STATE WATER RESOURCES CONTROL BOARD'S PANEL ON THE LEAK HISTORY OF NEW AND UPGRADED UST SYSTEMS

UPGRADED UST RELEASE SITE EVALUATION CASE STUDIES

(UST Team 2 Report)

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TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

The Upgraded UST Release Site Evaluation Case Studies Team's task was to evaluate upgraded UST sites where Methyl tertiary Butyl Ether (MTBE) was present in the subsurface, for the purpose of determining site specific factors resulting in a release of MTBE. Local Oversight Program and Implementing Agency files for approximately 26 sites were reviewed and 22 of these sites were visited. Upon investigation of specific facilities, most releases appear to be fuel system leaks. Some of the apparent causes of leaks are faulty installations, poor maintenance, upgrades that do not fully comply with the regulatory requirements and poor facility operation practices. Very few sites show evidence of MTBE contamination only. Therefore, it is unlikely that MTBE is escaping fuel systems without a general leak in the system. In a few cases MTBE was the only constituent found. This may be due to the physical properties of MTBE; it is water soluble and does not easily adhere to soil particles. Other gasoline constituents, on the other hand, are not generally water soluble, adhere strongly to soil particles, and degrade easily in an oxygen rich environment. As a result, MTBE may move more rapidly and farther from the leak source, and be detected in monitoring wells ahead of other gasoline constituents.

Improvements in management of UST programs are needed. Detailed and regular inspections of current UST systems by qualified agency or third party inspectors could result in the identification of some of these problems and enable correction of the deficiencies. More intense scrutiny of installations by qualified regulators or qualified third party inspectors would increase the probability that UST systems are properly installed. Stricter guidelines to insure installation contractors are properly qualified to install UST systems could decrease the incidence of improperly installed systems. Existing State requirements are inadequate because they do not ensure that installation personnel have been trained for specific products. Many manufacturers, primarily tank and piping manufacturers, offer training in the proper installation of their products. Local regulatory agencies should verify that installation personnel have been properly trained in the product manufacturer specifications prior to installation of the system.

The UST regulations appear to be adequate for the design and construction of new systems. However, the requirements for upgrading existing systems, may allow for less effective systems to remain in use. A properly maintained and operated fully double walled or secondarily contained system is less likely to allow a release into the environment than a single wall system.

The scope of work for this team was limited to review of UST release sites where MTBE and other gasoline constituents were detected. No budget was allocated for the project and no actual testing was conducted by the team. The sample population used to conduct this survey of upgraded and new tanks was heavily biased because only facilities which experienced a prior release were addressed. As a result, at many of the sites it was not possible to determine if the release was from a previously removed system or the existing system which meets the 1998 upgrade requirements. Based on this fact alone the team recommends that an evaluation be conducted of UST systems on sites that have not

experienced a prior leak. This new study would reduce the amount of unknowns at a site and thus give a more objective view of the UST system.

II. BACKGROUND

The task of this team was to confirm or deny the ability of UST systems, that are compliant with the 1998 deadline requirements, to adequately contain the product they are storing, oxygenated fuel, and more specifically, to look at each component of the system and assess if it is functioning as designed, as installed, and as operated.

In general, there are three types of UST systems that comply with the regulations as meeting the 1998 deadline standards: double wall systems, single wall systems, and hybrid systems, the latter being a combination of the first two. A double wall system is a new system installed after July 1, 1987 and is comprised of a secondarily contained tank(s) and secondarily contained piping. Currently, some new systems upgraded or installed prior to 1995 do not include secondary containment for the dispenser area. Trench lined product piping systems that were used early on, around 1985 to 1989, also fit into the double walled category. Double walled systems are monitored with sensors that detect liquid or vapor that has collected in the interstitial space between the primary and secondary containment of the tank and piping. A sensor is also required in the dispenser pan. Single wall systems were typically installed prior to 1984 and have a single wall tank(s) with single wall piping. A single wall system storing petroleum that is constructed of fiberglass reinforced plastic (FRP) meets the 1998 standards with the addition of striker plates, a spill container, and an overfill prevention device. However, a single wall steel tank storing a petroleum product will need replacement or require lining or an internal bladder and cathodic protection, along with the previously mentioned upgrades for FRP tanks. A typical single walled tank system with pressurized lines is monitored by a combination of the following: Automatic Tank Gauge (ATG) or Statistical Inventory Reconciliation (SIR) and an Electronic Line Leak Detector (ELLD) with the capability of shutting down the turbine if a leak of 3 gph is detected or the system malfunctions or is disconnected. In addition, monthly (0.2 gph) and annual (0.1 gph) piping integrity tests must be performed. A hybrid system, installed between 1984 and July 1, 1987, consists of a double wall tank(s) with single wall piping. The tank is monitored with a sensor that detects liquid or vapor that has collected in the interstitial space between the primary and secondary containment of the tank. The single wall pressurized piping is monitored with an ELLD as described above.

The following approach and general considerations were used to evaluate the UST system included in the study:

1. UST systems included for possible consideration met the 1998 upgrade regulations and had a history of MTBE detected at the site. These were identified in various ways, by local agencies that implement the UST program, volunteers working on the panel, utility districts, and other public entities. A few of the sites evaluated came

from investigations initiated following the discovery of releases while installing electrical upgrades.
2. The evaluation included reviewing case files and visiting sites to attempt to identify specific problems associated with the UST system.
3. The sites were already being monitored for MTBE and other gasoline constituents which allowed members to establish contaminant trends over time. An increasing concentration suggested a possible release. However, review of this data could not always provide a definitive answer to whether the release was due to the new UST system or an old UST system previously removed from the site.
4. Once a potential site was selected, the local agency was contacted and asked to provide information relating to the design, installation, and operation of the UST system. The file information was evaluated for 1998 deadline compliance, evidence of an ongoing release, and other possible problems that might indicate the system was leaking or had leaked.
5. If the results of the evaluation met the upgrade and MTBE detection criteria then a site inspection was conducted to verify the UST system components and, if possible, identify leak sources.

III. Findings and Recommendations

Design, installation, and operation/maintenance of the UST system components were investigated and evaluated. For the purpose of this report, the findings have been summarized under the specific system components or activity where weaknesses or problems were identified.

Findings

1 All Tanks

Due to the lack of an allocated budget for testing or unearthing of tanks, the team had no means to identify leaks associated with the secondary containment of double wall tanks. However, a Lower Explosive Limit (LEL) meter was used to test the annular space of six USTs. Of these six USTs, three were found to have a high reading of flammable vapors.

2 Sumps

Turbine sumps were visually inspected at each facility (13 sites had sumps installed) and were identified as one of the potential problem areas of double wall UST systems. The purpose of the turbine sump is to capture leakage from the primary piping carried to the sump, by way of gravity, via the secondary containment piping or from the turbine itself. If the sump is not liquid tight the product can be released into the environment and not be detected by the monitoring system. Another problem resulting from leaking sumps is water intrusion. At six sites (# 1, 5, 7,13, 15, 23) sumps were observed to contain water and/or product. Build up of water in sumps is another complication that leads to false alarms and bypassing or disabling of monitoring systems. Five sites (#1, 7, 13, 15, 23) were observed to have the probes pulled up because of water intrusion. If the monitoring system is not properly operated, leaks from primary piping or turbines may go

undetected. Therefore, proper installation, maintenance and monitoring of the sumps is crucial to the containment and detection of leaks. Out of 13 sites that required sumps, nine sites (#1, 3, 5, 6, 7, 8, 10, 18, 23) were identified as having sumps which were improperly installed. Of these nine sites, five (#3, 7, 8, 10, 23) had penetration fittings were either improperly installed or completely missing. Current installation guidelines require sumps to be inspected during installation. There are no requirements to test sumps after the initial testing. The fact that nine of the systems were not properly connected may result from lack of proper installation inspection (i.e., the sump may have never been tested to see that it was liquid tight). Another possibility is that damage or failure may have occurred some time after the initial installation and testing.

3 Lined Trench as Secondary Containment for Piping

The integrity and design of secondary containment for piping systems with lined trenches are not easily evaluated because the end points of the liner are difficult to locate without removing surface features. Testing usually consists of filling the liner with water or removing surface features, and performing a visual inspection. Of the three sites where trench liners were known to exist, two (#8, 10) were improperly designed/installed and two sites (#10, 11) were improperly monitored. If a leak develops in the primary piping it may not be detected if the trench liner is improperly designed, monitored or leaking itself. Additionally, water intrusion into a trench system at one site (#11) caused nuisance problems that may have resulted in bypassing the monitoring system, similar to problems with turbine sumps.

4 Secondarily Contained Piping

Due to the lack of an allocated budget for testing or unearthing of UST systems, the team had no means to identify leaks associated with the secondary containment of double wall piping. Fourteen sites were identified as having integral secondarily contained piping. One system which was reviewed and visited (site #3) utilized non-fiberglass secondary piping (i.e., non bonded systems connections) utilizing hose clamp connections which may not remain liquid tight. In addition, several members of the team have been involved with inspecting sites where similar materials and method of construction have been used. This knowledge coupled with the team's work has prompted a concern for the ability of systems with hose clamp connections to remain liquid tight after installation.

5 Single Wall Piping

The team visited four single wall systems. Single wall fiberglass piping was found joined with steel unions (sites #17, 18) and some piping systems were put together with inadequate epoxy (site #18) and in one case (site #17) silicon caulking was used instead of epoxy. Evidence was found that piping systems were installed with epoxies that were not compatible with the piping material (sites #17, 18, 22). Additionally, gaskets within flexible connectors where found to leak when allowed to dry out prior to being placed back into service (site #3). A majority of all single wall systems were installed prior to 1984. At this time most communities did not have programs for regulating USTs. As a result, standards for installation of these systems and inspections for their construction and tightness may have been non-existent or inadequate.

