _____		
I. Perimeter Ditches/Off-Site Discharge		☐ Applicable	☐ N/A
1.	**Siltation**	☐ Location shown on site map	☐ Siltation not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
2.	**Vegetative Growth**	☐ Location shown on site map	☐ N/A
	☐ Vegetation does not impede flow		
	Area extent: _____		Type: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Discharge Structure**	☐ Functioning	☐ N/A
	Remarks: _____		
VIII. VERTICAL BARRIER WALLS		☐ Applicable	☒ N/A
1.	**Settlement**	☐ Location shown on site map	☐ Settlement not evident
	Area extent: _____		Depth: _____
	Remarks: _____		

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUND WATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Ground Water Extraction Wells, Pumps and Pipelines ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☐ Good condition ☒ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☒ Needs maintenance

Remarks: Pump-and-treat stations were put on standby, but would require work to restart if necessary.

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: Pump-and-treat stations were put on standby, but would require work to restart if necessary.

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☒ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of ground water treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: The air stripper at the PBU property is in good working order. The OU1 and OU2 pump-and-treat systems would require a moderate amount of effort to return to use if necessary, due to years of inactivity.

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☒ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☒ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☒ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☒ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: Monitoring wells have been abandoned during construction of new facilities at Harris Corporation. Some wells have been replaced with new wells.

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2.	**Monitoring Data Suggests:**
	☒ Ground water plume is effectively contained ☒ Contaminant concentrations are declining
E. Monitored Natural Attenuation	
1.	**Monitoring Wells** (natural attenuation remedy)
	☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
	☐ All required wells located ☐ Needs maintenance ☐ N/A
	Remarks: Monitoring wells have been abandoned during construction of new facilities at Harris Corporation. Some wells have been replaced with new wells.
X. OTHER REMEDIES	
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
XI. OVERALL OBSERVATIONS	
A.	**Implementation of the Remedy**
	Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). The remedy was originally designed in the ROD to clean up the ground water contamination by pump-and-treat. ESDs changed the cleanup to monitored natural attenuation. The pump-and-treat systems on site were to be on standby mode, as indicated in the 2004 FYR.
B.	**Adequacy of O&M**
	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. Ground water monitoring occurs consistently and reports are generated yearly. The Site is well-maintained by the PRPs.
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. The pump-and-treat systems that were placed on standby are no longer functional. They would require work or replacement if it were necessary to bring them back online.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. The PRP's contractor should research possible enhancements to monitored natural attenuation to speed up the cleanup process.

Appendix E: Photographs from Site Inspection

OU1 monitoring wells

Offline OU1 air stripper

Offline OU2 air stripper

No trespassing and real estate signage

Signage for under-construction building at Harris Corp

Under-construction building at Harris Corp

South-facing view from OU1 air stripper to PBU facility

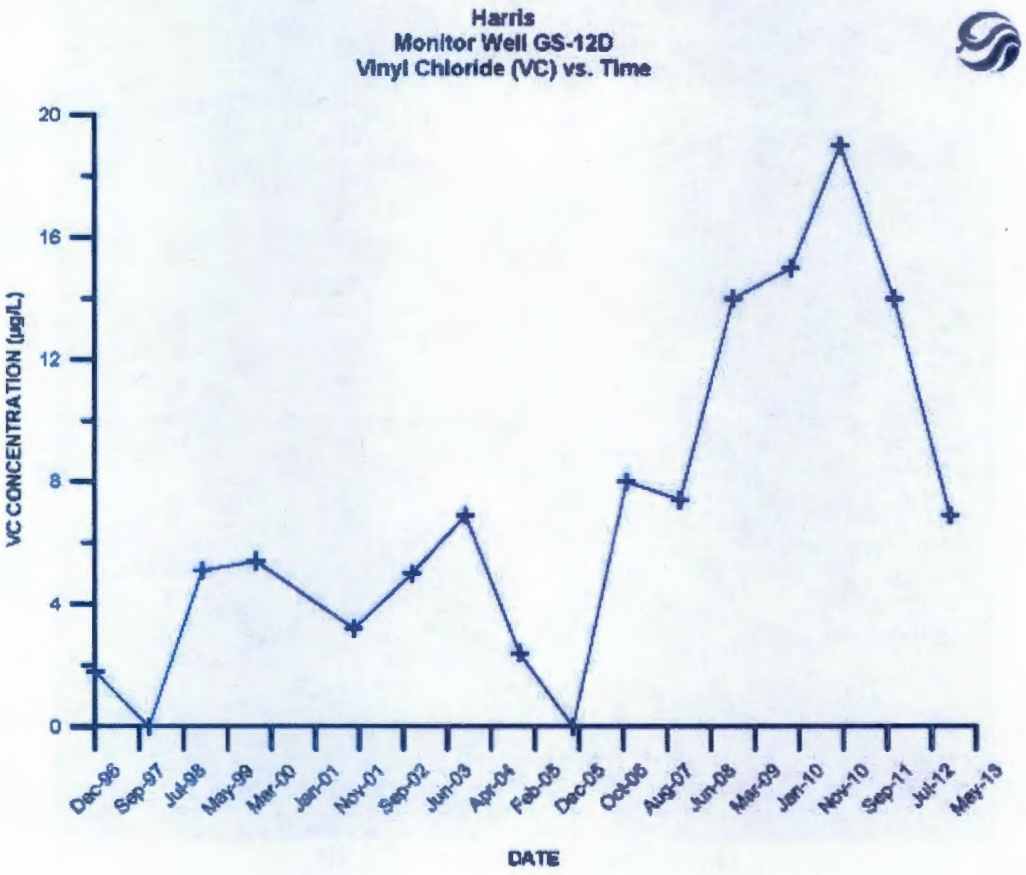
North-facing view of Harris Corp from OU1 air stripper

