**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION IX**
**75 Hawthorne Street**
**San Francisco, CA 94105**

WASTE MANAGEMENT DIVISION
RCRA ENFORCEMENT OFFICE

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| Purpose: | RCRA Investigation |
| Facility: | Chemical Waste Management, Inc. |
| Facility Address: | 35251 Old Skyline Road<br>Kettleman City, CA 93239 |
| EPA ID Number | CAT 000 646 117 |
| Dates of Investigation: | February 8-12, 2010<br>March 1-2, 2010<br>April 15, 2010 |
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| Report Prepared By: | EPA Representatives listed above |
| Date of Report: | February 24, 2011 |

**INVESTIGATION:**

On February 8-12, 2010, a Resource Conservation and Recovery Act (RCRA) Investigation was conducted by inspectors from the United States Environmental Protection Agency (EPA), accompanied by representatives from the Department of Toxic Substances Control (DTSC). The purpose of the investigation was to determine the compliance of Chemical Waste Management, Inc. (CWM) at the Kettleman Hills Facility (herein "CWM-KHF", "WM-KHF" or "the facility") with hazardous waste (HW) regulations in 40 Code of Federal Regulations (CFR) Subtitle C, Parts 261-265, 266, 268, 273, and 279, the regulations adopted by the California authorized program under RCRA Subtitle C in the California Code of Regulations, Title 22, Division 4.5, and the facility's Hazardous Waste Permit (Permit Number 02-SAC-03).

On March 1-2, 2010, a sampling event was conducted at the facility by representatives of DTSC, accompanied by EPA representatives Kandice Bellamy and Jennifer Downey. Samples from surface impoundment P-16 and its riser and the primary riser from landfill B-18 phase 1B were collected for analysis by DTSC's in-house and contract laboratories. The analytical results of these samples tested by the DTSC in-house or contract laboratories are included in this investigation report as Attachment #18. A table summarizing the results from the March 1-2, 2010 sampling event is included in this investigation report as Attachment #19.

On April 15, 2010, EPA representatives Joseph Eidelberg and Jennifer Downey conducted a follow-up investigation of the laboratory at the CWM facility. The EPA representatives brought "performance testing" samples, and observed the practices and procedures used by the laboratory.

On June 4, 2010, EPA sent the facility a request for information pursuant to Section 3007(a) of RCRA (see Attachment #22). EPA requested information about surface impoundment wastes, lab records for certain split samples, and how CWM manages leachate at the facility. A copy of the facility's response, dated July 26, 2010, is included in this investigation report as Attachment #23.

On July 23, 2010, EPA sent the facility a second request for information (see Attachment #21). EPA requested laboratory records and records of excavations or extractions of landfill wastes. CWM provided responsive information on August 6, 2010, September 3, 2010, October 1, 19, and 25, 2010, and November 5 and 11, 2010.

Concurrently, a Toxic Substances Control Act (TSCA) investigation was conducted by inspectors from the EPA. The purpose of that investigation was to determine the compliance of CWM with the TSCA polychlorinated biphenyls ("PCBs") requirements. Details of the PCB investigation are covered in a separate investigation report.

On November 12, 2010, the U.S. EPA Office of Enforcement and Compliance Assurance, Air Enforcement Division (AED) and EPA Region 9 conducted an unannounced air monitoring inspection at the CWM facility to determine if the facility emits significant concentrations of volatile organic compounds (VOCs), including benzene. The report from this inspection will be issued as a separate document.

**BACKGROUND:**

The CWM facility, located on 1,600 acres, is a commercial hazardous waste treatment, storage, and disposal facility. The facility has a DTSC issued Hazardous Waste Permit (Permit Number 02-SAC-03) (the "Permit") to accept various solid, semi-solid, and liquid hazardous wastes. Municipal and solid wastes can also be accepted at the facility into a converted landfill unit (B-19) under a permit issued by the California Integrated Waste management Board.

The hazardous waste related activities currently conducted at CWM include:

- solar evaporation in three surface impoundments (P-9, P-13 and P-16);
- disposal into a hazardous waste landfill (B-18);
- stabilization and solidification (Final Stabilization Unit - FSU);
- storage of bulk wastes (Bulk Storage Unit - BSU 1 and 2);
- storage of containerized wastes (Drum Storage Unit - DSU); and,
- Polychlorinated biphenyls (PCB) draining, flushing, storage, and disposal.