6 Dispenser Area

Ten sites were observed to have dispenser area secondary containment (dispenser pans). Connections beneath dispensers were found to be leaking at 12 facilities. At 6 of these facilities (sites # 6, 7, 8, 10, 11, 22) the leaks were directly discharged to the environment due to the lack of dispenser containment. At 6 facilities (sites # 3, 4, 5, 9, 16, 19, 23) dispenser containment was adequate to contain the release. Dispenser pans are a part of the secondary containment requirements for new UST facilities (after 1987). However, due to problems with interpretation of this requirement, many systems were installed or upgraded prior to August of 1995 without dispenser containment. After 1995 clarification was issued by the State Board which stated that all new systems must install dispenser containment. In addition, the Board has given guidance suggesting that local agencies require facilities to install dispenser containment, for those not already in compliance, anytime concrete is broken in the area. As a result, a portion of the "new" UST population has not yet installed dispenser pans.

7 Leak Detection

For the leaking single wall piping systems discussed above (site # 17, 18, 22), the leak detection method or the integrity test used did not detect the leak. This was evidenced by the contamination found along the piping run. A possible answer for this problem may be that the leak threshold of the on-site monitoring equipment or third party testing equipment is not capable of detecting a very small release. Over time even a very small leak can contribute to an environmental problem. Improper operation or maintenance of the monitoring systems and disabling or ignoring alarms may also result in leaks going undetected (site #3).

8 Installation

Many of the problems with the UST systems appear to be a result of improper installation or poor maintenance. Many of the problems found with the UST systems may have been discovered during a thorough installation inspection, by either a local agency or a third party (sites #1, 3, 7, 10, 11, 17, 22, 23).

9 Enforcement

In some circumstances, local agency inspections had identified deficiencies in monitoring issues such as line and tank testing, but follow-up enforcement did not occur.

Recommendations

1 All Tanks

Further appropriately funded study is needed to evaluate the integrity/compatibility of double walled tanks.

2 Sumps

State regulations/guidance for proper installation and periodic inspection of sumps should be developed.

3 Line Trenches as Secondary Containment for Piping

Require that all secondary trench lined systems be properly maintained, monitored and periodically tested for tightness.

4 Secondarily Contained Piping

Require that all secondary containment systems, regardless of type, be properly maintained, monitored, and periodically tested for tightness.

5 Single Wall Piping

All single wall systems should be investigated to ensure that they were properly installed.

6 Dispenser Area

Develop a phase-in approach to ensure dispenser containment is properly installed, maintained and periodically inspected at all facilities. The phase-in approach may take into account site specific risk factors.

7 Leak Detection

Develop better testing methodologies for single wall piping systems. If better methodologies cannot be developed or utilized, all single wall piping systems should be evaluated for replacement using a phase-in approach that may take into account site specific risk factors. Stricter enforcement of monitoring system regulations may help insure monitoring systems are properly operated and maintained.

8 Installation

Ensure that all UST systems are properly inspected during installation by trained inspectors and regularly maintained by trained and qualified owners and operators. In addition, UST facilities should be inspected during all phases of installation and at regularly intervals during operation.

9 Enforcement

Ensure that non-compliance is followed by appropriate enforcement. Ensure that local agencies have a mechanism in place to cite, fine, or otherwise easily enforce compliance requirements.

Appendix I

Site Summaries

Lead Agency: County of El Dorado
Site Address: South Lake Tahoe, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall FRP Owens Corning (2@10,000) installed 9/28/85
Piping: Double wall flex, Total Containment, Enviroflex installed in 5/93
Dispenser Containment: yes, Total Containment deep boxes
Sump: yes, Total Containment
Spill: Yes, OPW
Overfill: Yes, OPW SO61 drop tube
Striker Plate: yes
Vapor Recovery: Stage I - coaxial, Stage II - balance

Compliance Monitoring:

- Upgrades were done in 1993 by Fillner. At this time sumps and dispenser containment was installed although there are no sensors in the dispenser pans.
- Tidel EMS-3000 for interstitial monitoring tanks and sumps.
- There is a copy of a tank test in the file but it was done on 9/5/97. This was before the two consecutive fails.
- Although it is not required for a double wall tank, they are also using SIR, Simmons, and failed the months of 12/97 , 1/98, and 2/98. There is a tank test by ProTank on 4/3/98 that gave the system a pass for both the tank and the piping.
- Monitor certification form completed on 9/5/98 verified that there are 3 interstitial monitors.
- There are Red Jacket and Vaporless MLLD on the piping.
- No monitoring plan is available for the facility

Site Visit: (10/5/98)

- This site does not have any visual evidence of leaks.
- No sensors were found in the dispenser containment.
- Turbine sump were dirty but had no visual evidence of leaking.

Site Investigation:

- Soil sampling was done at the site in 1993 when the sumps and dispenser pans were installed. No Detect was the result for all the analytes.
- No Unauthorized Release Form for this site to date.
- On June 18, 1998 a Notice to Submit Workplan for Site Investigation was issued by the Regional Board. This action was initiated when 377 ppb MTBE was found in a monitoring well up gradient to the site at a former Rotten Robbie station. This site had always been ND for MTBE and the facility had just recently reported a release based on a fail on their SIR (dates above).
- A report will be sent to the Regional Board by October 1, 1998 that identifies probable leaks.

Action:

The report by Fluor Daniel GTI (9/28/98) found some MTBE and very low levels of Benzene at 0.384 ppb and THPg at 31 ppb in the soil. In the ground water higher levels of MTBE at 212 ppb, Benzene at 170 ppb and THPg at 2.1 ppb were detected. The report suggests that a further study of the site be conducted.

Conclusions:

- This site meets the 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- From the site investigation there were no visible signs of a release from the current system.
- The agency might consider requiring turbine shutdown at this facility since compliance for piping integrity testing seems to be an enforcement issue.

Lead Agency: County of El Dorado, Regional Water Quality Control Board, R6, South Tahoe Public Utility District

Site Address: Meyers, CA 95501

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel FPR clad tanks. 2 (compartmentalized) @ 20,000 Joor - installed on 7/24/96
Piping: primary piping fiberglass-Ameron, secondary containment Total Containment-blue HDPE put together with clamps.
Dispenser Containment: yes, Bravo Box with floats
Sump: yes, Western Fiberglass
Spill: yes, *type unknown*
Overfill: Yes, mechanical float valve in fill tube
Striker Plate: yes
Vapor Recovery: *type unknown*

Compliance Monitoring:

- EBW Auto Stick is being used to monitor the interstitial space and the turbine sumps.
- Red Jacket LLD, XLP
- Repairs are reported to have been done to the regular piping without permit from the local agency.
- No monitoring plan is available for the facility
- No piping integrity tests were available for the site although the piping system does not have shutdown a 3 gph leak.

Site Visit (8/11/98)

- At the time of the team visit the monitoring system was found to be turned off at the breaker and when turned back on was not functional. Therefore, the team was unable to verify the components of the monitoring system. The system is listed as having automatic shut off.
- Both the premium and the diesel were not dispensing product (paper bags over the nozzles).
- The diesel dispenser pan had both product and water in it and the float switch in the box had not triggered the shear valve. Upon inspection with a flashlight we could see that product was leaking from the dispenser piping above the shear valve.
- The was no key available for the other dispensers, the key had broken off in the lock.
- The turbine sumps were inspected and the premium sump had a mixture of water and product. Apparently there is a leak in the primary piping. The sensor was pulled up so that the alarm would not go off.
- There was no significant amount of liquid present in the regular turbine sump. This may be due to a suspected leak in the secondary piping.

Site Investigation:

- There was also a complaint filed about dumping of product at the site on (3/15/94)
- There are two Unauthorized Release Forms (UFR) for this site. The first was for the tank removal (7/26/96) and the second was a leaking diesel pump on the old system (2/16/96)
- A leak was detected by the monitoring equipment and confirmed by a piping tightness test. It was found to be a Flextite flex connection under the dispenser pan on the regular unleaded line. The secondary containment was not tested during investigation of the leak and not tested after the leak was repaired.
- Product in the sump was detected after the repairs had been made. The lines were tested again and a leak in the secondary containment was found in addition to a leak in the unleaded plus line.
- We have copies from a on site investigation but it provides no date. GPT-1-14 at 2,800ppb, GPT-21-22 at 3,900ppb, GPT-29-22 at 3,500ppb (these are the highest readings)
- Lahontan Regional Board is currently in charge of remediation that had been implemented in order to contain the plume.

Action: None apparent at this time (8/11/98)

Actions to be taken:

- The facility was closed down on 8/12/98 by El Dorado Co Health.
- A work plan was developed to find the source of the ongoing leak on the site. Helium testing will be used to located the leak in the regular and super lines.

Regular Piping

Secondary Containment

- 9/18/98 Two clamped joint areas were found to be loose and hole was found.
- 9/24/98 Failed a pressure test
- 9/24/98 Two clamps are tightened and the hole is temporarily patched to continue testing. Another leak is found and a clamp is tightened.
- 10/2/98 The primary piping passed the pressure test. The secondary containment is fixed now that the system is tight.
- 10/2/98 More leaks are found in the secondary containment and clamps are tightened.

Regular Tank

Turbine Sump Area

- The electrical penetrations for the conduit to the turbine are the source for leakage from the sump. The penetration fittings were improperly installed.

Super Piping

Primary Containment

- 9/24/98 Failed pressure test
- 9/28/98 Leak was found at the flex connector under the dispenser.
- 10/1/98 The flex connector was replaced and the pressure test passed.