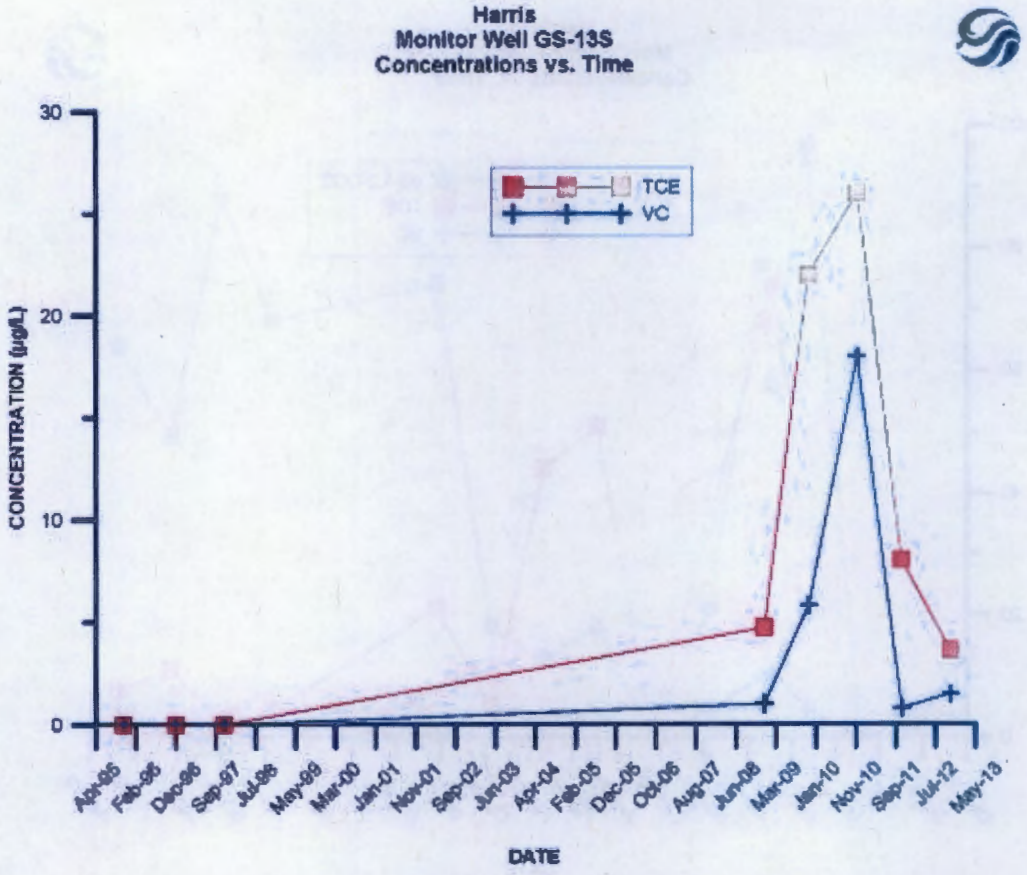
Signage at OU1 air stripper

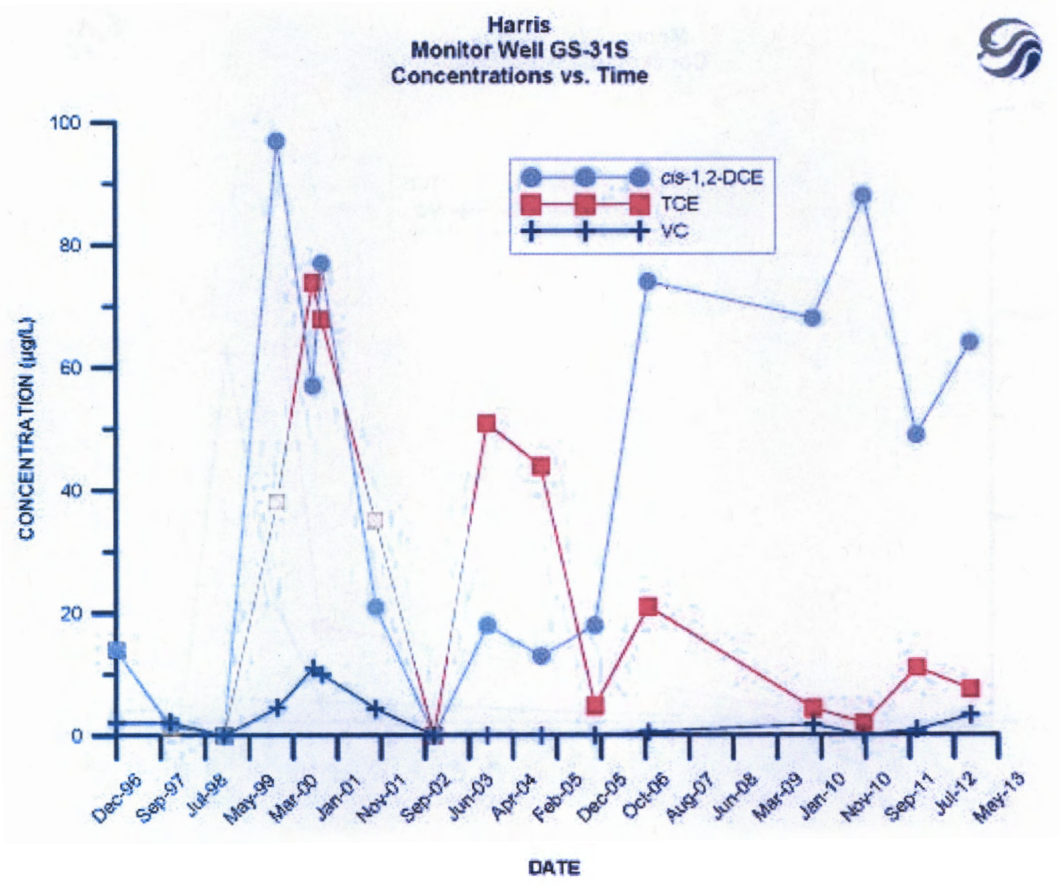
Lake at Intersil property, OU2

Harris Palm Bay Well GS-50 SR

Appendix F: Historic Ground Water Contamination Charts




Harris
Monitor Well GS-13S
Concentrations vs. Time
TCE
VC
CONCENTRATION (µg/L)
30
20
10
0
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
Mar-09
Jan-10
Nov-10
Sep-11
Jul-12
May-13
DATE


Harris
Monitor Well GS-31S
Concentrations vs. Time
cis-1,2-DCE
TCE
VC
CONCENTRATION (µg/L)
100
80
60
40
20
0
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
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Nov-10
Sep-11
Jul-12
May-13
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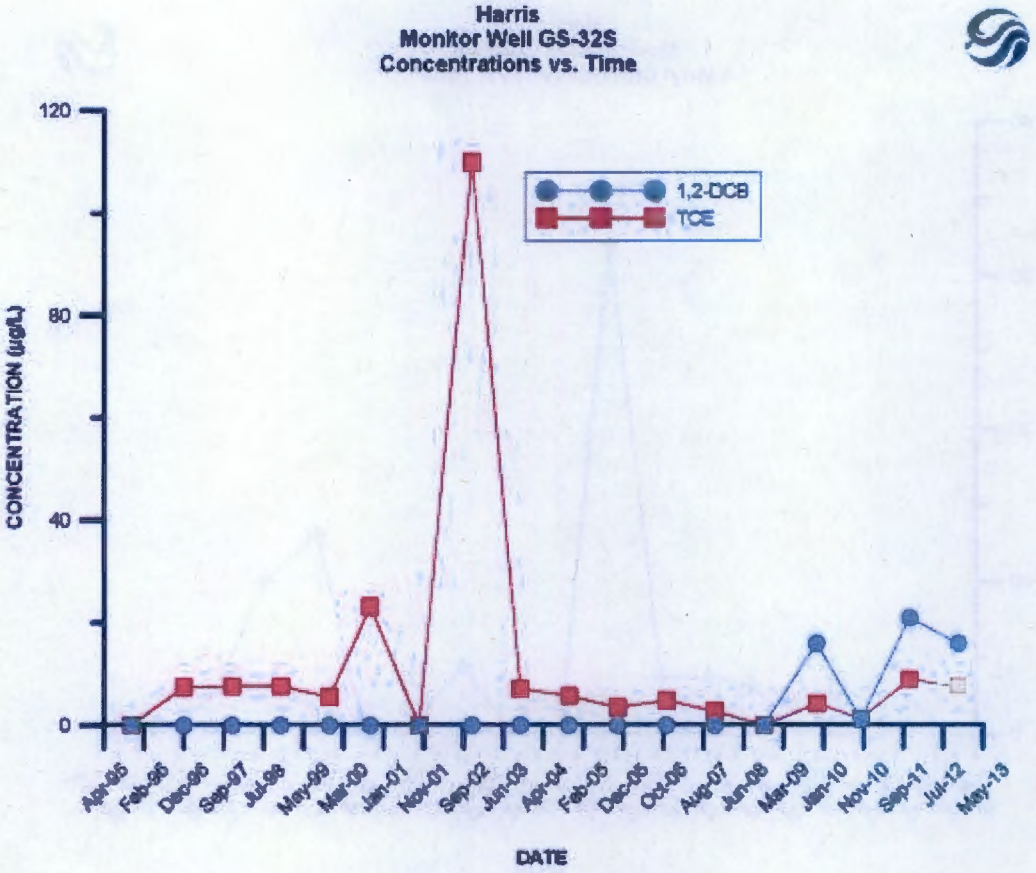
Harris
Monitor Well GS-32S
Concentrations vs. Time
120
80
40
0
CONCENTRATION (µg/L)
1,2-DCB
TCE