The most recent inspection of the facility was conducted by DTSC on September 15-16, 2009 (see Attachment #1). No potential violations were identified during that inspection. Attachment #1 also includes detailed information on the facility's inspection and enforcement history. Additional detailed information on the facility's processes is contained in the April 2007 investigation report of a Multimedia Compliance Investigation conducted by the National Enforcement Investigations Center (NEIC) from December 5 – 16, 2005 (see redacted version of this report, Attachment #2). A map of the facility is enclosed as Attachment #3 of this report.

Unless otherwise specified in this investigation report, Messrs. Bob Henry and Paul Turek were the sources for information that was verbally provided to the investigation team.

A log of the photographs taken during the investigation by Kaoru Morimoto on an Olympus Stylus Tough-6000 digital camera is included in this investigation report as Attachment #9. A log of the photographs taken during the investigation by Jennifer Downey and Chris Rollins on an Olympus Stylus 770SW digital camera is included in this investigation report as Attachment #11. The photographs from these logs are attached as Attachments #10 and #12, respectively.

**SITE INVESTIGATION:**

Untarping Rack

The covers on incoming loads are opened in this area. The vehicle then goes directly to the nearby Sampling Tower.

Sampling Tower


Samples from incoming loads are collected in this area.

After the samples are taken, the vehicle moves to the in-bound scale. After weighing, the vehicle waits in a nearby lot for clearance to proceed onto the facility.

Drum Storage Unit (DSU)

The inspectors walked through this area. A composite photograph of the north side of the DSU is provided below.

The inspectors were given a tour of the DSU by Messrs. Robert Fadden and Jes Juarez of the DSU area. Mr. Juarez is in charge of the DSU. The DSU is an open-air, covered, approximately 45,000 square feet storage area with nine storage cells, each with its own secondary containment sump. Each cell can accommodate up to five rows of drums. CWM's Hazardous Waste Facility Permit allows the facility to store up to 9,000 55-gallon drums (or an equivalent volume) in the area.

The containers at the DSU are managed in the following methods:

- liquids meeting requirements are sent to one of the surface impoundments;
- liquids are sent to the FSU for solidification;
- solids are sent to the FSU for stabilization and subsequent landfilling;
- wastes (solids and liquids) are shipped off-site to another facility.

The following observations and issues were identified during the inspection of the DSU:

The base of the unit consists of a concrete pad underlain by a high density polyethylene (HDPE) liner. The pad is equipped with an HDPE-lined sump. The inspectors noted some cracks in the concrete flooring and in the berm which runs along the perimeter of the DSU (see photographs below).

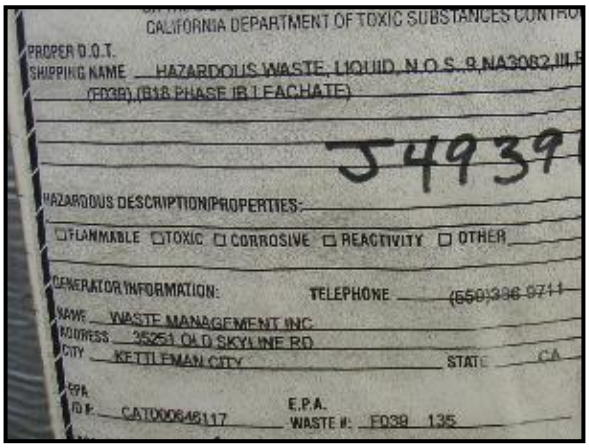
EPA's review of the DSU's as-built diagram verified that the secondary containment capacity calculations were based on the footprint of each cell and not the perimeter of the DSU where the cracks in the above photographs were observed.

EPA observed that cracks located within the secondary containment area were repaired.

*A-Cell*

In A-Cell the inspectors observed eleven 55-gallon containers of leachate (F039) collected from the hazardous waste storage tank at P-16. CWM failed to check the appropriate box for the particular hazardous properties of the waste (i.e. toxic) on the labels (see example, photograph to the right).

This issue was corrected during the investigation.



*B-Cell*

In B-Cell the inspectors noted one 55-gallon container filled with non-RCRA oily water that had an open bung (see photographs below). The facility representatives replaced the missing bung while the inspectors were there.