Conclusion

- This site meets the 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- Prior to the team visit the monitoring system had detected a leak in the primary regular unleaded piping. Once the piping was repaired proper procedures were not followed to ensure that the line was free from any further leaks. This are inspection and enforcement issues. Any time piping is repaired the primary, as well as the secondary piping should be pressure tested to ensure that the repair was effective and the system was put back together properly.
- At the time of the team's visit the site was unmonitored. The system's power had been disconnected by the facility operator by switching off the circuit breaker.
- At the time of the team's visit the facility had two leaks to address, the diesel dispenser and the primary premium piping. In addition, there were leaks found in the secondary piping after the initial repairs were made.
- The primary diesel piping was found to be leaking in the dispenser area and as a result of the dispenser containment the release was not allowed to reach the environment.
- The agency might consider requiring turbine shutdown at this facility since compliance for piping integrity testing seems to be an enforcement issue.
- During the repair of the system the premium turbine sump penetration fittings were found to be installed backwards. As a result the product that leaked from the primary and was carried to the sump was allowed to seep out through the improperly installed penetrations. It is not known why the monitoring system did not detect this condition although improper use or alteration is suspected.

Lead Agency: County of El Dorado
Site Address: Meyers, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall FRP 3 @ 10,000 & 1 @ 6,000 installed on 10/20/90. *Xerxes*
Piping: Double wall FRP was installed in 1990 and again in 10/96. At this time it is not know why the relatively new piping needed to be replaced.
Dispenser Containment: Yes, Western Fiberglass, deep box, with Beaudreaus installed in 10/96 when the second round of DW FRP went in 1996.
Sump: Yes, Western Fiberglass, FRP
Spill: Yes, OPW, 2100, 5 gallon
Overfill: Yes, OPW 61SO drop tube and a ball float valve.
Striker Plate: Yes
Vapor Recovery: coaxial

Compliance Monitoring:

- Facility Inspection report filled out for 7/2/97 and 8/11/98.
- No monitoring plan is available for the facility
- An EBW Autostick sensor is used to monitor the interstitial space and the turbine sump for the piping. (There are currently no sensors in the dispenser pans and this deficiency was noted on the inspection report on 8/11/98).
- The inspection sheet indicates that the sump sensors are not programmed to perform shutdown for the pump in the event of a release yet there have been no annual piping tightness tests submitted since the install in 1990. There was no indication of a piping tightness test done when the new DW piping and the dispenser pans were installed.

Site Visit: 10/1/98

- The facility has excellent housekeeping practices except for their diesel dispenser used by the public agencies.
- Beaudreau sensors have been installed in the dispenser pans.
- The dispenser pans were clean and dry although the piping under most of the dispenser (Wayne dispensers) was visibly wet. This may have been where the leaking originated prior to the installation of the dispenser pans.
- All the turbine sumps were clean, dry and the sensors were working.
- There is no visible evidence of a leak at this site.

Site Investigation:

- MTBE found in the municipal wells in the are prompted the investigation. Site investigation found MTBE in the ground water below the site.
- An Unauthorized Release Form was file in 1998 but release was supposedly from old tanks found at closure, 4 SW steel tar wrapped. The date on leak discovered is 9/12/90. The analysis at the time of removal did not detect any gasoline constituents only diesel and oil & grease.
- A new Unauthorized Release Form was submitted stating that the old tanks must have leaked when there was no apparent investigation into the new tank system. No sampling was done, in order to confirm this assumption, when the dispenser pans were installed. Sampling might have picked up the contamination that currently existed.
- In 1998 GP1 MTBE - soil 4-6' **180 ppb** and 14-16' **18 ppb** 2/18/98 near the pump islands.
- In 1998 GP3 MTBE - soil 14-16' **71 ppb** 60' north of GP3.

Action:

Installation of dispenser pan sensors is in progress.

Conclusions:

- This site meets the 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- The agency might consider requiring turbine shutdown at this facility since compliance for piping integrity testing seems to be an enforcement issue.
- From the site investigation there were no visible signs of a release from the current system.
- It is believed that the high levels of MTBE may have come from the dispenser piping prior to the installation of dispenser containment.

Lead Agency: El Dorado Co
Site Address: South Lake Tahoe, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel clad FRP compartmentalized 12,000/8,000, installed on 10/15/96, Modern Welding
Piping: Double wall flexible installed on 10/15/96, Enviroflex
Dispenser Containment: yes, Western Fiberglass
Sump: yes, Total Containment
Spill: yes, Emco Wheaton 6 gallon
Overfill: Yes, OPW 61SO drop tube
Striker Plate: yes
Vapor Recovery: Healy

Compliance Monitoring:

- No monitoring plan available for the facility, Interstitial monitor Incon TS1000 EFI is listed.
- Tank tightness testing by Tanknology NDE Vacutest on 8/23/97
- Piping tightness testing by Tankннology on 8/23/97
- Install sheet says that the system has auto shutdown for the turbines.
- No inspection since installation in 10/96
- No annual maintenance of monitoring equipment
- Vaporless LD2000 MLLD in use.
- A report from TerraVac on July 20, 1998 gives details on the status of the UST system. This report suggests that the system was improperly installed and not properly maintained and operated.
- The report states:
    - ♦ The dispenser pans contained 25 to 40 gallons of water and sludge. Piping penetrations may be the culprit here.
    - ♦ The piping does not flow back towards the piping sump.
    - ♦ One of the dispenser pans was grossly deformed. The product-pipe test collars were still in place and tightly fastened, showed deterioration, and were improperly installed.
    - ♦ Levels of MTBE in the liquid sampled from the turbine sumps and dispenser pans are as follows: M-1 and 2 are 23,000 and 22,000 respectively and D-1 through 5/6 are 11,000, 35,000, 89,000, and 44,000 respectively.
    - ♦ The vapor system would not pass initial testing and was repaired.
    - ♦ Maintenance records could not be located at the site.
    - ♦ The current filters are not dated and maintenance records could not be located by the station attendant. Filter changing records were not available.

Site Visit (10/5/98)

- This site has experienced problems associated with high ground water.
- Housekeeping practices at this facility were not good.
- The Enviroflex piping was joined together with clear small plastic tubing connecting the pipe interstices in the dispenser pans only. The secondary was open in the turbine sumps (at the tanks). Any leaks in the primary pipe should flow back to the turbine sumps. The liquid would accumulate in the turbine sumps until the liquid sensor detected the liquid, and set off the alarm.
- Liquid (a mix of water and fuel or only water) was visible in sumps and the sensors had been pulled up so that the alarm would not go off.
- To verify that the alarm was functional it was placed in the liquid in the bottom of the sump and it did go off with a visual and audible alarm. Neither of the turbines were running so it was not possible, at that time, to tell if the system had shutdown for the turbine.
- The dispenser pans were not equipped with sensors.

- The dispenser pan and piping looked as if it had leaked in the past. There was a build up of debris in the bottom of the pan that appeared to have been wet a some point.

Site Investigation:

- Tanks were removed on 9/9/91 and it is not clear why there were no tanks at the site from 1991 until 1996.
- UFR was filled out in 1991 due to the tank closure.
- MTBE was first discovered on the site from sampling analysis in February 1997.
- The most current monitoring results are from 12/97 and describe injecting diluted 10% hydrogen peroxide into the wells and the reduction of MTBE as a result.
- On June 26, 1998 the Regional Board issued a Notice to Immediately Conduct Remedial Activities at the site. A work plan was requested to describe the actions employed to determine if the dispensers are potential leak sources.

Action:

none other than listed above

Conclusions:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- There is no information in the files to suggest that any work has been done on this system since the 7/20/98 evaluation by TerraVac.
- This site has in the past and was, at the time of the team visit, bypassing the monitoring system by elevating the sensors in the turbine sumps. This is an enforcement issue.
- In the turbine sumps, the piping and the turbine should be considered potential leak sources and evaluated as such.
- The dispenser area should be investigated as a potential leak source.

Lead Agency: El Dorado Co
Site Address: South Lake Tahoe, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel clad with FRP, 1@ 10,000 and 1@ 8,000 installed on 9/89, Trusco
Piping: Double wall FRP installed on 10/89, AO Smith (see comments under site visit below).
Dispenser Containment: none
Sump: yes, FRP with no penetration fittings only caulk. The cover for the sump is the wrong size.
Spill: yes, found to be defective but replaced on 8/14/98
Overfill: Yes, OPW
Striker Plate: yes
Vapor Recovery:

Compliance Monitoring:

- No Monitoring plan in the file, Interstitial monitor Universal, Leak Alert
- Contract upgrade progress report for 8/12,13,14/98
    - Report suggests that the double wall piping does not currently terminate in the sump.
    - The sumps will be lake tested.
    - Overfill will be replaced.
    - Spill buckets will be replaced.
    - Shutdown of the sump sensor could not be confirmed by the contractor.
    - Contractor was to check the monitoring system.
    - Install fill sumps.
- From the inspection on 5/29/98 the alarms were not operating (turned off or not functional?) The probes in the turbine sumps were disconnected.
- A tank and piping test was performed by Champion on 5/8/98, Pass

Site Visit 10/1/98

- Very bad housekeeping practices at this facility.
- The installation is also a source of problems.