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
Mar-09
Jan-10
Nov-10
Sep-11
Jul-12
May-13
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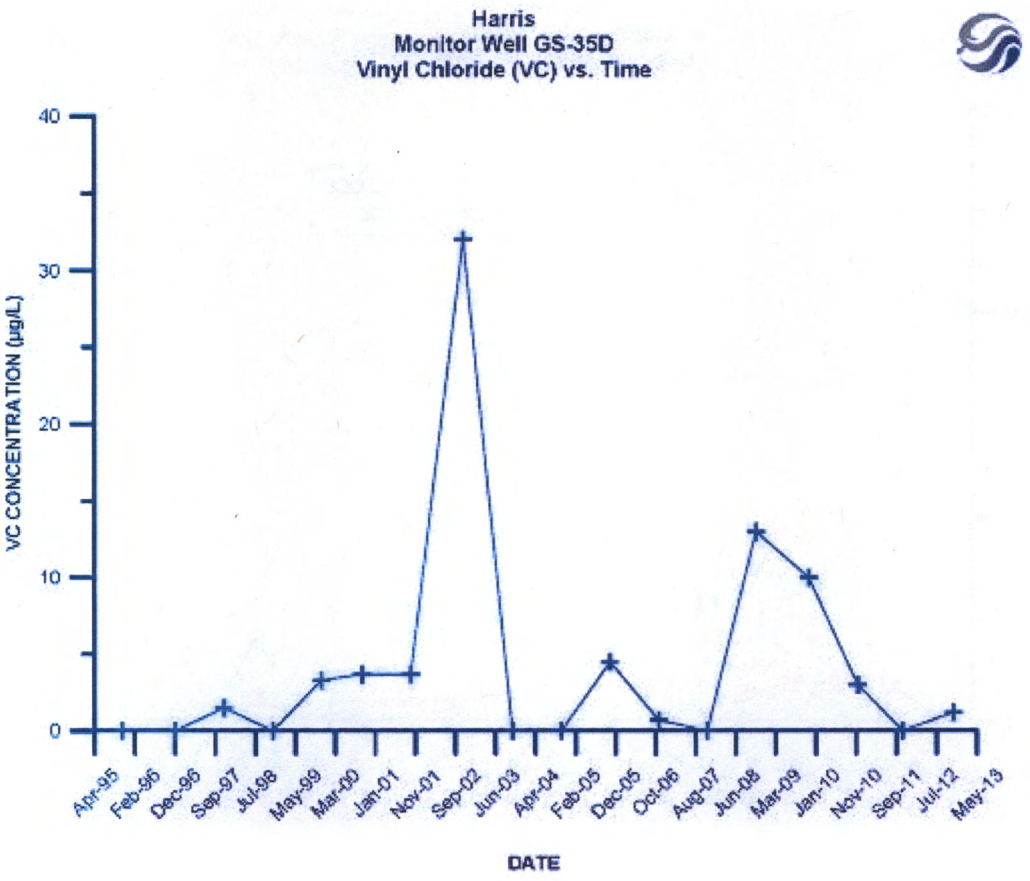
Harris
Monitor Well GS-35D
Vinyl Chloride (VC) vs. Time
VC CONCENTRATION (µg/L)
40
30
20
10
0
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
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Jan-10
Nov-10
Sep-11
Jul-12
May-13
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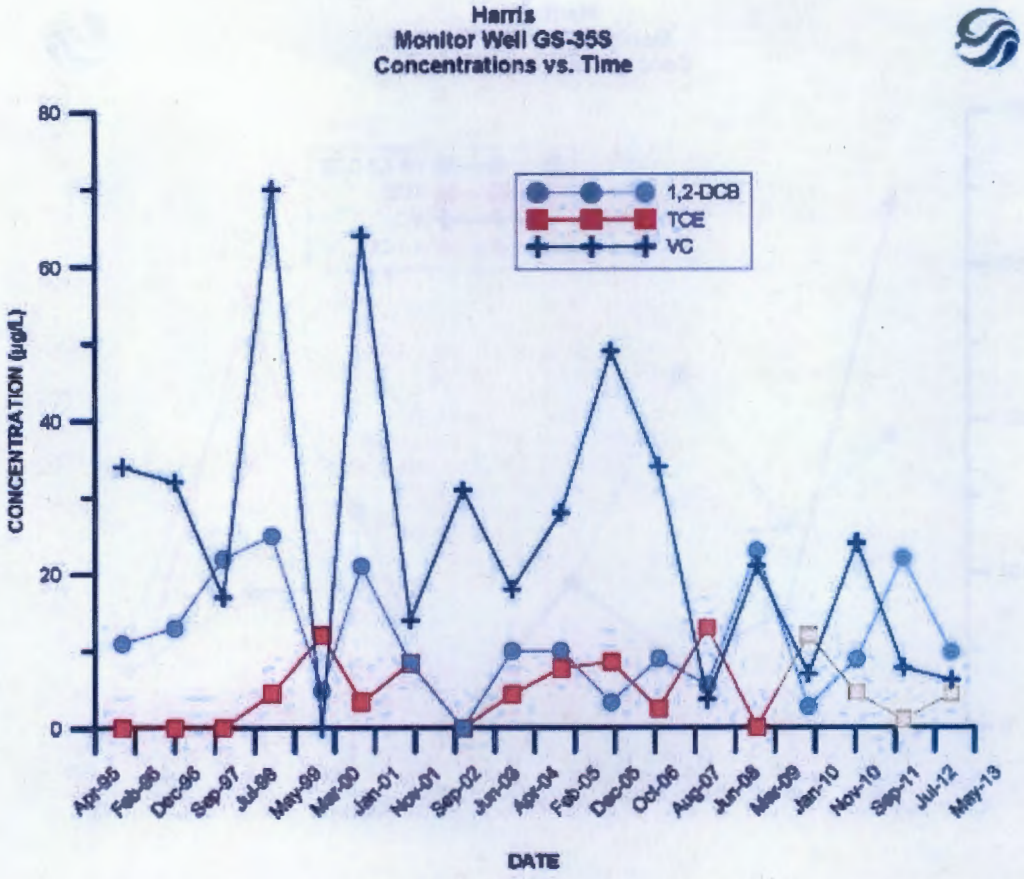
Harris
Monitor Well GS-35S
Concentrations vs. Time
1,2-DCB
TCE
VC
CONCENTRATION (µg/L)
0
20
40
60
80
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
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Sep-11
Jul-12
May-13
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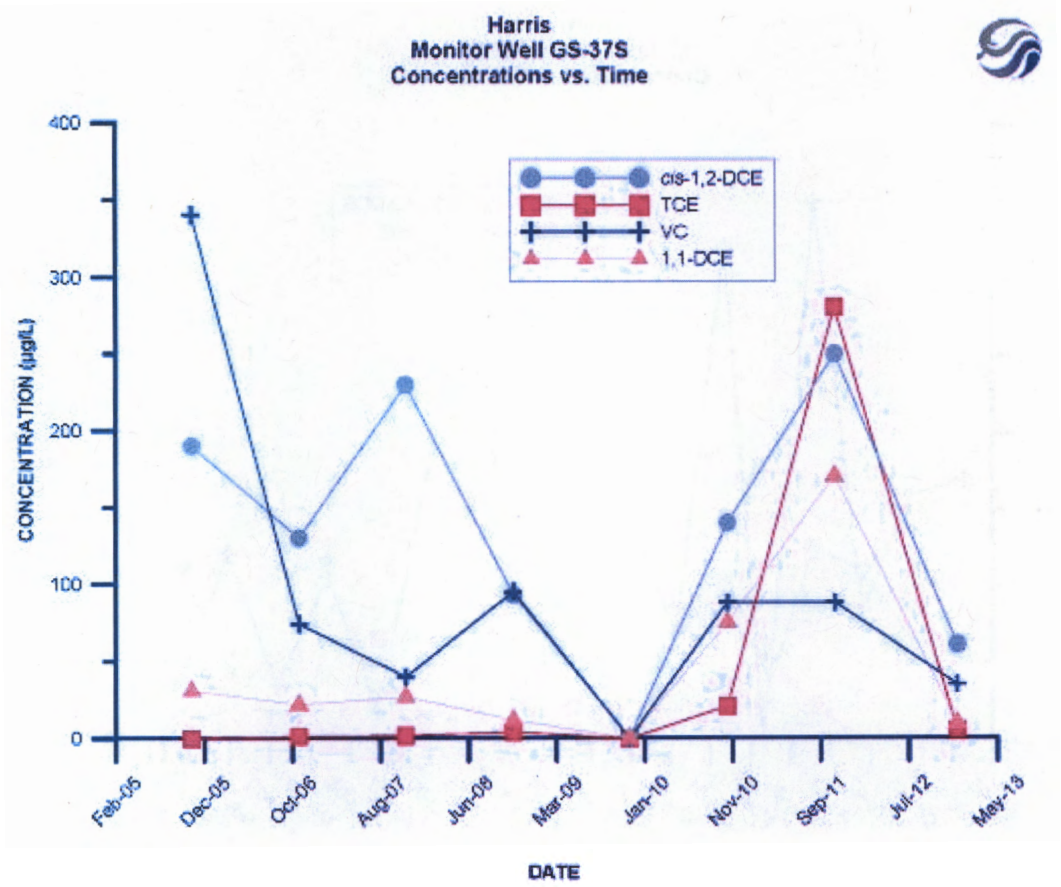
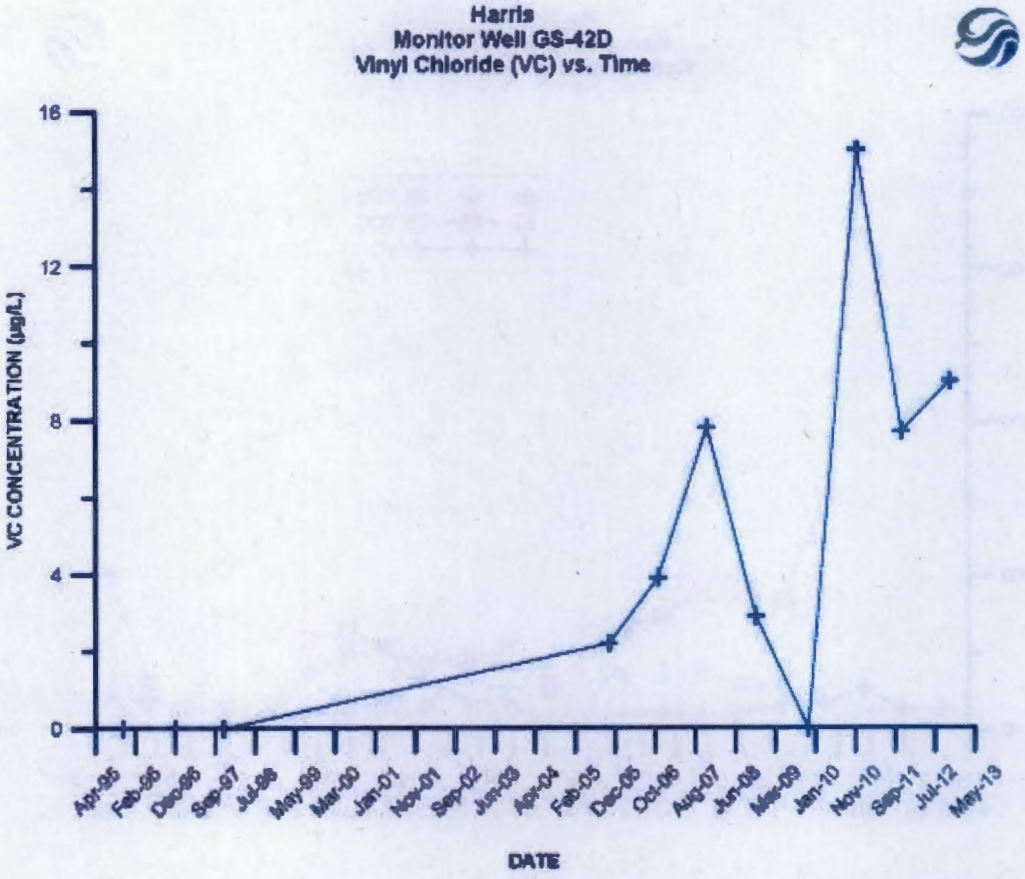