*C-Cell*

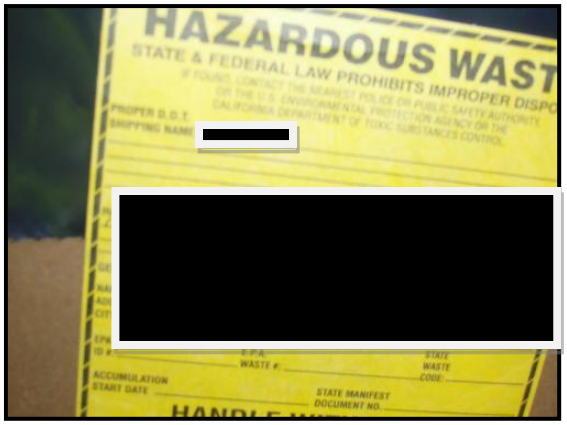
In C-Cell the inspectors noted that cardboard one-cubic card boxes were being stacked two high with a pallet underneath and between the boxes (see photograph to the right). CWM's Hazardous Waste Facility Permit allows for containers to be stacked to 72 inches in total container height, not including any pallet between the stacked containers. It appeared that the containers were right at the height limit so the inspectors cautioned CWM to ensure that none of their containers were stacked too high.

*D-Cells (Rows 1 – 5 and 5 - 10): Unloading Bay*

As waste arrives at the DSU it is brought to the D-Cell area for evaluation, testing, repackaging, and sorting.

*F-Cell*

The inspectors noted a couple of dented containers in the F-Cell area although neither appeared to be leaking. The inspectors also found two cardboard cubic yard boxes filled with used aerosol cans (see photographs below). The generator's hazardous waste labels described the contents as "flammable aerosol cans-spent (Universal Waste)". It was unclear to the inspectors whether the aerosol cans were to be shipped off as hazardous waste or universal waste. According to facility representatives, CWM accepts universal waste, repackages it (if appropriate), and then sends it off to Veolia Environmental Services for recycling. When the inspectors returned to the DSU the following day they noted that the hazardous waste label had been removed and a new label affixed that described the contents as universal waste flammable aerosol cans.




*G-Cell*

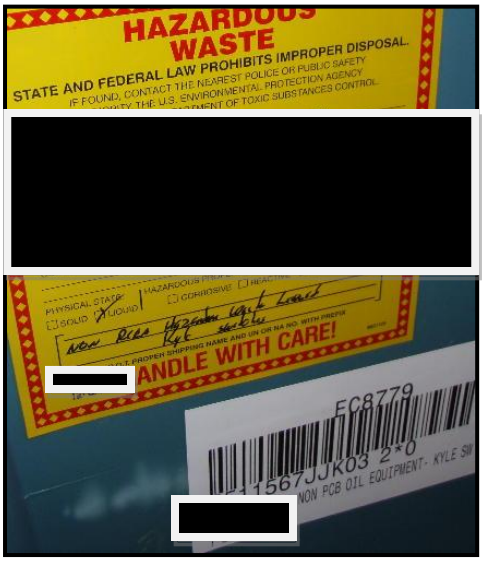
The inspectors found two containers of universal waste lamps that were left open (see photographs below). A lamp in one of the containers was broken and a small amount of liquid (rainwater which collected on the container from the recent rain) and glass were observed on the floor underneath the container (see photograph below on the right). The containers also were not marked with the words "universal waste – lamps" as required.

When the inspectors returned to the DSU on the third day of the investigation they noted that facility representatives had cleaned up the glass from the broken lamp, and repackaged and properly labeled the universal waste lamps as can be seen in the photographs below.


The inspectors also noted an open tote container filled with miscellaneous universal waste lamps in this area. Several of the lamps were not in an enclosed container as required (see photograph below on the left). When the inspectors returned to the DSU on the third day of the investigation they noted that facility representatives had corrected the potential violation and that all lamps were fully enclosed in cardboard boxes and that the tote container had been covered with plastic (see photograph below on the right).

On the third day of the investigation, the inspectors observed two containers of universal waste lamps which were being filled, but were not labeled as required (see photograph below on the left). When the inspectors returned to the DSU the following day this issue had been resolved (see photograph below on the right).

In another row in the G-Cell area, the inspectors observed several open bulk containers of electrical equipment which were filled with non-RCRA hazardous waste oil (see photographs below). Several of the containers had liquid in the bottom and oily sheens on the equipment indicating possible equipment leaks (see photograph below on the right).




When the inspectors returned to the DSU during the week, it was observed that all of the above-referenced bulk containers were now closed (see photograph to the right).

*H-Cell*

The inspectors observed a slightly bulging 55-gallon container of acid lab waste (see photograph below on the left) as well as a couple dented drums (see photograph below on the right) in the H-Cell area. No leaks were detected.