    The Sump

    - The piping, at the time of the visit, terminates in the turbine sump. This may have been a major source of leakage if there were or are any piping problems.
    - There are no penetration fittings on the sumps and caulking is used to seal the penetrations.
    - At the time of the re-inspection the sumps were said to have held water.
    - The sump covers are the wrong size.
    - The electrical conduit has been sealed with caulk and as a result of an incorrectly screwed on ....and the box is full of water.
- Dispensers have no pans. In all four dispensers it is impossible to tell by visual inspection whether the system is DW. In one dispenser there is a boot visible but it is still impossible to see the secondary containment.
- One dispenser was leaking product, the piping was wet and the ground stained.
- The cement around the dispensers was stained and look as if the hoses may have leaked. The staining may be due to the carelessness of the person filling the vehicle's tank and spilling fuel on the pavement.
- The monitoring system was functioning although there is no turbine shutdown, no ELLD, and no evidence of annual piping tests.
- The spill containment and the overfill protection devices have been fixed and appear to be in working order.

Site Investigation:

- UFR was reported on 11/30/89 as a loose fitting detected at the tank closure.
- UFR was reported on 1/31/97 as an unknown source discovered by subsurface monitoring.
- MTBE was first discovered on the site from sampling analysis in 3/25/96.
- On June 15, 1997 a Cleanup and Abatement Order was issued as a result of MTBE contaminating wells in the area. The facility owner/operator was to conduct quarterly monitoring, identify the cause of the gasoline constituents in the ground water, stop the release, define the plume, and implement a corrective action plan to clean up the area.
- The problem was found to be a defective overfill device and spill bucket. There may have been multiple events but this cannot be confirmed.
- Ground water monitoring was done on 4/18/98 and yielded an all time high level of MTBE at the site of 1,230,000 ppb. The recovery well that this sample was taken from was found to have 9.25 feet of floating product.

Action:

none at this time

Conclusion:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- Work has been completed on the turbine sumps at the site but it appears to be of an inferior quality. This is an installation issue as well as an enforcement issue
- The site lacks dispenser containment and as a result product has come in contact with the environment through bad housekeeping practices or leaking dispenser piping. Installation of dispenser containment at this site would prevent further contamination from the dispenser piping.
- The secondary piping does not visibly terminate in the dispenser area and until recently the secondary piping had not terminated in the turbine sump. This may have contributed to the level of contamination at the site. These are installation and enforcement issues.

Lead Agency: El Dorado Co
Site Address: South Lake Tahoe, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall FRP (3@ 12,000) installed on 9/95
Piping: Double wall FRP installed on 9/95
Dispenser Containment: yes, Bravo Boxes (float switches)
Sump: yes, fiberglass
Spill: yes, appear to be 3 gallon not 5 gallon
Overfill: Yes, ball float and the TLS-350 showed an overfill electronic alarm
Striker Plate: yes
Vapor Recovery: coaxial - EMCO Wheaton, assist

Compliance Monitoring:

- Tank & piping tightness testing by NDE Alert 1000 11/10/95 at install, pass.
- There is no monitoring plan available for the site.
- There is no evidence of any type of annual equipment inspection or piping tightness testing for the facility.

Site Visit (8/2/98)

- All of the dispenser pans' floats were out of adjustment. Even though there was standing water in most of the containment box sumps the float switch had not tripped the shear valve.
- Two out of the three turbine sumps had over 4" of standing water. It could not be determined (at this time) if this was due to groundwater or runoff from the pavement.
- The turbine sump sensors had been pulled up off the bottom of the sump so that the water in the sumps would not activate the alarms.
    - The amount of corrosion on the bolts on the manway covers suggests that they have not been removed for a long time.
    - The time of year, September, would indicate that the sump may have accumulated water from washing off the pavement and not rain water, yet the pavement appears to be sloped away from the covers. September would also find ground water at its lowest point of the year.
- The test boots on the secondary piping in the turbine sump were still on. These boots should have been slid back off the secondary after the piping had been tightness tested (11/10/95).
- The Veeder Root TLS-350 was not giving the proper responses, no alarm history could be brought up and we were unable to verify the number of interstitial sensors hooked up to the system (programming may be incomplete) and if the system was capable of turbine shutdown. From the records, it would appear is if they should have shutdown since they have not submitted a piping tightness test since installation of the piping. Since there is no monitoring plan for the facility we were unable to make a determination on the issue.
- General housekeeping at the site was very good.

Site Investigation:

- This site is one of three in the area, Meeks Lumber and The Muffler Palace, that may be responsible for an ongoing problem in the area. This problem was first discovered in 1984 by South Tahoe Public Utility District (STPUD).
- The site investigation was prompted by a nuisance report on 5/16/84, URF filed.
- Because of what STPUD called a lack of effective containment of the plume, a site hydrogeological investigation was started by STPUD in 1992.
- A Cleanup and Abatement Order was issued on January 1, 1985. The tanks tested tight but the turbine was found to be leaking.
- The UST system was removed in October of 1995 because they were believed to be hindering the progress at the site. Although, at removal the tanks appeared intact, however, the contractor did not carefully excavated the piping as requested by the RB and it was difficult to determine if the piping

was the source of the leak.
- MTBE monitoring started as early as 4/10/95 although there is only intermittent sampling for the oxygenate.
- The highest level of MTBE found on 4/2/98 is in MW3 located adjacent to the tank pit, 2084 ppb (↑↑ by 2004 ppb for the last quarters report) with TPHg at 2200 ppb (↑), Benzene at 19.8(↑), Toluene at 3.7 ppb (↓) and Xylene at 22.6 ppb (↓). Ground water fluctuation varies seasonally, depth to water from 1.83 to 12.00 feet.
- Draft work plan due on 5/12/97 initiated from a Cleanup and Abatement Order.
- On 6/26/97 an amended work plan was implemented.

Action:

- Currently, there is an air sparge/soil vapor extraction system in place. Additionally, hydrogen peroxide injection has been used at the site. The report concludes that due to a malfunctioning pump the effect of the hydrogen peroxide on the hydrocarbons will most likely not show in the second quarter monitoring report.

Conclusions:

- This site meets the 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- Liquid in the secondary containment is a problem in the turbine sumps and dispenser containment. Because of the water intrusion the monitoring devices in both location were altered and not functioning as designed. This is an enforcement issue as well as an installation issue.
- The source of water intrusion, from ground water or surface water, should be determined and efforts made to correct the problem. This are an enforcement and an installation issues.
- The test boots must always be removed from the secondary piping after a piping tightness test so that the system can function as designed. If the boots remain on any release will build up in between the primary and secondary piping and back up into the dispenser area that may not have secondary containment.
- The agency might consider requiring turbine shutdown at this facility since compliance for piping integrity testing seems to be an enforcement issue.
- The monitoring console was unable to give general information or an alarm history and there is no evidence of an annual maintenance check for the facility. This is an enforcement issue.
- This site has in the past and was at the time of the team visit bypassing the monitoring system by elevating the sensors in the turbine sumps. This is an enforcement issue.

Lead Agency: El Dorado Co.
Site Address: South Lake Tahoe, CA

Existing UST System Components:

System type: Pressure
Tanks: Single wall bare steel (tar wrap), 4 @ 12,000 with 2 being manifolded, that were installed in 1983. The tanks were lined by Chadborn in early August of 1994 and an impressed current system was installed.
Piping: Single wall FRP, A.O Smith, Red Thread, vent lines steel, vapor recovery FRP(only two observed at the site).
Dispenser Containment: none
Sump: none
Spill: Yes
Overfill: Yes, fill tube mechanical float
Striker Plate: Should have been installed when the tank was lined.
Vapor Recovery: Stage I -coaxial, Stage II -balance system

Compliance Monitoring:

- No documentation supporting the structural integrity of the tank, the lining certification, and the impressed current system could be found in the files. There is documentation stating that there was an ultrasonic and a visual inspection conducted by William D. Clark, PE and a cathodic protection certification by Daniel Chadborn.
- Monitoring listed as Veeder Root TLS 350, ATG and LLD.
- Facility inspection done on 4/14/93.
- Line tightness test done on 4/28/94 by Horizon with Arizona Instrument equipment.
- Facility inspection done on 5/14/97
- No monitoring test results have been submitted since 4/94.
- No groundwater quarterly monitoring reports have been submitted since 9/95.

Site Visit (9/2/98)

The team arrived at the site at 10:00 am to witness the removal of four single wall steel tanks that had been lined in the early 1988. One tank was sitting up higher than the other four tanks and over half way exposed. The other three tanks were only partially exposed with their ends still buried.

- The fumes from the excavation were strong and the soil was discolored and appeared to be wet particularly in the fill and turbine areas.
- Pieces of the lining material were laying around and seemed to be quite thin although they may have been from the manways that were pulled off or the top of the tank. A sample of the lining was examined and it appeared to be brittle and thin, approximately 62 mils (1/16 of an inch). The NLPA Standard 631 states that the lining should have a minimum thickness of 100 mils and an average thickness of 125 mils.
- A piece of the SW FRP piping was recovered and appears to have been leaking due to the varnished look along with a break in the fibers.
- At one dispenser it did not appear that all gasoline products had been piped with vapor return. The lines were not manifolded at this dispenser so that only phase 2 was available for the premium.
- The tanks were stained at the turbine and fill ends. It looked as if the turbines had been leaking for a long period of time.
- As a result of the removal taking longer than expected, the team was only able to witness one tank coming out of the pit. The tank was tar wrapped and some of it was still intact. The tank had some pitting and corrosion but no holes could be identified.

Site Investigation:

- URF filed in 3/17/87, leak discovered on 10/11/83 and recorded as a structural failure of the tank.
- There are 11 monitoring wells at the site, 1 vapor extraction well and 3 dual sparge wells.
- The facility report filled out by the LA says that they notices an area of collapsed asphalt on 5/13/98
- The permit for this facility was revoked by the LA on 8/13/98. The facility is scheduled to pull the

tanks and replace them starting on 9/2/98.