Harris
Monitor Well GS-37S
Concentrations vs. Time
cis-1,2-DCE
TCE
VC
1,1-DCE
CONCENTRATION (µg/L)
400
300
200
100
0
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
Mar-09
Jan-10
Nov-10
Sep-11
Jul-12
May-13
DATE


Harris
Monitor Well GS-42D
Vinyl Chloride (VC) vs. Time
VC CONCENTRATION (µg/L)
16
12
8
4
0
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
Mar-09
Jan-10
Nov-10
Sep-11
Jul-12
May-13
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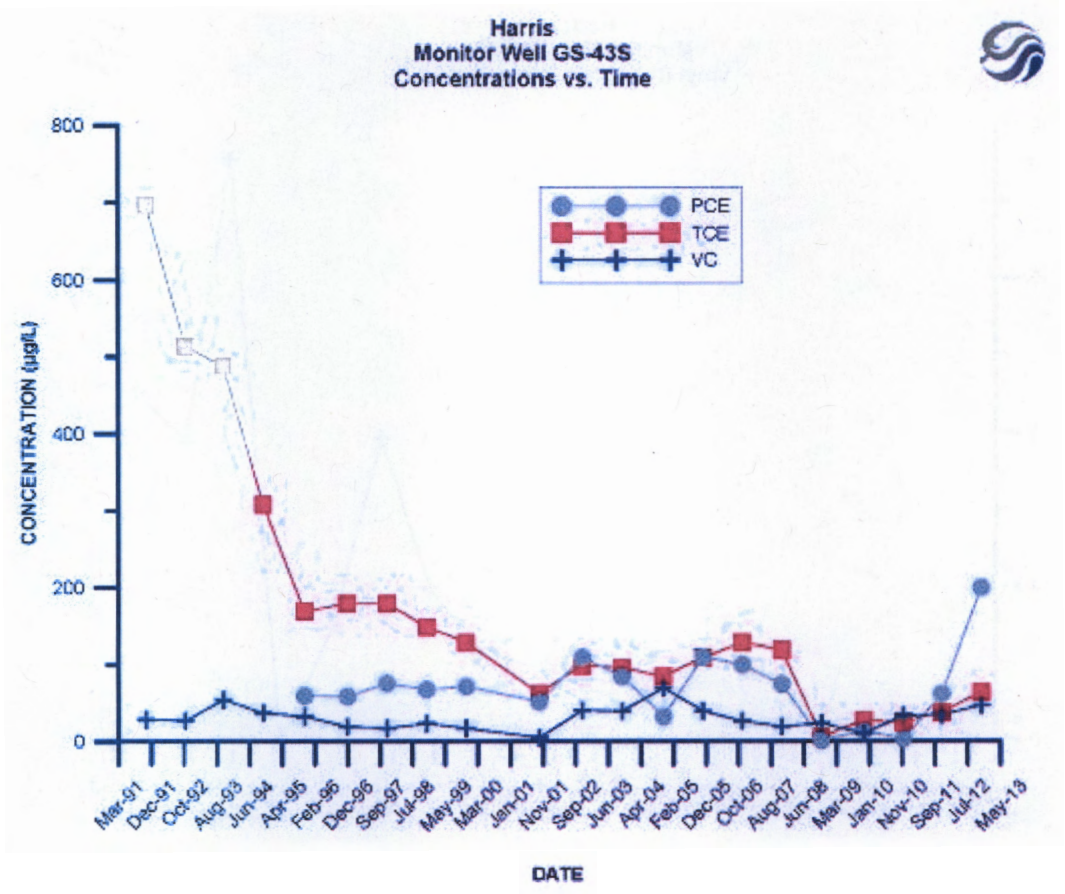
Harris
Monitor Well GS-43S
Concentrations vs. Time
PCE
TCE
VC
CONCENTRATION (µg/L)
800
600
400
200
0
Mar-91
Dec-91
Oct-92
Aug-93
Jun-94
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
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Nov-10
Sep-11
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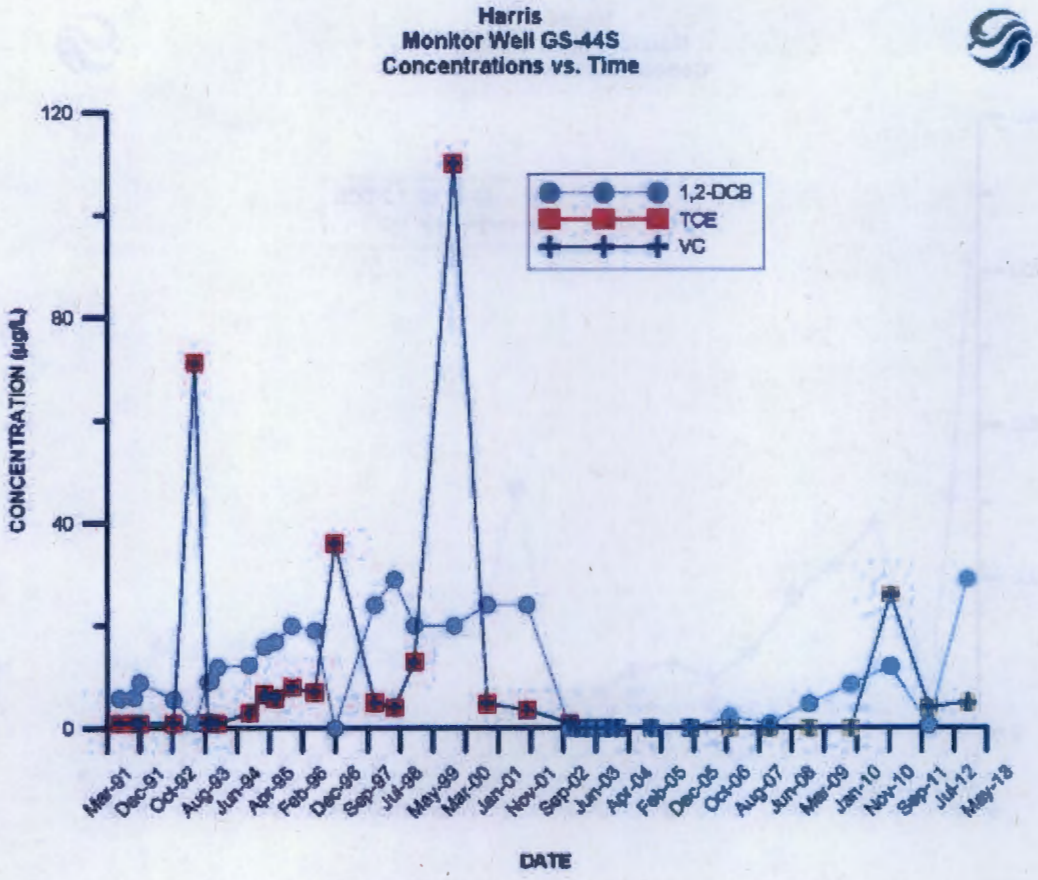
Harris
Monitor Well GS-44S
Concentrations vs. Time
1,2-DCB
TCE
VC
CONCENTRATION (ug/L)
120
80
40
0
Mar-91
Dec-91
Oct-92
Aug-93
Jun-94
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
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May-13
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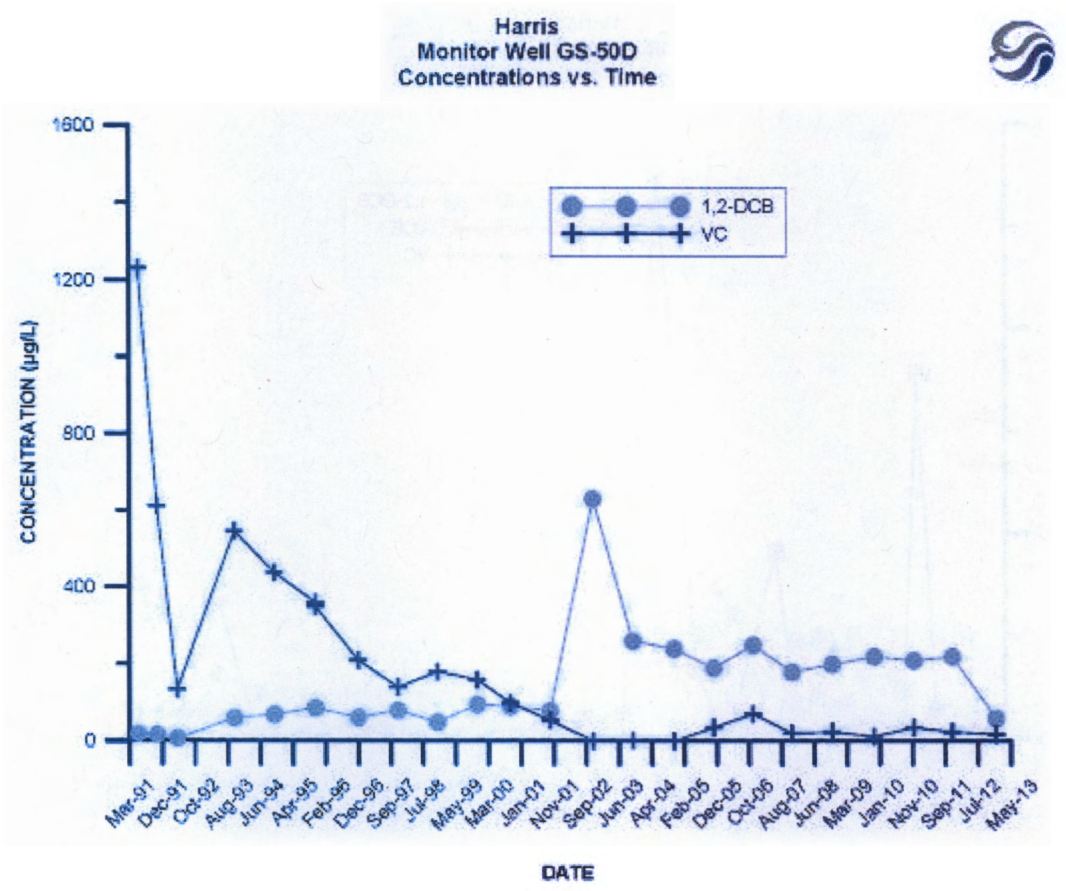
Harris
Monitor Well GS-50D
Concentrations vs. Time
1,2-DCB
VC
CONCENTRATION (µg/L)
1600
1200
800
400
0
Mar-91
Dec-91
Oct-92
Aug-93
Jun-94
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