The inspectors also observed a 55-gallon drum of non-RCRA hazardous waste (used oil) which had a small amount of yellowish liquid on the top of the drum cover (see photograph to the right). When the inspectors returned to the DSU on the third day of the investigation the facility representatives pointed out that they had cleaned up and properly disposed of the small amount of used oil liquid which had accumulated on top of the drum.

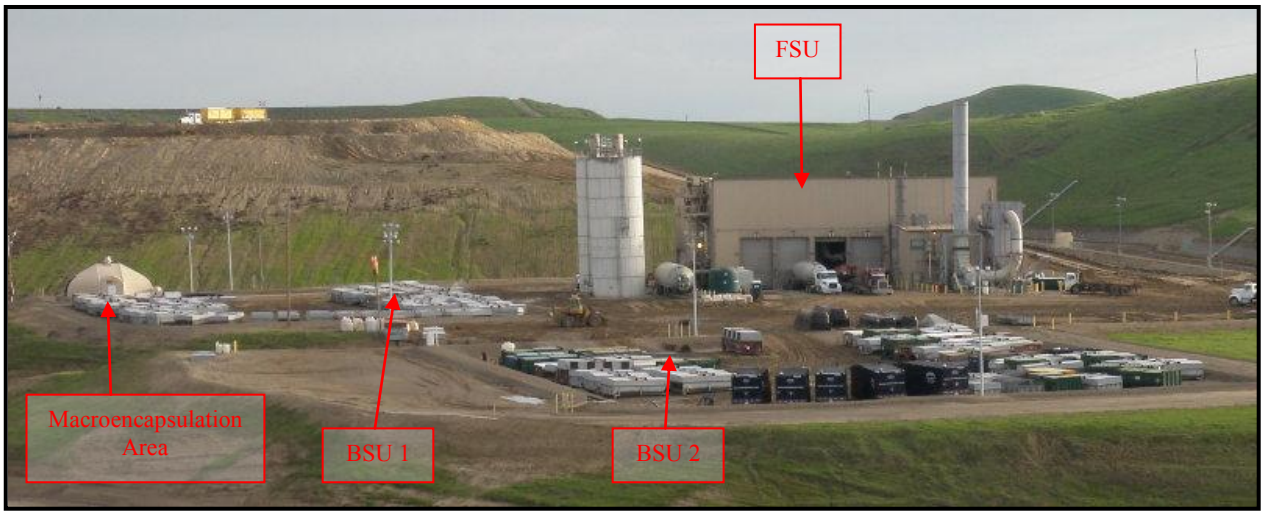
PCB Storage Building

This building is located immediately north of the DSU. Photographs of south and east sides of this building are provided below. [Note: The photograph to the below right is a composite photograph).


The inspection of and the findings from inspection of the PCB storage building and review of records and other documentation are identified in a separate TSCA investigation report.

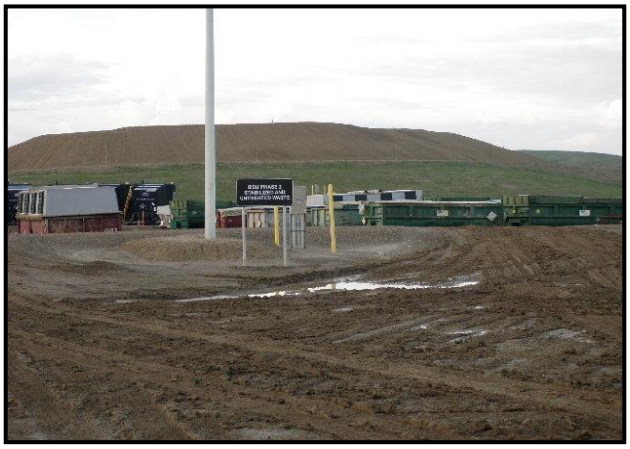
Final Stabilization Unit (FSU) and Bulk Storage Units (BSU)

The inspectors toured these areas. A cropped photograph of the overall area (facing south and taken from north of this area) is provided below.



Close-up photographs of some of these areas are provided below:

BSU Phase 1 (facing east)



BSU Phase 2 (facing north)

Macroencapsulation Area (facing east)

FSU (facing south)

As previously stated, detailed process information on the BSU and FSU are contained in the NEIC report (see Attachment #2).

In general:

- BSU#1 is used for storing treated wastes. It also contains the area where macroencapsulation containers are constructed. The storage capacity of this area is approximately 70 20-cubic yard containers.