Action:

A new system is being installed

Conclusions:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site other than a limited visual inspection of the first tank that came out of the ground during the removal.
- From the wet look of the soil and odor emanating from the UST system it was apparent that the system had been leaking in both the turbine sump and dispenser area.

Lead Agency: Sacramento Co
Site Address: Sacramento, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall FRP (2@10,000 and 1@12,000) Xerses as per TOSCO. All three tanks contain gasoline.
Piping: Double wall FRP with flex joints in sump
Dispenser Containment: yes, fiberglass, without sensors
Sump: yes
Spill: yes
Overfill: Yes, drop tube
Striker Plate: not present or observed to be
Vapor Recovery: VaporVac system, Assist, Wayen

Compliance Monitoring:

- Veeder Root continuous interstitial monitor, TLS 350
- Vaporless LD2000 and Red Jacket FX1, MLLD, the last maintenance was on 5/6/98, pass.
- Facility maintenance was on 5/6/98 by Triangle Environmental
- Vapor system was tested on 2/23/97, pass.

Site Visit (10/26/98)

- Dispenser pans are dry and clean. Some of the piping under the dispenser appears to be seeping but not enough that there is any accumulation in the pans. The piping is hard piped into the dispenser with a short flex joint connecting to the piping below the shear valve.
- The dispenser pans are not monitored. The pans have been wired but there are no sensors present or any records suggesting the pans are visually inspected on a daily basis.
- The turbine sump also appear clean and dry. There were vapors present when the covers were taken off. This may be attributed to the vapor system.
- There are portions of the asphalt that look as if there could have been a spill. Dave will check the high level alarm history to see if this may have been a problem.
- Overall, this system appears to be tight and the facility is clean.

Site Investigation:

- New tanks were installed in 1987.
- Nine (9) monitoring wells, three (3) vapor extraction wells, and one (1) air sparging point installed at the site in 1987.
- Fiber trench was removed and the double wall piping was installed in 1996.
- MTBE has been tested for at the site since 12/1/95 in MW 1 and MW2. There has been an increasing trend with a few dips. The high being 6100 ppb in MW2 on 12/18/97 and a low of 37 ppb in MW 2 on 9/4/96.
- The release of MTBE is associated with TPH and both.
- The latest quarterly monitoring well reports show a rise in MTBE levels of MW1 & MW2.

Action:

none to date

Conclusion:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- Sensors should be installed in the dispenser pans.
- From the site investigation there were no visible signs of a release from the current system.

Lead Agency: Sacramento Co
Site Address: Folsom, CA

Existing UST System Components:

System type: Pressure
Tanks: Single wall FRP 3@10,000, installed on 1982, Owens Corning
Piping: Single wall FRP installed 1982
Dispenser Containment: no
Sump: yes, but not liquid tight
Spill: yes
Overfill: Yes
Striker Plate: yes
Vapor Recovery:

Compliance Monitoring:

- Automatic Tank Gauging done at site with a Ronan X76 ETM
- Red Jacket LLD were used to monitor the single wall piping.
- Annual tank tightness test done by TankTek 8/13/98
- Annual piping tightness test done by Tanknology NDE on 2/16/98, 2/20/97, 3/31/96

Site Visit (at the time of removal 01/98)

- Piping was tested tight but when excavation of the area was conducted to install the upgrades the piping fell apart at the joints.
- Soil contamination was present at the dispensers, which was later confirmed by testing.
- As a result, the piping was replaced with double wall FRP piping and dispenser pans.

Site Investigation:

- The site experienced a piping leak in 1988 that prompted remediation work at the site.
- In May of 1998 the site was upgraded by the addition of dispenser pans and turbine sumps. During this non required upgrade work inferior piping and contamination were found.
- Soil sampling results from EPA 8020 indicated that the piping under the dispenser had been leaking T-1 at 6.4 ppm MTBE.
- MTBE was also found to be present in the ground water at the site in January 1998 after sampling was done in a monitoring well adjacent to the tank. In soil at a depth of 16 feet, 0.86 ppm, and at a depth of 31 feet, 2.6 ppm. In groundwater at a depth of 18.11 feet, 4.7 ppm.

Action:

none other than listed above

Conclusion:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- The site was not properly inspected at the time of installation which lead to the inferior quality of the system's construction. These are installation and enforcement issues.
- The site lacks dispenser containment and as a result product has come in contact with the environment through bad housekeeping practices or leaking dispenser piping. Installation of dispenser containment at this site would prevent further contamination from the dispenser piping.

Lead Agency: Sacramento Co
Site Address: Sacramento, CA

Existing UST System Components:

System type: Pressure
Tanks: Single wall FRP 3@10,000, installed in 1982, Owens Corning
Piping: Single wall FRP
Dispenser Containment: none
Sump: none
Spill: yes, 1982
Overfill: none
Striker Plate: yes
Vapor Recovery:

Compliance Monitoring:

- Ronan X76 ATG
- Red Jacket mechanical line leak detector on the single wall piping.
- Annual line tightness testing on 7/29/97 (PetroTite) pass, 4/7/97 (Tanknology-NDE) pass, 3/1/96 (NDE) pass, 3/31/94 (NDE) pass.
- Using MIR as a leak detection method in 1995.
- The regular unleaded tank failed a tightness test in 1988.

Site Visit (at the time of removal 5/12/98) The removal was prompted by evidence of leakage when the piping was exposed to perform electrical upgrade work.

- Two piping joints came apart when the excavated piping was moved and both had evidence of leakage into the soil. The two types of FRP piping were incorrectly installed with incompatible epoxies.
- There was also evidence of product leakage below one of the dispensers that had a combination of steel unions and fiberglass at the dispenser hook up. The steel unions, not intended for burial, should never have been used in this type of application.

Site Investigation:

- Soil contamination was present at the dispensers and along one of the piping runs, which was later confirmed by testing.
- The five soil samples collected beneath dispensers contained TPPH, benzene and MTBE at concentrations ranging from ND to 1200 ppm, ND to 4.1 ppm, and ND to 120 ppm respectively.
- The soil samples were analyzed for MTBE using EPA Method 8260.

Action:

The single wall piping was replaced with double wall FRP piping

Conclusion:

- This site meets 1998 deadline standards.
- The team had no means of evaluating the tanks at this site.
- The site was not properly inspected at the time of installation which lead to the inferior quality of the system's construction. These are installation and enforcement issues.
- The site lacks dispenser containment and as a result product has come in contact with the environment through bad housekeeping practices or leaking dispenser piping. Installation of dispenser containment at this site would prevent further contamination from leaking dispenser piping.

Lead Agency: Sacramento Co.
Site Address: Sacramento, CA

Existing UST System Components:

System type: Pressure
Tanks: Single wall FRP 3@ 12,000 and 1@ 500 installed in 1983, the 2 Regular tanks are manifolded
Piping: Single wall FRP installed in 1983
Dispenser Containment: no
Sump: no,
Spill: yes, type unknown
Overfill: none
Striker Plate: yes
Vapor Recovery:

Compliance Monitoring:

- Automatic Tank Gauging done at site with a type unknown
- Red Jacket and Vaporless Mechanical Line Leak Detectors were used to monitor the single wall piping
- Annual tank and piping tightness test done by Triangle Environmental 10/6/97, 10/14/96, 9/21/95.

Site Visit (at the time of removal)

- The piping was found to be inferior quality at the facility. There were three different types of piping found: Ameron, Smith , and steel piping and fittings. These piping types were not installed as required by the manufacturer.
- As a result, this site will be re-piped and turbine sumps and dispenser pans will be installed.

Site Investigation:

- During a precision tank test on March 19, 1987 approximately 2,600 gallons of fuel was accidentally released to the subsurface.
- Due to the date of release it can be assumed that the fuel did not contain MTBE. Therefore, any MTBE found at the site would be from a new and ongoing release.
- The latest quarterly monitoring report for the site shows increasing levels of MTBE. At MW1, during the last year, MTBE has gone from 4,800 to 11,000 ppb. In MW3 all other gasoline constituents have shown decreases while the MTBE shows an increase, currently 57,000 ppb. It appears that all results have been from EPA 8020 not 8260.

Action:

- New piping has been installed.

Conclusion:

- This site meets 1998 deadline standards except for an overfill device.
- The team had no means of evaluating the tanks at this site.
- The site was not properly inspected at the time of installation which lead to the inferior quality of the system's construction. These are installation and enforcement issues.
- The site lacks dispenser containment and as a result product has come in contact with the environment through bad housekeeping practices or leaking dispenser piping. Installation of dispenser containment at this site would prevent further contamination from the dispenser piping.
- The high level of MTBE in MW1 near the tanks by be due to the lack of a turbine sump or may be from the tank itself. A closer look at the tank may be necessary to rule out further contamination.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall, FRP (2@ 10,000) Owens Corning installed in 4/1/88
Piping: Fiber trench installed on 4/1/88 and permitted as a DW system.
Dispenser Containment: *unknown, type unknown*
Sump: *unknown, type unknown*
Spill: yes, *type unknown*
Overfill: could not verify, *type unknown*
Striker Plate: *unknown*
Vapor Recovery: *type unknown*

Compliance Monitoring:

- The *tank/piping* is monitored with a Pollulert FD-102 and a Veeder Root TLS-250, ATG is used for inventory.
- On the service station monitoring system certification (7/10/96) the piping is recorded as SW and not a trench system.
- Piping tightness test was done 7/10/96 by NDE and passed
- No monitoring was found in the trenches.
- Site is currently monitored with a Gilbarco system.
- Could not verify dispenser containment by the trench.