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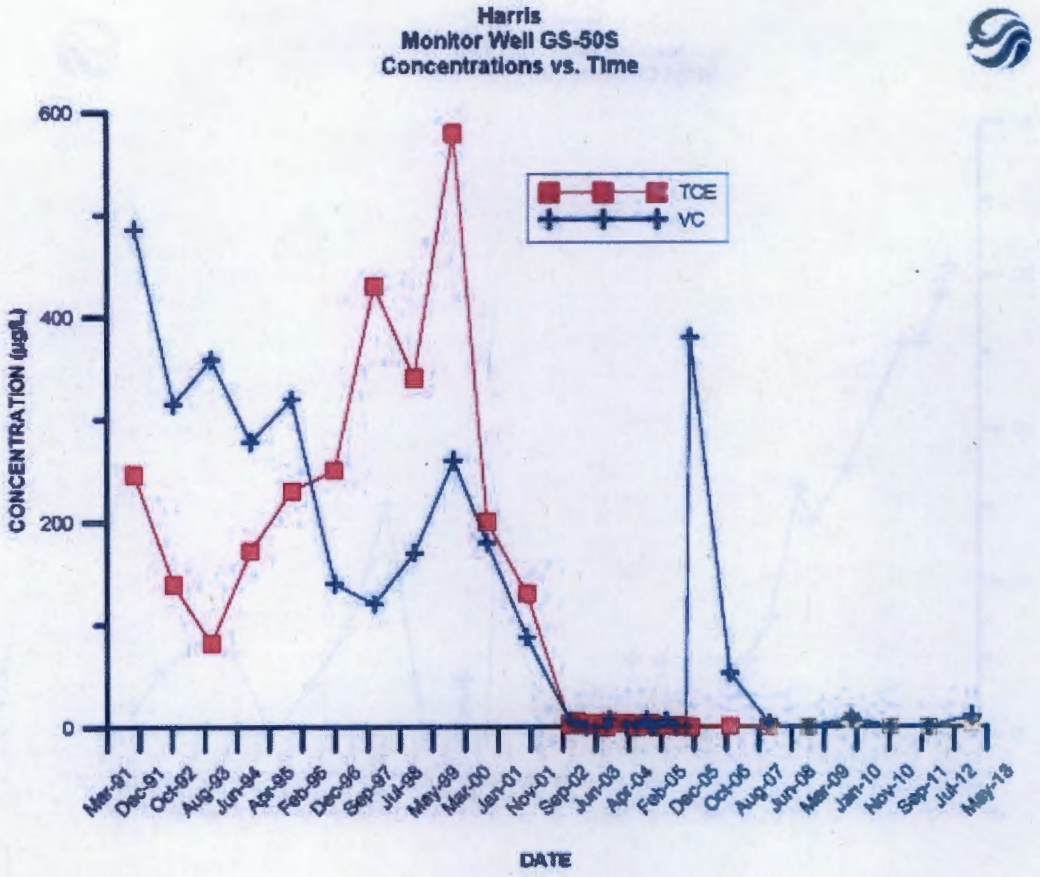
Harris
Monitor Well GS-50S
Concentrations vs. Time
TCE
VC
CONCENTRATION (µg/L)
600
400
200
0
Mar-91
Dec-91
Oct-92
Aug-93
Jun-94
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
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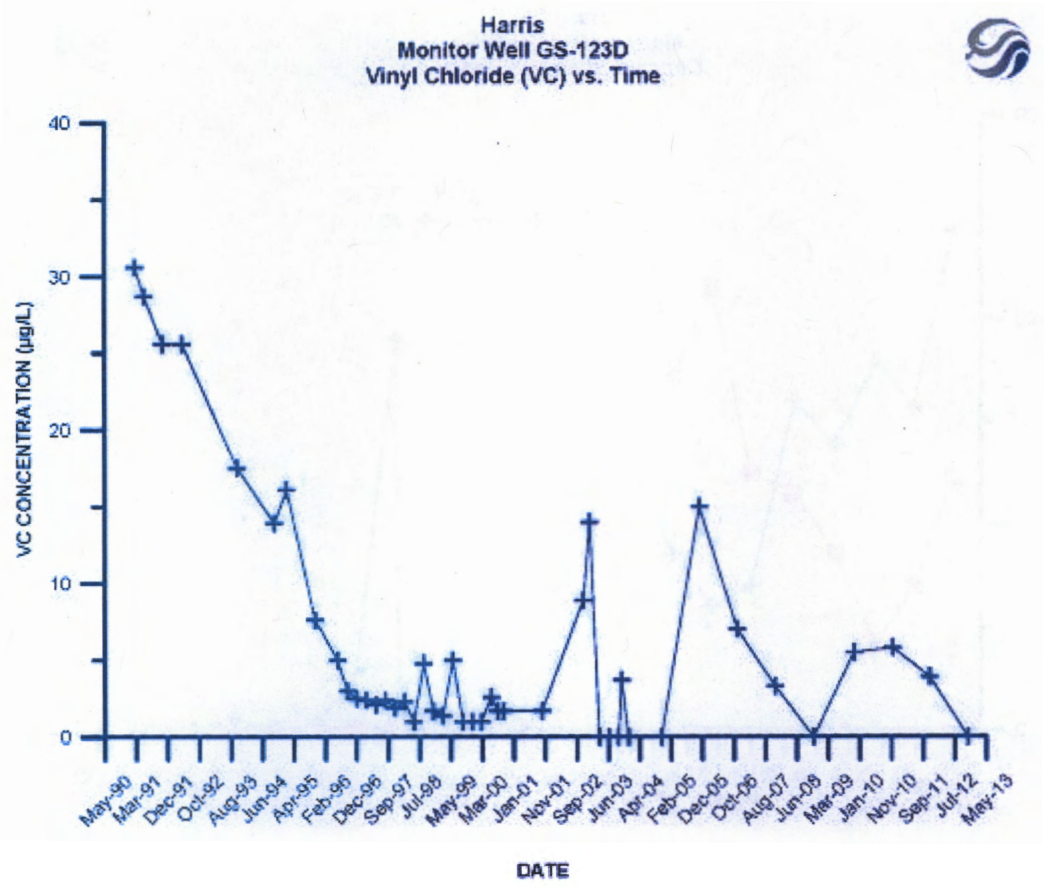
Harris
Monitor Well GS-123D
Vinyl Chloride (VC) vs. Time
VC CONCENTRATION (µg/L)
40
30
20
10
0
May-90
Mar-91
Dec-91
Oct-92
Aug-93
Jun-94
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
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Jan-10
Nov-10
Sep-11
Jul-12
May-13
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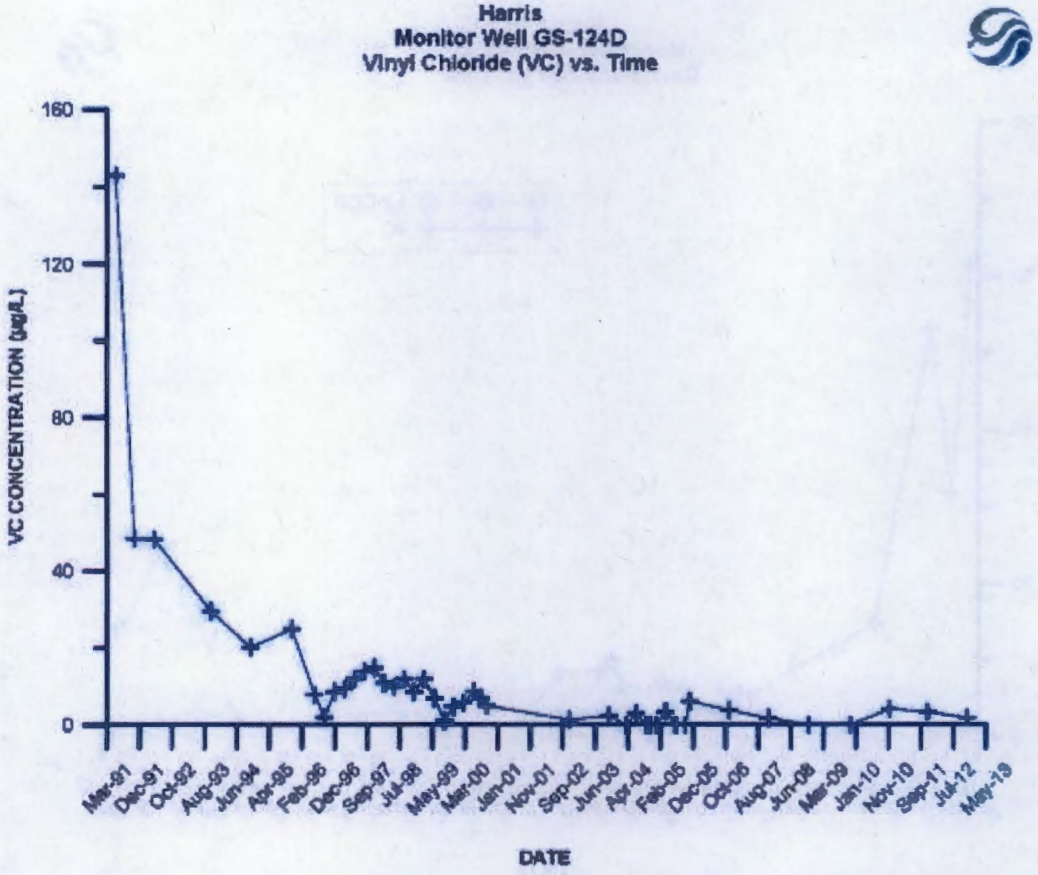
Harris
Monitor Well GS-124D
Vinyl Chloride (VC) vs. Time
VC CONCENTRATION (ug/L)
160
120
80
40
0
Mar-91
Dec-91
Oct-92
Aug-93
Jun-94
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
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Jan-10
Nov-10
Sep-11
Jul-12
May-13
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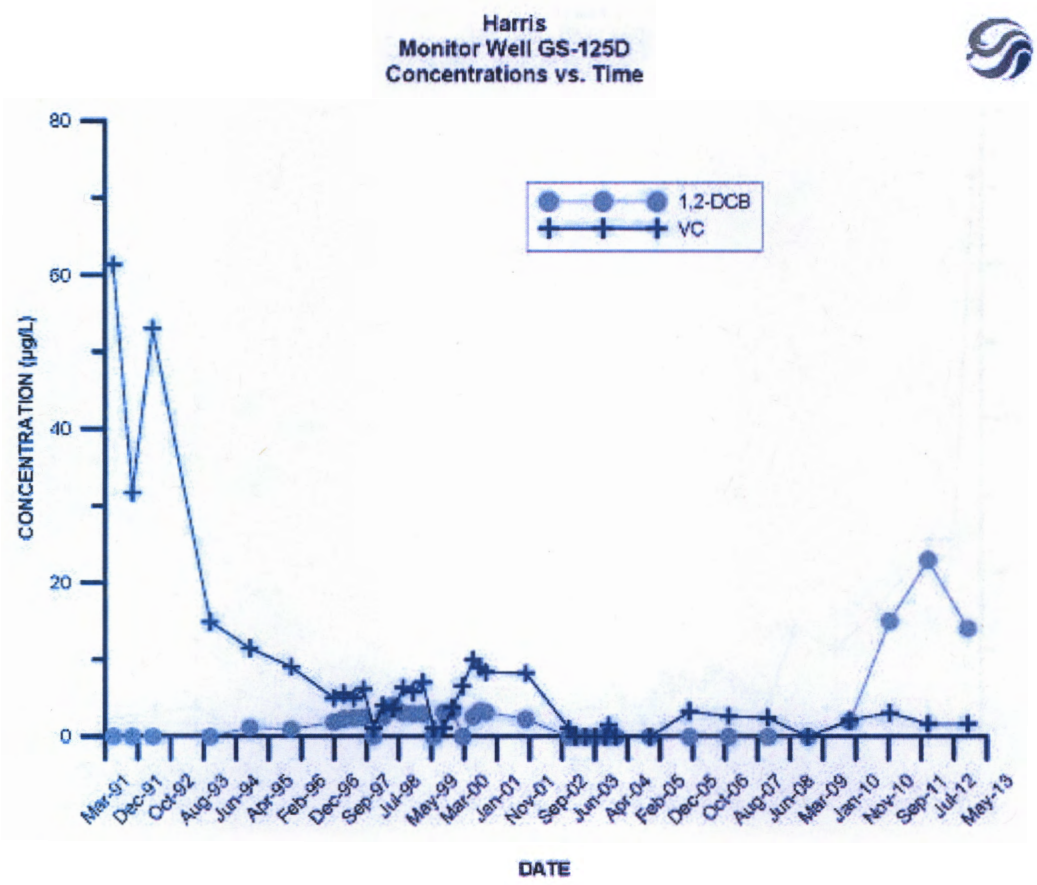
Harris
Monitor Well GS-125D
Concentrations vs. Time
1,2-DCB
VC
CONCENTRATION (µg/L)
80
60
40
20
0
Mar-91
Dec-91
Oct-92
Aug-93
Jun-94
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
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Jan-10
Nov-10