- BSU #2 is used for storing untreated wastes which are pending "recipe" development. Additionally, treated wastes can be stored here. This area has the same storage capacity as BSU #1.

- FSU is used for processing bulk solid, semi-solid, and liquid wastes. This building contains four separate 20,000 gallon mixing tanks. The wastes and the reagents used in the treatment process are mixed with an excavator.

General Information on Analytical Procedures for wastes treated at the FSU

The following information is based on discussions with the facility representatives and information contained in the NEIC report for the 2005 investigation.

Specific procedures for the FSU are contained in the facility's Standard Division Practice (SDP) documents. Specific SDP documents exist for the other facility operations as well.

The analytical results for each waste stream are provided by the generator. The waste profile based on the analytical results is valid for two years.

A "recipe" involving the addition of various reagents (e.g., Portland cement, ferrous sulfide, sodium hypochlorite, water, etc.) is developed by the on-site laboratory for every new bulk waste stream based on its characteristics. Three shipments of every new bulk waste stream treated at the FSU is analyzed post-treatment to ensure that the treatment "recipe" is effective. The three passes do not have to occur on the first three shipments that are received and are treated. The Stabilization Treatment Evaluation (STE) is performed on 1-in-5 shipments until three passes (i.e., the treatment was effective) are obtained. The three consecutive passes must also occur with 18 months from the date of the first pass. The possible outcomes are:

- The "recipe" was effective – the three shipments from a generator (which undergo the STE) are treated, analyzed, and found to meet the universal treatment standards (UTS).

- The "recipe" for the first shipment was effective – the first shipment is treated, analyzed, and found to meet the UTS. However, for whatever reason, the same "recipe" is not effective on *either* the second or third STE of that waste stream (the treated waste is analyzed and found *not* to meet the UTS). In this event, the "recipe" is modified – the waste is retreated– until the analytical results show that the treated waste meets the UTS.

    - The "modified recipe" must be effective for the next two shipments which undergo the STE (i.e., the treated waste is analyzed and found to meet the UTS).

        - If either one of the next two shipments from the generator (which undergo the STE) is treated and the analytical results show that the UTS were not met, this process starts over again.

            - According to the facility representative, some customer waste streams never pass three consecutive times. Therefore, each shipment is always analyzed post-treatment (i.e., no set "recipe" is developed).

- The "recipe" for the first shipment was not effective – the first shipment is treated, analyzed, and found to not meet the UTS. The waste is retreated until the analytical results show that the treated waste meets the UTS. The same modified recipe must be effective for the next two STE shipments.

Once a "recipe" is determined to be effective (three shipments are treated and the analytical results show that the UTS was met) additional shipments of that waste stream will be processed in the same manner for the rest of the year (or 18 months- depending on the frequency of the shipments of that waste stream) without additional testing (other than fingerprint verification testing).

According to Mr. Cerveny, once treated, the waste is placed into lined roll-off containers. A five point composite sample is taken (four corners and the middle). The details of this procedure are contained as an attachment to the NEIC report (see Attachment #2).

For the treatment of drum composites (contents of multiple drums with similar characteristics) a new "recipe" is developed for each batch that is treated. If the analytical results show that the treatment was not effective, the waste is retreated until the analytical results show that the treated waste meets the UTS.

Surface Impoundments: Background

The surface impoundments are permitted to accept hazardous wastes (low solids and organics) which meet the UTS and to treat these wastes via solar evaporation. According to the facility representatives and the information in the NEIC, most of the liquids placed into the three surface impoundments (P-9, P-14, and P-16) come from the leachate generated by the on-site surface impoundments and hazardous waste landfills.

Shipments of liquid from generators (bulk shipments or liquids stored in containers at the DSU) which meet the requirements identified in the Permit and CWM's operating procedures are also added to the surface impoundments. CWM requires the generator to provide analytical results for their waste streams. From the results, a waste profile is developed. CWM conducts fingerprint testing once the waste arrives at the facility. Fingerprint testing includes: physical description verification, water compatibility, pH screening, flammability potential screening, cyanides screening, sulfides screening, and oxidizer screening. Additionally, CWM combines a sample of the waste with the contents of the surface impoundment to verify compatibility.

The profile for each waste stream is valid for two years. In order for a profile to be re-certified, the generator must provide new analytical results.