Visit on 9/17/98

- The site was missing a number of the required components to meet the 1998 upgrade requirements.
- In addition , the monitoring system had been changed out without notification or inspection by the local and the site appeared to be poorly maintained in general.
- The annular space of the super tank was tested with a LEL meter and it registered as 30%**.**
- No monitors were found in the trench system.
- The site was being partially monitored by a Gilbarco system.

Site Investigation:

- URF was filed for a release on 1/8/86. The cause of the leak was a structural failure at closure. The agency records show the tanks were installed on 4/1/88?
- Free product was detected in a Pollulert well located adjacent to the UST on June 30, 1987. Three borings and four monitoring wells were installed at the site in July 1997. Soil and ground water contamination was detected. The site has been on a quarterly ground water sampling program since August 1987. The UST were removed in February 1988. Measurable thickness of free product has been detected in MW3 on three separate monitoring events. But, measurable free product thickness' have not been detected at the site since September 17, 1990.
- In May 1991 three additional wells (MW5, 6, & 7) and two borings (B8 & 9) were drilled. Hydrocarbons were detected in soil samples collected during the drilling of the borings and wells. Dissolved hydrocarbons were detected in MW6. Several well samples were analyzed for the presence of MTBE in 1992. Up to 1400 ppb was detected.
- The installation of the remediation system was completed by the end of December 1992 and operational by February 1993.
- Quarterly MTBE testing began on 1/5/96 with high levels of MTBE present in MW1, 2, 3, & 7 and RW1.
- The highest and current level of MTBE is on 3/24/98 of 72,000 ppb in GW in MW2 (in the tank pit area).
- The ground water flow is to the NW.

- Depth to water is 4.98 feet minimum, 18.74 feet maximum, and currently 6.84 feet.

Action:

None at this time

Conclusion:

- All of the system components could not be verified.
- The site inspection did not reveal any obvious leaks. However, it does not appear that the trench is being properly monitored.
- Contaminant concentrations indicate that there may be two source locations. Current isoconcentration contours depict the UST area as the most likely source. Since the trench system likely drains back to the tank area it is not possible to conclude that the tanks themselves are a source of a recent release. 1988 concentrations depict one of the fueling islands as a likely source area.
- MTBE concentration trends indicate that a gasoline release has occurred since the current UST system was installed in 1988.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: single wall FRP (1 Regular @ 12,000, 1 Premium @ 10,000, 1 Plus unleaded @ 6,000, 1 DW FRP waste oil @ 1,000) installed in 1/1/83
Piping: Fibertrench installed 1/1/83
Dispenser Containment: no, currently installing
Sump: yes, part of the fiber trench system
Spill: yes
Overfill: no
Striker Plate: unknown, type unknown
Vapor Recovery: Vaporvac

Compliance Monitoring:

- The tank is monitored with an ATG, Veeder Root TLS-250
- The piping is listed as a lined trench and seems to be monitored as a double wall system. The monitoring for the secondary space, the trench, is listed as Red Jacket PPM 2000 which is not in the LG113. A MLLD Red Jacket XLD monitors the primary piping. The system is said to have auto shutdown. Since this is a double wall system it needs to be monitored as such and need sensors in the trenches. The notes from the file indicate that it may have sump sensors. There appears to be an on going problem with water in the piping trenches at this site. There are records of numerous sightings for water in the trenches and sensors that are not working.
- There is a URF on file for a structural failure of the waste oil tank on 3/31/89. The files indicate that there was a waste oil tank removed on 12/8/88.
- Water in sumps and in alarm on 7/7/95.
- Piping tightness test was done 6/12//95 by Tanknology and passed
- Based on Local Agency records, Red Jacket leak detectors failed in 1994 and 1995. The site has also been found to be in alarm on several inspections. The alarm condition was presumably due to water infiltration in sumps and lined trenches.

Site Visit on 9/18/98

- When the team arrived the station was in the process of making upgrades that were not required under the 1998 deadline. This made it difficult to assess the system.
- Turbine sumps and dispenser pans, separate from the trench system, were being installed.
- The tank top fittings were corroded. This follows when considering there is a water intrusion problem at the site.
- No evidence of monitoring for the trench system was found during the inspection.

Site Investigation:

- Site investigation appears to have begun at this site due to the removal of a waste oil tank in late 1988. An URF was issued for the waste oil tank on 6/16/89. A gasoline release has never been reported.
- In March 1989 a soil vapor survey was conducted. The contractor determined that the isoconcentration contours depicted two release areas: north of the westerly pump island (upgradient of RW-1) and between the tank and eastern pump islands (upgradient of MW-1).
- Three groundwater monitoring wells were installed in January 1990. Up to 10 ppb benzene was detected in groundwater during the first sample event. However, free product was detected in MW-1 in August 1992. TPHG and benzene concentrations in the source area wells continue to be elevated.
- The first MTBE analyses were conducted in November 1993. 10,000 ppb MTBE was detected in RW-1.
- Records indicate that regular testing for MTBE began on 5/23/95 with MTBE present in MW1, 2, 3, 4, 6 & 7 and RW1 up to 20,000 ppb in MW-1.
- The highest and current level of MTBE is on 8/8/97 of 120,000 ppb in RW1 (dispenser island area).

High BTEX and TPH levels are also present in the well.
- The ground water flow is to the NW at a gradient of 0.0100 on 11/24/97.

Action:
None at this time

Conclusion:
- This site appeared to meet the 1998 deadline standards except for the overfill device. The current upgrade of dispenser containment is not required under the 1998 deadline
- The team had no means of evaluating the tanks at this site.
- It is difficult to determine if the trenches or the rest of the UST system were being properly monitored.
- The facility has had repeated problems with monitoring equipment and water intrusion into sumps and trenches. This is be an installation, monitoring, and an enforcement issue.
- Based on contaminant trends and inspection records it appears that a gasoline release has occurred from the system in use from 1983 to 1998 and was not detected or reported.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall FRP (1@ 10,000, 2@ 8,000, 1@ 1,000) installed in 1/1/96
Piping: Double wall FRP installed 1/1/96
Dispenser Containment: yes
Sump: yes
Spill: yes
Overfill: yes
Striker Plate: unknown
Vapor Recovery: type unknown

Compliance Monitoring:

- The tank is monitored with a Veeder Root TLS-350
- Piping tightness test was done 12/1/97 by Triangle Environmental and passed

Site Visit on 9/17/98

- This site appeared to be a model site with all of the 1998 required upgrades in place. The following observations were made during the site visit:
- An active dispenser leak that was being captured by the dispenser pan was discovered during the visit.
- The power light on the TLS was burned out. It was replaced during the inspection.

Site Investigation:

- Tanks replaced in July 1985, free product observed in tank pit.
- Seven monitoring wells were installed between 1986 and 1989.
- Groundwater monitoring began in 1986. Between 25,000 ppb and 50,000 ppb TPHG and 4200 to 13,000 ppb benzene were detected in MW-1, 2 and 3. Benzene concentrations have reduced significantly since then. However, TPHG concentrations remain within historic ranges in MW-2 and MW-3.
- MTBE analyses began in 1993 in most wells. The highest concentration detected in 1993 was 23,000 ppb in MW-3. Concentrations in this well have remained within historic ranges. MW-1 has contained less than 1000 ppb except for one event. Concentrations in MW-2 increased by an order magnitude from 1993 (3600 ppb) to 1995 (20,000 ppb) to a high of 24,000 ppb in 1996. The highest concentration of MTBE detected at the site was 54,000 ppb in MW-6 in November 1995. Concentrations of MTBE in MW-6 remained above 10,000 until the last monitoring event in July 1998 when a low of 150 ppb was detected.
- URF filed on 2/5/96 during the removal of piping the contamination was found.

Action:

None at this time

Conclusion:

- The current system meets the 1998 upgrade requirements.
- The team had no means of evaluating the tanks at this site.
- The site inspection revealed a dispenser leak that was captured by the dispenser containment. However, it is unclear whether the dispenser was being properly monitored or if the leak was detected by the monitoring system prior to the inspection.
- There is no evidence of a release to the environment from the current system. There is evidence that a

release occurred from the previous piping system. It is likely that the release was stopped when the piping was replaced in 1996.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall, FRP (3@ 10,000) Xerxes installed in 12/1/95
Piping: Double wall, FRP, A o Smith
Dispenser Containment: Yes, Brovo Box
Sump: yes, fiberglass and
Spill: yes, 25 gallon fiberglass
Overfill: yes, drop tube
Striker Plate: assume yes because of the age the tank
Vapor Recovery: *type unknown*

Compliance Monitoring:

- Last tank test was done at installation
- Tank is monitored using a Veeder Root TLS 350 and appears to be functioning properly.
- Piping is monitored with a sump sensors and Red Jacket FX2V

Site Visit on 9/18/98

- The facility is very well maintained.
- The sumps were well constructed and appear to drain well around the collar into the backfill with no liquid present in the sumps.
- The dispenser pans are all dry and there is no evidence of leaking.

Site Investigation:

- Four monitoring wells were installed in 1995 as part of a site assessment
- URF was filed on 1/23/96 when contamination was detected during tank replacement. Up to 3800 ppm TPHG was detected in soil.
- The highest concentrations detected in groundwater in 1995 were 80,000 ppb TPHG and 6900 ppb benzene in MW-2 (destroyed '95). TPHG concentrations in wells MW-3, MW-4 and MW-5 have remained around 1000 ppb or less except at MW-5 and benzene has been below 100 ppb except at MW-5 during 3 events. TPHG and benzene concentrations are generally declining.
- MTBE analyses have been conducted since the monitoring wells were installed. The highest concentration was detected in MW-2 at 21,000 ppb. MTBE concentrations in MW-3 and MW-4 have fluctuated, but have remained within historic ranges except for a recent decline which was most significant in MW-4. MTBE concentrations were also declining in MW-5 until the most recent event. A verbal report indicates that concentrations in MW-5 have risen from a few hundred ppb to 18,000 ppb MTBE. In addition, 5500 ppb TAME was detected in this well during the last event. TAME was also detected at 140 ppb and 38 ppb in MW-3 and MW-4 respectively.