Sep-11
Jul-12
May-13
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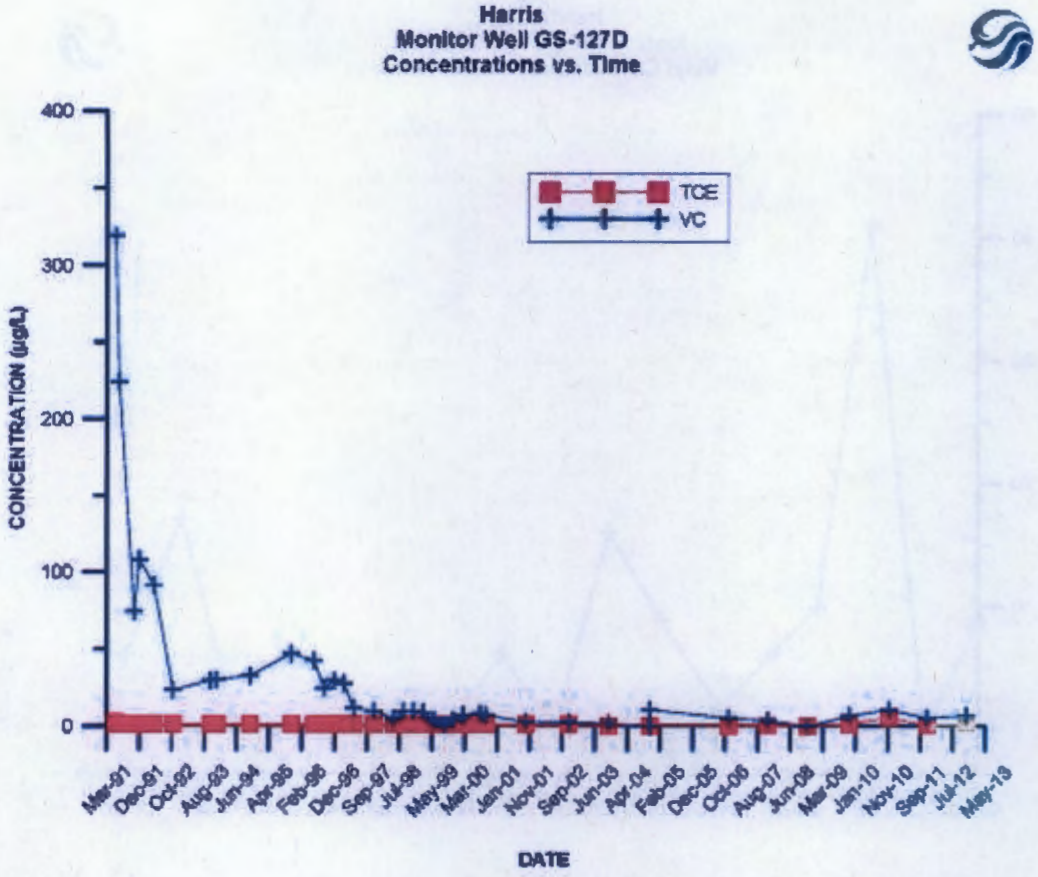
Harris
Monitor Well GS-127D
Concentrations vs. Time
TCE
VC
CONCENTRATION (µg/L)
400
300
200
100
0
Mar-91
Dec-91
Oct-92
Aug-93
Jun-94
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
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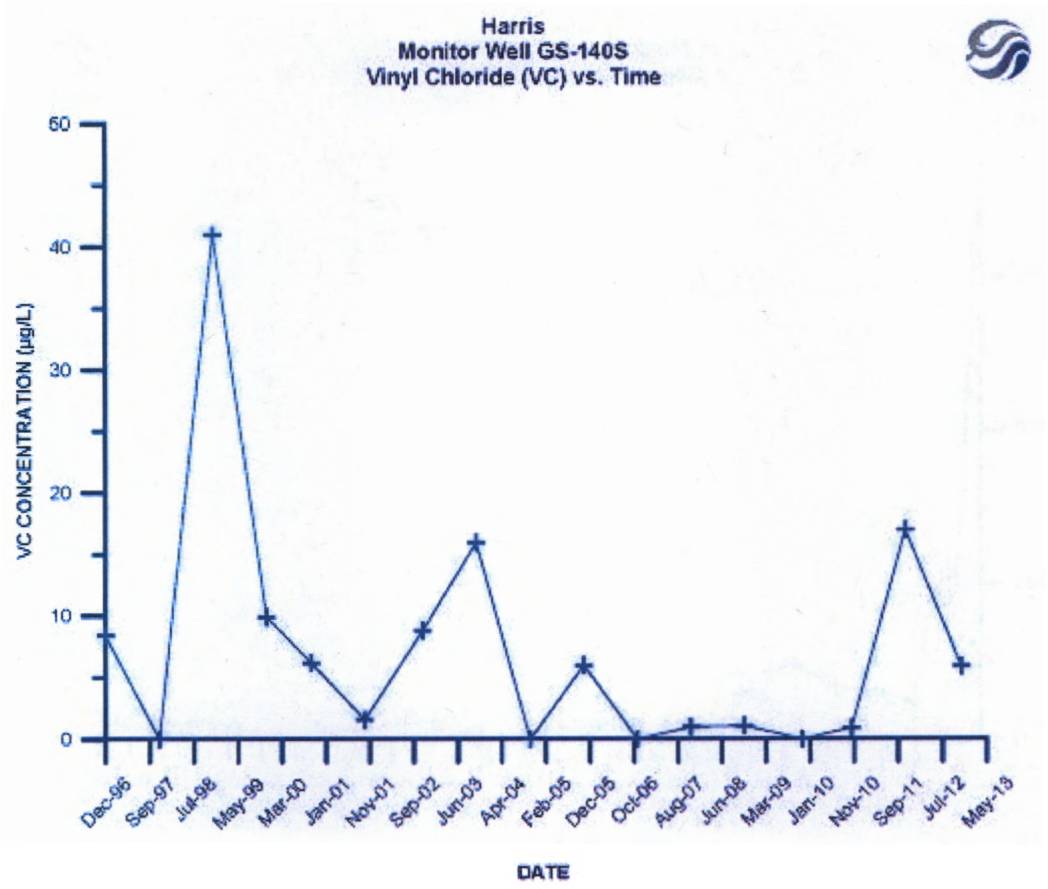
Harris
Monitor Well GS-140S
Vinyl Chloride (VC) vs. Time
VC CONCENTRATION (µg/L)
0
10
20
30
40
50
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
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Jan-10
Nov-10
Sep-11
Jul-12
May-13
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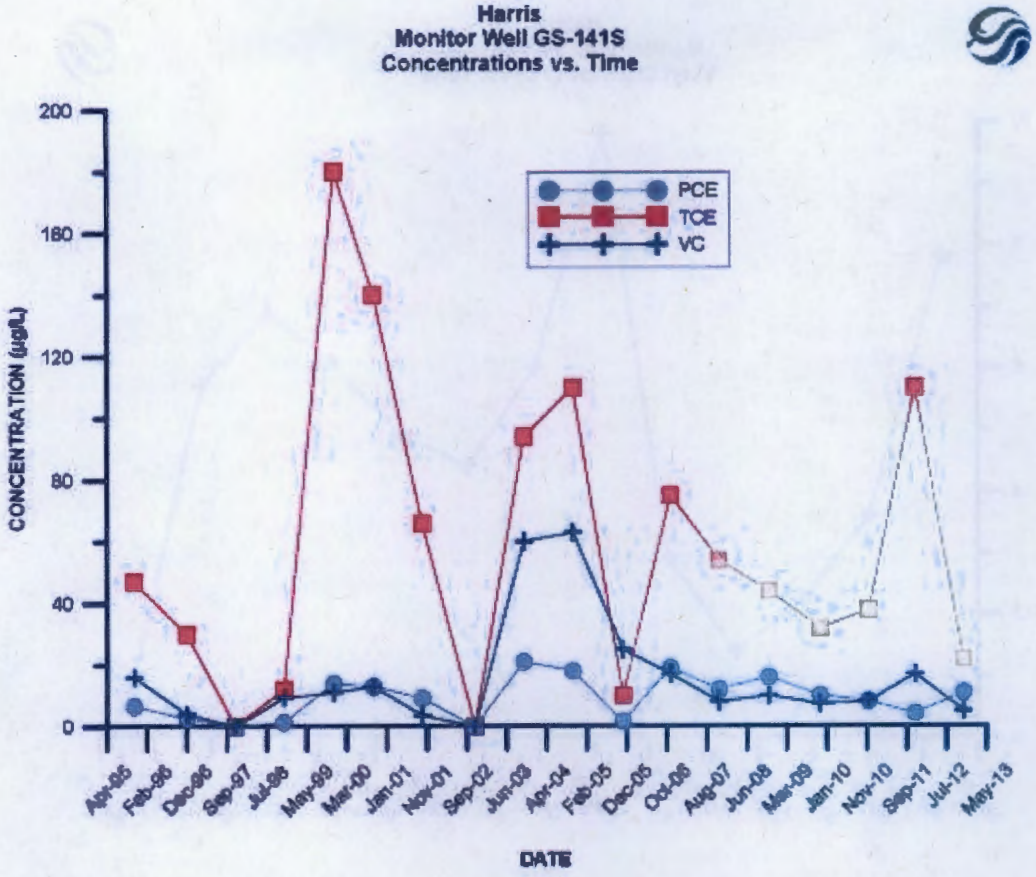
Harris
Monitor Well GS-141S
Concentrations vs. Time
PCE
TCE
VC
CONCENTRATION (µg/L)
200
180
120
80
40
0
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
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Sep-11
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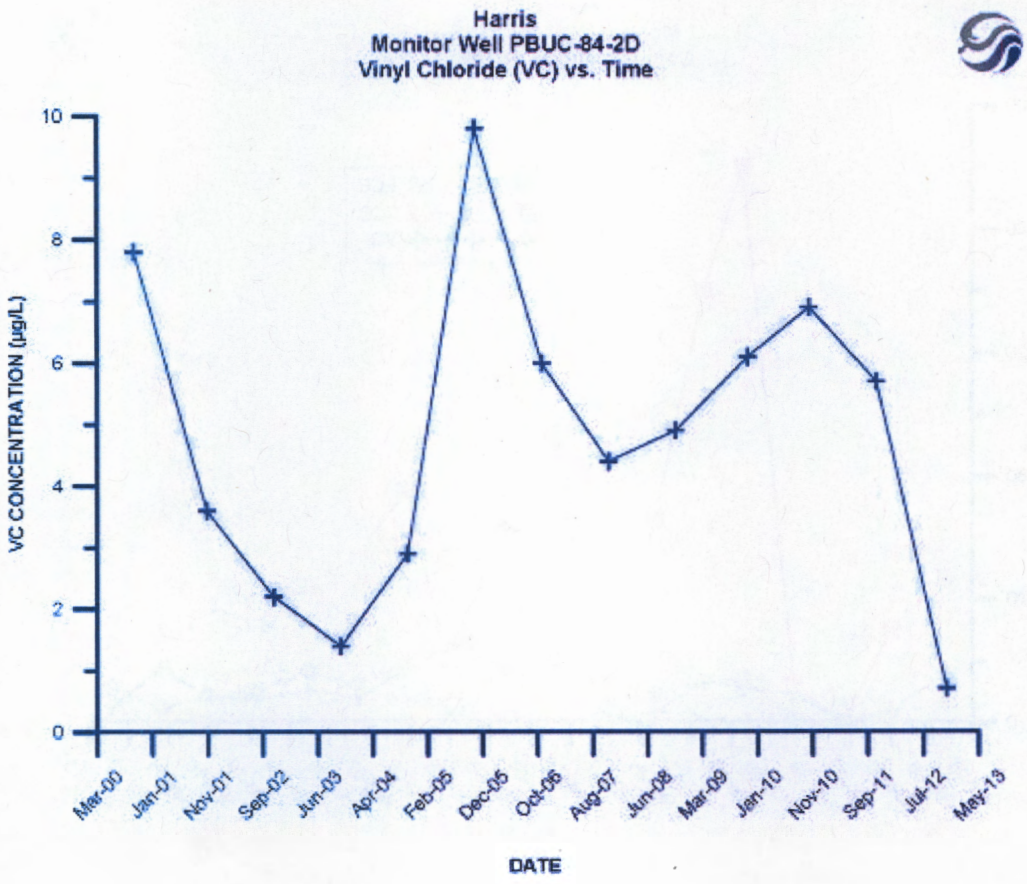
Harris
Monitor Well PBUC-84-2D
Vinyl Chloride (VC) vs. Time
VC CONCENTRATION (µg/L)
10
8
6
4
2
0
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
Mar-09
Jan-10
Nov-10
Sep-11
Jul-12
May-13
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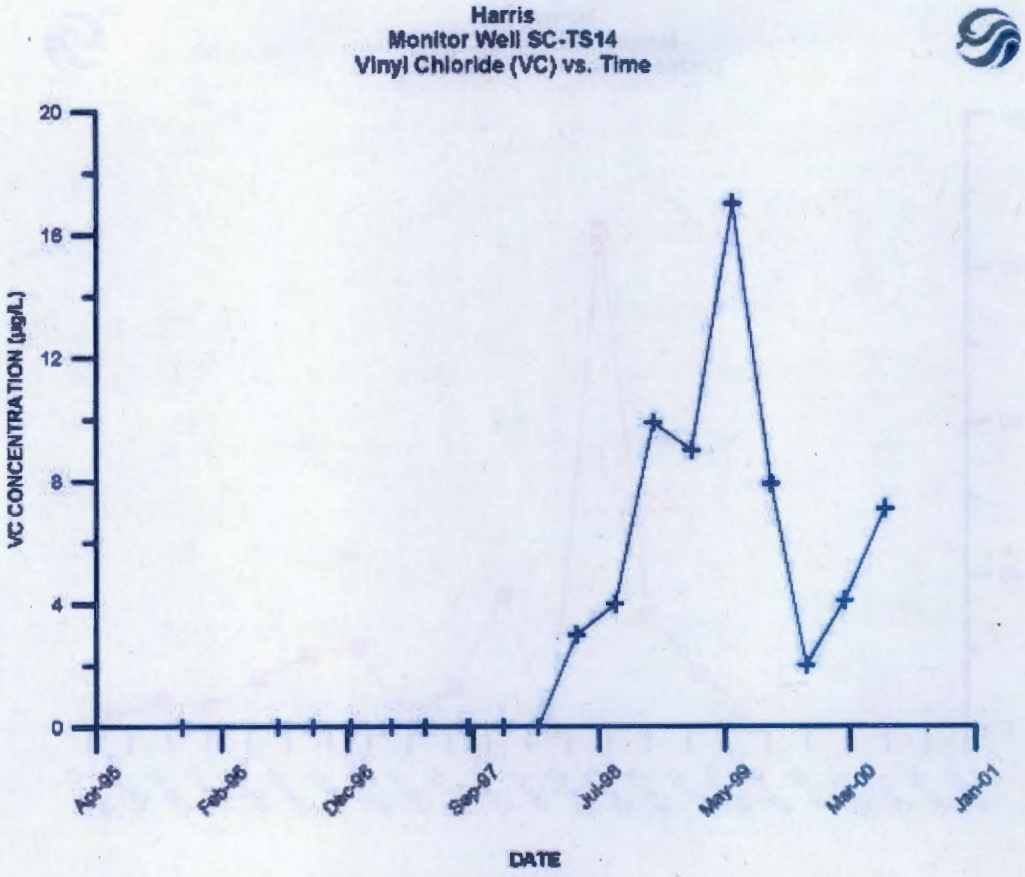
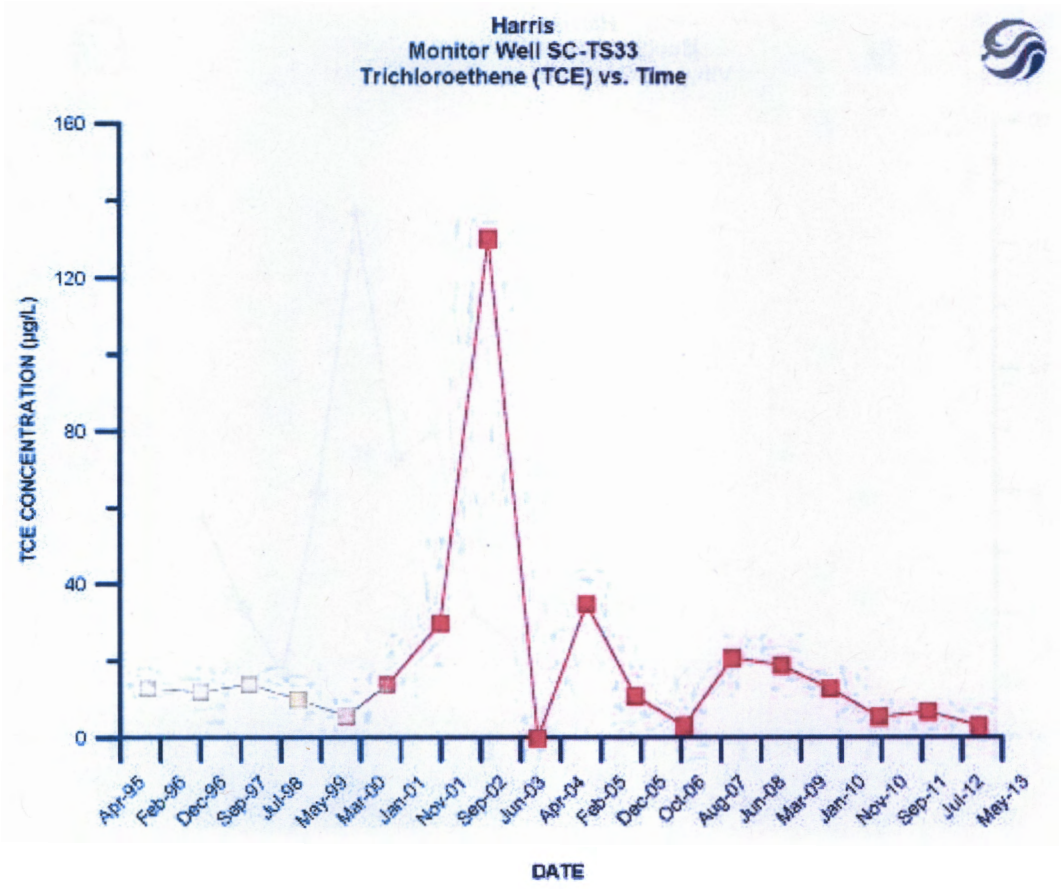