A sump underneath each surface impoundment collects any leachate. The sump level at each riser (one per surface impoundment) is checked on a daily basis and recorded on the daily inspection checklist. Once the level on a sump reaches an action level of 20 inches, the sump is pumped out into an above-ground open-top 90-day hazardous waste storage tank. A copy of the SDP ("Leachate Removal Procedure" – SDP Number ET-201) which covers the procedures for pumping out the leachate into the tanks is attached as Attachment #13. Each surface

impoundment has its own 90-day hazardous waste storage tank. Each tank system is equipped with:

- an external liner secondary containment system;
- sump pump (for removal of accumulated liquids including rainwater from the secondary containment system into the tank);
- high level alarm (to comply with the two-foot freeboard requirement);
- magnehelic (to measure the liquid level in the surface impoundment's sump); and,
- riser assembly (to convey the liquids from the surface impoundment's sump to the tank).

Every two years, a sample is taken from Tanks P-9 and P-14 and a full F039 analytical testing is conducted. A copy of the SDP ("Leachate Tank Sampling" – SDP Number ET-202) which covers the procedures for sampling the leachate in the tanks is attached as Attachment #14. If the results from the sampling event show that treatment standards ("TS") are met, the leachate is placed into one of the three surface impoundments. Per the Waste Analysis Plan (WAP), this profile is valid for two years. According to the facility representative, the leachate from P-16 has had historical failures for organics. CWM determined that this waste stream will be managed as an F039 which does not meet TS. Therefore, the leachate from this tank system is not tested. The leachate from P-16 has been shipped off-site for incineration since 1995.

The tanks at the surface impoundments (and also those at the landfills) are emptied out every 90 days (or less). All the liquids (meeting TS) are placed back into P-9, P-14 or P-16. Currently the leachate from P-16 (since the leachate exceeds the TS for several constituents) is sent off-site for incineration. The P-16 leachate is containerized into 55-gallon containers, stored at the DSU as F039 hazardous waste, and shipped off-site for incineration. The manifest records of these shipments since 2007 are attached to this investigation report as Attachment #8. In response to EPA's June 2010 request for information, CWM stated that leachate from the leachate collection tank at P-14, is currently being treated on-site at the FSU and disposed of on-site in the hazardous waste landfill (B18).

The following table shows the capacity of the each surface impoundment and its associated leachate collection tank.

**Capacity of Surface Impoundments [Part A] and associated F039 Tanks**

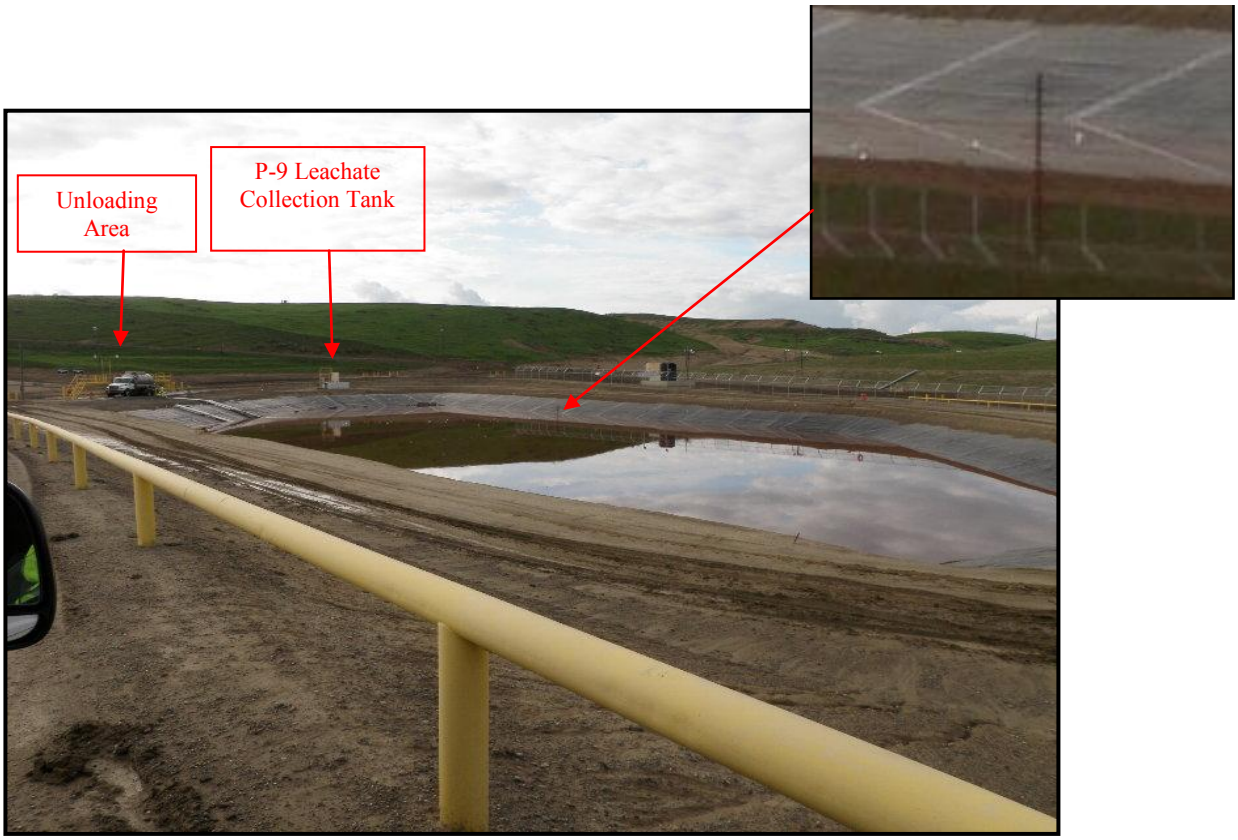
| | | | |
|---|---|---|---|
| P-9 | 4.4 million gallons | F039 Tank | 600 gallons [ 2foot freeboard] |
| P-14 | 2.1 million gallons | F039 Tank | 600 gallons " " |
| P-16 | 3.9 million gallons | F039 Tank | 600 gallons " " |