Action:

None at this time

Conclusion:

- The current system meets the 1998 upgrade requirements.
- The team had no means of evaluating the tanks at this site.
- The inspection did not reveal any evidence of a current or recent release from the current 1998 compliant system.
- Until the most recent monitoring event it appeared that the release from the previous UST system (last operated by Exxon) was the source of MTBE, since most wells showed declining concentrations of most contaminants. However, due to the sudden spike of MTBE and the high detection of TAME (A

Chevron exclusive product) it appears that a release has occurred since the new system was installed.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel FRP clad (1@ 12,000, 1 @ 7,000, 1 @5,000) Modern Welding stalled in 3/31/97.
Piping: Double wall flex (Enviroflex) installed 3/31/97
Dispenser Containment: *unknown, type unknown*
Sump: yes, *type unknown*
Spill: yes, *type unknown*
Overfill: yes, *type unknown*
Striker Plate: yes
Vapor Recovery: Stage I - Dual, Stage II - Balanced

Compliance Monitoring:

- The tank is monitored with an interstitial sensor and EBW Autostick II
- There are no records of a tank test for the new system.

Site Visit on 9/16/98

- This site appeared to be a model site with all of the required 1998 upgrades in place. The following observations were made during the site visit:
- A 60% LEL was noted in the unleaded annular, while a 20% LEL was noted in the split tank annular.
- No other problems were noted with any of the other components inspected during our visit.

Site Investigation:

- There is a URF for a release discovered on 7/20/83 due to contamination detected during installation of ten groundwater monitoring wells and was attributed to structural failure of a tank.
- Free product was measured periodically beginning in 1983.
- In 1994 a soil vapor and free product removal system was operated
- In May 1996 the USTs, piping and dispensers were removed. Over 1000 cubic yards of soil was over-excavated. Up to 5.8 ppm MTBE was detected in the verification soil samples.
- Monitoring for MTBE began in some wells in October 1996. 4000 ppb MTBE was detected in one well (B-7). Since then, two quarters of MTBE sampling has been conducted for most wells. The site has a high MTBE level of 29,000 ppb in MW5 on 8/14/97, method 8240 used for analysis. No sample results have been provided since. Analytical data from 1993 to present indicates that benzene levels continue to be high in many wells.

Action:

None at this time

Conclusion:

- The current system meets the 1998 upgrade requirements
- The team had no means of evaluating the tanks at this site.
- There was no evidence discovered during the inspection that a release to the environment from the current system has occurred. However, high LEL levels were observed in the interstitial space of the tanks. The cause of these high LEL levels is unknown.

It is likely that the MTBE contamination is a result from a release from the previous system.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall, wet wall, FRP (3@ 10,000) Owens Corning installed in 1985
Piping: Double wall system, fiber trench installed in 1985
Dispenser Containment: none (unless the trench system was extended to include the dispenser area) although the site is scheduled to have dispensers installed in October.
Sump: yes but not attached to the tank (dirt, water, and product in sight), corrugated metal drainpipe
Spill: yes, 5 gallon metal not cathodically protected
Overfill: Yes, drop tube
Striker Plate: assume yes because of the age the tank
Vapor Recovery: Balance

Compliance Monitoring:

- The piping is being monitored with sensors placed along the trench and a Veeder Root WPLLD on the FRP.
- The tank is wet wall with the old Ping-Pong balls that will need to be replaced.
- Piping tightness test was done 4/2/98 by NDE and passed

Site Visit on 9/18/98

- There is a fiber trench system at this site and therefore many unknowns when it comes to determining the status of the system. It is impossible to tell from a visual inspection of the sump if the trench is fiberglassed to the outside of the sump. Likewise, it is impossible to tell how far under the dispenser the trench extends. Most facilities and local agencies do not have as built plans available for inspection.
- At this facility the sump is made of a metal corrugated drainpipe and the trench is most likely not fiberglassed to it. Although the system could be engineered to drain to another point it is impossible to tell at this time. The trench is monitored with float sensors and the site has had ongoing problems with water getting in to the trench system.
- From observation this system meets the requirements for an upgraded system except that the spill buckets and sumps are not cathodically protected. Even so, the site is experiencing an ongoing leak from the system.
- One location where the system was leaking, at the time of our site visit, was the piping under a dispenser. The piping was wet and the gravel underneath is visibly stained. If this is a truly a secondarily contained system the leak should have been detected by the trench sensors.
- The owner of the station, Equilon, intends to abandon their trench system because of problems experienced due to infiltration of water.
- Due to the use of a Veeder Root Simplicity Communication System in use at the site it was impossible to check alarm history, only inventory was available at the time.

Site Investigation:

- Spill Report Form filed on 2/12/86 based on soil contamination detected at the time of tank removal.
- URF was filed for a release on 10/2/86. The cause of the leak was a structural failure. The tanks were reportedly installed on 1/1/86.
- A groundwater monitoring well (MW-1) appears to have been installed in 1985 or 1986. Two groundwater-monitoring wells were also installed in 1989. However, groundwater-monitoring records don't begin until the first quarter of 1990.
- TPHG concentrations were below 1000 ppb until 1993, when they increase to concentrations in excess of 10,000 ppb in MW-1. The highest concentration of TPHG was detected in 1996 at 78,000 ppb. While there appears to be some correlation between TPHG (and benzene) concentrations and groundwater elevations, one of the lowest concentrations detected (1992) was from the same

groundwater elevation as that of the highest concentration detected in 1996.
- MTBE testing began on 7/17/96 with 48,000 ppb of MTBE present in MW1. The highest and current level of MTBE is on 4/6/98 of 280,000 ppb in GW.
- The results of a soil and water investigation performed in April 1998 indicate that the soil down gradient of the UST system contained MTBE and very little TPHG or benzene. The highest concentration of TPHG and benzene in groundwater were detected upgradient of the tanks, but down-gradient of the dispensers. The consultant has suggested that based the results of the investigation there appears to be two separate releases.
- The ground water flow is to the NW at a gradient of 0.0090.
- Depth to water is 7.1 feet minimum, 17.91 feet maximum, and currently 7.68 feet. However, groundwater elevations in MW-1 have not exceeded 5 feet of change in over 7 years of gauging.

Action:
None at this time

Conclusion:
- On paper, the site meets the 1998 upgrade requirements.
- The team had no means of evaluating the tanks at this site.
- Under the current regulations, this facility is not required to have dispenser containment and it is not known if the trench is protecting this area.
- It appears from the site inspection and investigation results that there has been a release from the nominally 1998 compliant UST system. The dispenser piping may be one of the release sources. However, the release was not apparently detected by the monitoring system.
- The recent or ongoing leak at the station indicates one of three possibilities: 1) the trench does not extend underneath the dispenser area; 2) the trench does extend under the area but is not product tight and the gasoline is escaping into the environment, or 3) the trench does extend underneath the area but the leak is not large enough to be picked up by the leak detection equipment.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel clad (2@ 12,000, 1@ 520) Modern Welding installed in 1/2/90
Piping: Fiber trench system installed 1990
Dispenser Containment: none
Sump: yes, fiberglass
Spill: yes, steel but not in contact with the backfill.
Overfill: yes, drop tube
Striker Plate: A reference indicates that Modern Welding did not install striker plates in their tanks until 8/90. Apparently this tank was not manufactured with one and may need to have one installed to meet the upgrade requirements.
Vapor Recovery: type unknown

Compliance Monitoring:

- The tank is monitored with a Universal Sensor Devices, Inc. LA-08 Piping tightness test was done 4/26/96
- This site has fiber trench and seems to be monitored as a double wall system with a sump sensor and mechanical line leak detectors (Vaporless LD2000).
- The monitoring system at this site is not functional.
- There is no emergency shut off.

Site Visit (9/18/98)

- According to the local agency, the facility had not been operating since 1996. When the team arrived, the station appeared to be reopened although the operator/owner had not contacted the local agency to do so. It also appears as if work has been done at this site although the local agency had not been notified. This would mean that the repairs or upgrades have not been verified or inspected by the local agency.
- There is a fiber trench system at this site and therefore many unknowns when it comes to determining the status of the system. It is impossible to tell from a visual inspection of the sump if the trench is fiberglassed to the outside of the sump. Likewise, it is impossible to tell how far under the dispenser the trench extends. Most facilities and local agencies do not have as built plans available for inspection.