Harris
Monitor Well SC-TS14
Vinyl Chloride (VC) vs. Time
VC CONCENTRATION (ug/L)
20
16
12
8
4
0
Apr-96
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
DATE


Harris
Monitor Well SC-TS33
Trichloroethene (TCE) vs. Time
TCE CONCENTRATION (µg/L)
160
120
80
40
0
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
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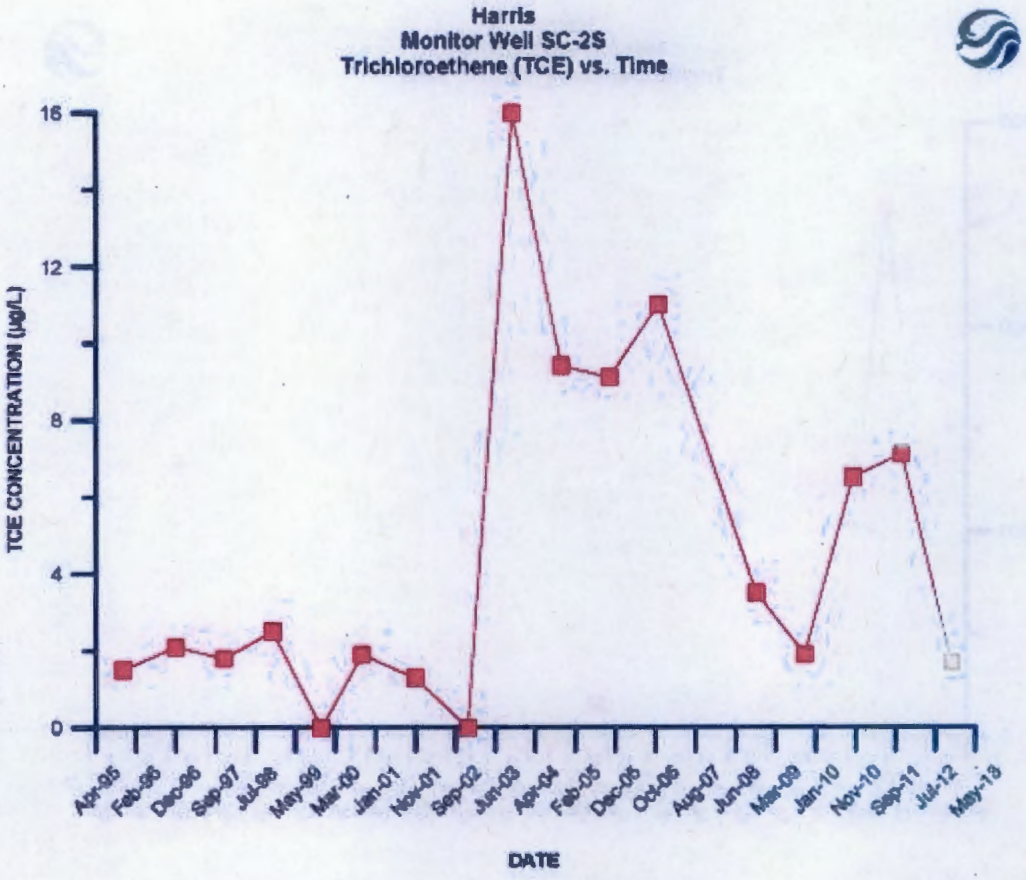
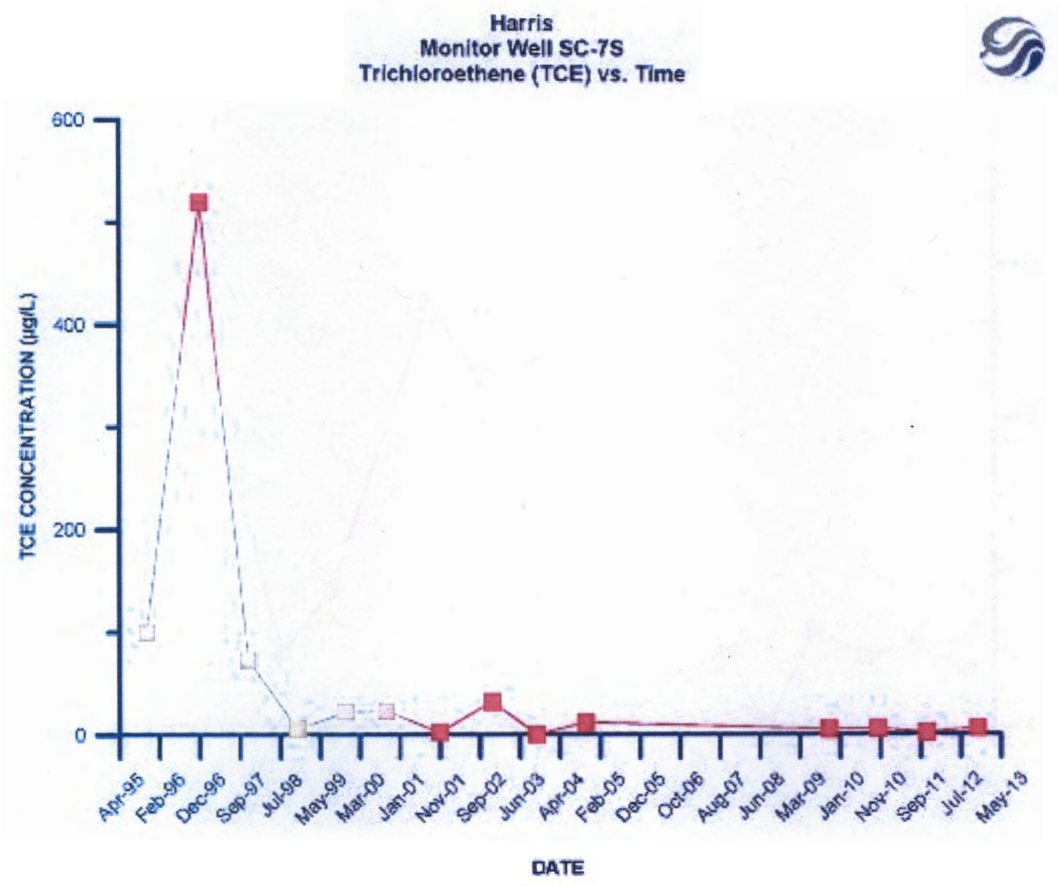
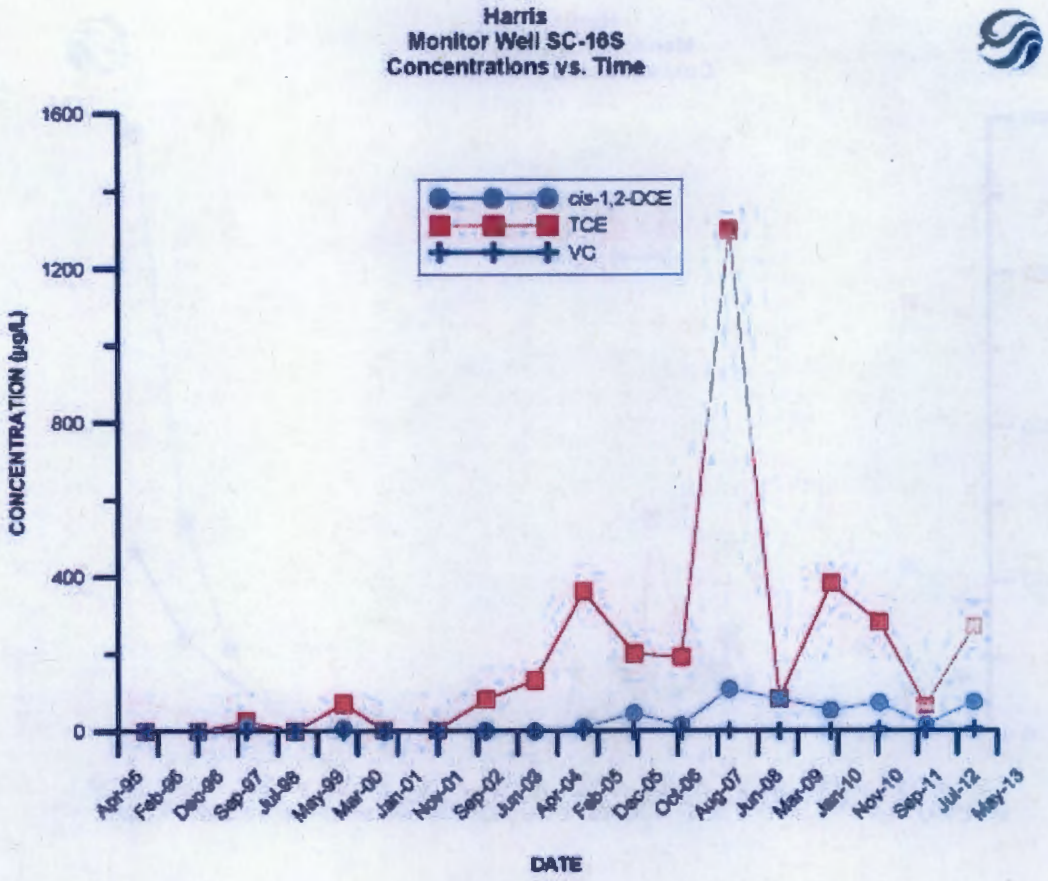
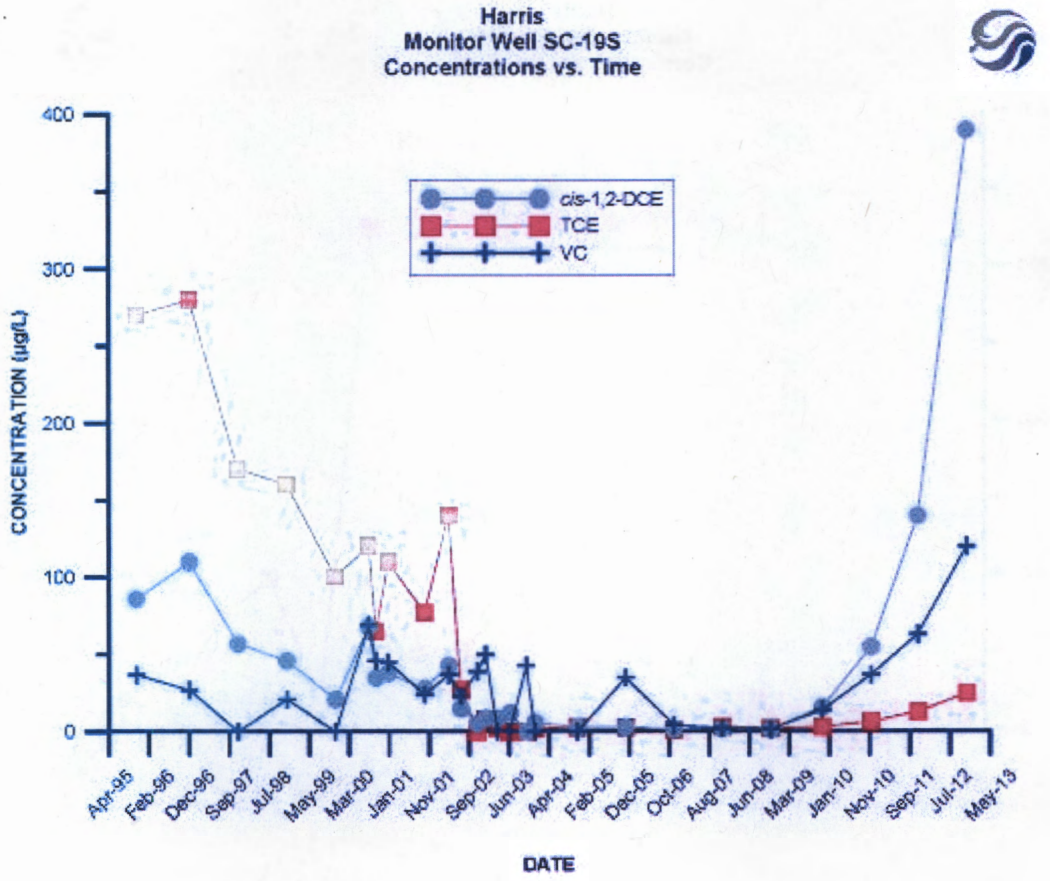