According to Mr. Turek, the closure plan specifies that the surface impoundments will be filled and closed in place.

Surface Impoundment P-9

The inspectors toured this area, which is located directly north of the FSU and BSU areas. Photographs and details of this area are provided below. Note: The inset of the level stick shows the device used to ensure that the two-foot freeboard requirement is maintained.

Pond depth liquid level stick

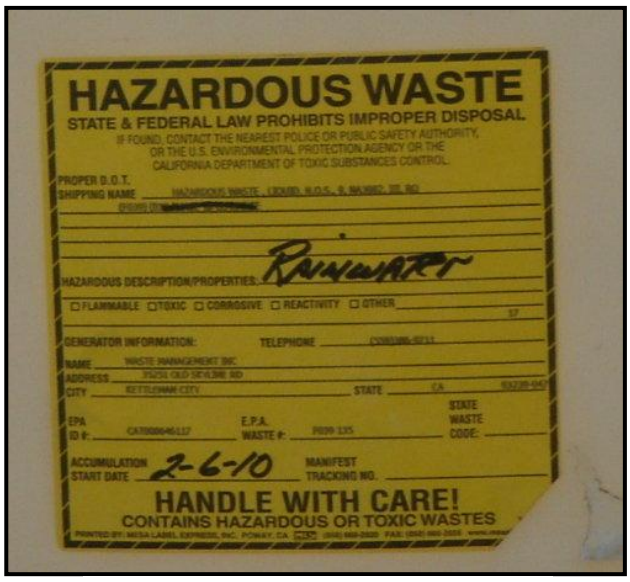



P-9 (facing north)

At the time of the investigation, the inspectors observed a vehicle in the bermed unloading pad. The driver of the truck was in the process of cleaning out the vehicle. Mr. Turek informed the inspectors that one connection (connected to a pipe leading into P-9) is used to transfer the contents of the vehicle into the surface impoundment (gravity-fed; submerged fill). Another pipe conveys the liquid which may accumulate in the unloading area into the surface impoundment (gravity-fed; submerged fill).

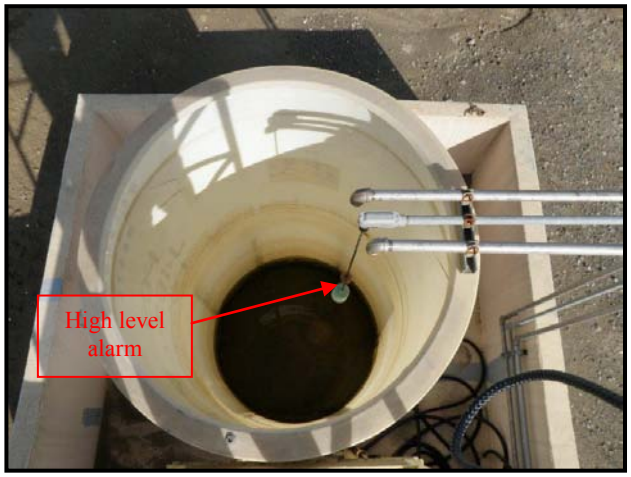

P-9 Unloading Area (facing east)

P-9: Leachate Collection Tank (facing east). Note: The panel on the right side contains the high level alarm and the magnehelic device used for determining the sump liquid level.