The following are the observations from the site visit:

- In the regular sump:
    - There was no cap on the sump.
    - It was impossible to tell whether the trench terminated in the sump. The penetrations were sealed so it is assumed that the intention is not to have the trench drain into the sump.
    - The sump sensor was not functioning.
- In the super sump:
    - The sump is not sealed at the penetrations and very clean looking pea gravel is in the bottom of the sump. It looked is if work had recently been done on the sump.
    - Again it was impossible to verify that the trench was connected to the sump where monitoring would take place.
- The dispenser area was a source of concern. The piping was leaking above the shear valve and there are oil filters sitting upside down in the backfill.
- The team was unable to verify how far the trench system extended and if the dispenser area was protected

Site Investigation:

- URF was filed for a release on 2/6/85. The cause of the leak was a structural failure discovered at the tank closure.(Agency records indicate that leak was discovered during pump island work and product was detected in soil).
- URF filed 3/7/90. Filed based on contamination discovered at time of tank removal. In addition, 50 gallons of product was spilled when a fiberglass tank ruptured upon removal. Significant concentrations of petroleum hydrocarbons were detected at 14' and 21' below ground surface (bgs) in soil. However, three soil borings drilled at the tank pit 3 months later did not detect any significant concentrations until approximately 30' bgs, indicating that an older release may have migrated through the permeable soils from 10' to 30' bgs.
- Groundwater was not encountered in borings drilled to a maximum depth of 80' bgs in 1990 or 1991. However, groundwater was encountered in 1992. Grab groundwater samples were collected during drilling and contained up to 29,000 ppb TPHG and 1100 ppb benzene.
- Vapor extraction wells were installed in 1994. Groundwater samples were collected from these wells and contained up to 69,000 ppb TPHG and 13,000 ppb benzene.
- Regular monitoring of the wells did not begin until 1997 and is being conducted semiannually. TPHG and benzene concentrations remain high in the source area wells. BTEX and TPHG were all high during the 4/18/97 and 9/19/97 reports. The highest TPH was 100,000 ppb on 9/19/97 but is currently 81,000 ppb. The highest Benzene was 13,000 ppb on 7/17/94 but is currently 9,600 ppb.
- MTBE was first detected, but not quantified, in well PMW4 in November 1995. MTBE concentrations in VE2 increased by an order of magnitude between September 1997 and March 1998 sampling events. The highest and current level of MTBE is 73,000 ppb detected on 6/1/98 in VE-2. The MTBE concentrations in the other source area well (VE-1) have remained above 30,000 ppb since April 1997. Increasing concentrations are also being observed in PMW-4 near the dispensers.
- Depth to water is 33.91 feet minimum, 38.2 feet maximum, and currently 33.96 feet.
- A report suggests that there does not appear to be a correlation between ground water levels and MTBE concentrations, however, there are relatively fewer MTBE analyses than ground water monitoring data.
- A source area investigation was performed in October 1998. The only soil contamination detected above a depth of 30 feet was located approximately 30 feet from the dispensers and USTs. A site plan depicting the product line locations was not available. It is possible that this soil sample location is near a bend in a product line. However, significant contamination was not detected.

Action:

None at this time

Conclusion:

- This site meets the 1998 deadline standards
- It is difficult to determine if the trenches or the rest of the UST system are being properly monitored.
- Water in the secondary containment is a problem in the turbine sumps. Because of the water intrusion the monitoring devices were altered, pulled up so they did not come in contact with the liquid. This is an enforcement issue as well as an installation issue.
- There was a leak observed in the dispenser. It is difficult to determine whether dispenser pans are present to capture and detect a release.
- Based on site observations there is potential for releases to go undetected. However, based on the recent soil investigation, there is no evidence of a ongoing or recent release from the current compliant UST system.
- The source of increasing MTBE concentrations in groundwater appears to be from trapped residual contamination in soil at 30 to 35 feet, probably from a release from the previous UST system.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall steel FRP clad (1@ 12,000, 2@ 10,000, 1@ 520) Modern Welding stalled in 1/1/87
Piping: Double wall FRP installed 1994 (replaced the fibertrench)
Dispenser Containment: *unknown, type unknown*
Sump: yes, *type unknown*
Spill: yes, *type unknown*
Overfill: yes, *type unknown*
Striker Plate: yes
Vapor Recovery: Stage I - Dual, Stage II - Balanced

Compliance Monitoring:

- The tank is monitored with a Veeder Root TLS-350. The TLS-350 did not have a printer so none of the monitoring history for the site could be determined
- Maintenance equipment check was done 9/10/96 by Triangle Environmental and passed interstitial sensors, vapor recovery, and MLLD.

Site Visit on 9/16/9

This site appeared to be a model station with all of the 1998 required upgrades in place. The following observations were made during the site visit:

- There was liquid, presumably water, in both of the gasoline STP sumps that had been left from failed lake tests performed on both sumps the previous week by an outside contractor.
- The sump probes had been raised up to keep them out of alarm and were still in that position during our inspection.
- 10% LEL reading in the diesel annular. The cover for the super annular was frozen and could not be removed for testing purposes.

Site Investigation:

1987 - piping replaced with fiber line trenches - no release detected
1987 - 1 double walled tank installed (premium)
1990 - 2 tanks replaced with double walled tanks- up to 0.13 ppb benzene in soil beneath former tanks.
1991 - case closed
1994 - piping replaced with double walled/ No soil samples per LA

- URF filed on 1/20/98 as a result of subsurface investigation conducted in response to detection of MTBE in a nearby municipal supply well. New case opened.
- High MTBE concentration 140,000 ppb in February 1998 at MW-6 at the north end of the tank pit. Concentrations have declined to 11,000 ppb in August 1998 at MW-6. The monitoring well is now connected to remediation system and is no longer monitored. MTBE concentrations in MW-5 on the south end of the tank pit have increased from 20,000 ppb in March 1998 to 120,000 ppb in August 1998. This well was also connected to the remediation system. Some benzene and TPHG have been detected in these wells, up to 610 ppb and 740 ppb, respectively. Most other wells have MTBE only contamination.
- Significant concentrations of MTBE were also detected in soil (up to 100 ppm) around the tank pit in 1998 and little to no TPHG or BTEX.
- A soil vapor extraction system was started in May 1998 and may be assisting in lowering concentrations in some of the wells. Over 1500 lbs of MTBE as vapor have been removed. In addition, a groundwater extraction system has also been started at the site.

Action:

None at this time

Conclusion:

- The current system meets the 1998 upgrade requirements.
- The team had no means of evaluating the tanks at this site.
- Water in the secondary containment is a problem in the turbine sumps. Because of the water intrusion the monitoring devices were altered, pulled up so they did not come in contact with the liquid. This is an enforcement issue as well as an installation issue.
- There was no evidence of a current or recent release at the time of inspection. However, it appears that the sumps may not be liquid tight.
- Based on the system upgrade history and investigation results it appears that a release from the upgrade compliant system has occurred and gone undetected. It is possible that the release occurred while the fibertrench system was in use. However, the significant amount of MTBE removed by the remediation system indicates that a more recent release may have occurred.

Lead Agency: City of San Jose Fire Dept.
SCVWD

Site Address: San Jose, CA

Existing UST System Components:

System type: Pressure
Tanks: Double wall, FRP clad steel (2@ 12,000) Modern Welding installed in 12/1/89
Piping: Double wall FRP installed on 12/1/89, *type unknown*
Dispenser Containment: *unknown, type unknown*
Sump: yes, *type unknown*
Spill: yes, *type unknown*
Overfill: Yes, *type unknown*
Striker Plate: *unknown*
Vapor Recovery: *type unknown*

Compliance Monitoring:

- DW system is monitored with a Veeder Root TLS-350
- Piping is also equipped with a Red Jacket MLLD.
- System has auto shutdown (not *confirmed).*
- Piping tightness test was done 1/8/98 by Triangle Environmental, Inc. and passed.

Site Visit on 9/17/98

- This site appeared to be a model site with all of the 1998 required upgrades in place. The following observations were made during the site visit:
- The LEL of both annular spaces was well over the 100% level.
- There was liquid in the super STP sump and the probe had been raised up above the height of the liquid.
- The power light on the TLS was burned out. We replaced it during the inspection

Site Investigation:

- URF was filed for a release on 12/4/89. The cause of the leak was a structural failure and this was discovered at the time of removal of the old tanks.
- Three groundwater monitoring wells were installed in July 1990. Three additional wells were installed in December 1990. In 1992, the last three 2 wells were installed.
- Groundwater monitoring records begin in the third quarter of 1990.
- TPHG and benzene concentrations increased significantly within the first few sampling events. By June of 1992, TPHG concentrations had increased to 51,000 ppb and benzene up to 6600 ppb in MW-2 near the tank field. The source area wells depict steady TPH concentrations over time. Slightly increasing trend is seen with benzene concentrations in the two source wells (MW-2 and MW-3).
- MTBE testing began in April 1996 with MTBE present in MW1, 2, 3, 4, 5, & 6. (The laboratory noted the presence of MTBE as early as September 1995, but it was not quantified). Up to 290 ppb was detected when MTBE testing began in April 1996. Within two quarters, MTBE concentrations near the tank increased to 33,000 ppb. MTBE concentrations in the other wells have remained below 1000 ppb.
- The highest and current level of MTBE is on 6/30/98 of 75,000 ppb in MW3 (tank pit area), 8260 was used to confirm. Elevated concentrations of BTEX and TPH are present and within historic ranges.
- The ground water flow is to the south at a gradient of 0.002. The groundwater gradient has been primarily south to southwest. The groundwater elevations in MW-3 have risen 10 feet since groundwater monitoring began. However, there are no observed correlation between depth to water and concentrations except for MTBE concentrations in MW-6 appear to be inversely related. In addition, an inverse correlation can also be observed between elevations in MW2 and MW-5 relative to TPH concentrations.

Action:

None at this time

Conclusion:

- The site meets the 1998 upgrade requirements.
- The inspection results (high LEL and liquid in sumps) indicate the system may not be operating as designed.
- The team had no means of evaluating the tanks at this site.
- Water in the secondary containment is a problem in the turbine sumps. Because of the water intrusion the monitoring devices were altered, pulled up so they did not come in contact with the liquid. This is an enforcement issue as well as an installation issue.
- The subsurface monitoring data indicates that residual contamination from the release reported in 1989 has not been removed, resulting in continued high TPHG concentrations. The increases in MTBE concentrations would indicate that a more recent release from the upgrade compliant system has also occurred.

Appendix II

Site Information