Harris
Monitor Well SC-2S
Trichloroethene (TCE) vs. Time
TCE CONCENTRATION (µg/L)
16
12
8
4
0
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
Mar-09
Jan-10
Nov-10
Sep-11
Jul-12
May-13
DATE


Harris
Monitor Well SC-7S
Trichloroethene (TCE) vs. Time
TCE CONCENTRATION (µg/L)
600
400
200
0
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
Mar-09
Jan-10
Nov-10
Sep-11
Jul-12
May-13
DATE


Harris
Monitor Well SC-16S
Concentrations vs. Time
cis-1,2-DCE
TCE
VC
CONCENTRATION (µg/L)
1600
1200
800
400
0
Apr-96
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
Mar-09
Jan-10
Nov-10
Sep-11
Jul-12
May-13
DATE


Harris
Monitor Well SC-19S
Concentrations vs. Time
cis-1,2-DCE
TCE
VC
CONCENTRATION (µg/L)
400
300
200
100
0
Apr-95
Feb-96
Dec-96
Sep-97
Jul-98
May-99
Mar-00
Jan-01
Nov-01
Sep-02
Jun-03
Apr-04
Feb-05
Dec-05
Oct-06
Aug-07
Jun-08
Mar-09
Jan-10
Nov-10
Sep-11
Jul-12
May-13
DATE