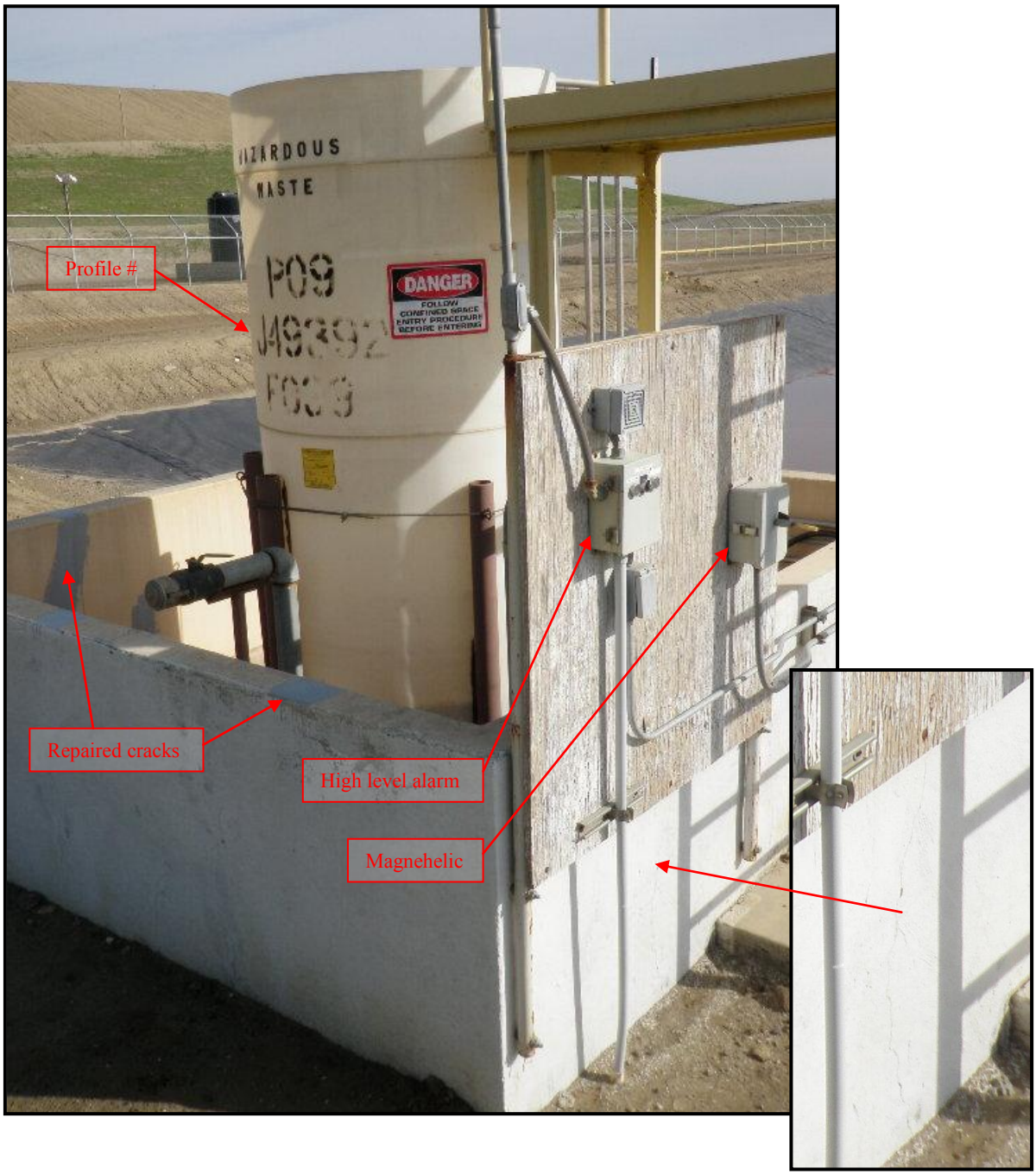



HW Label on P-9 Leachate Tank (cropped and enlarged)


P-9: Pump-out connection used to remove the contents from the 90-day hazardous waste storage tank. Note: The sump has a pump which is used to transfer any fluid which may accumulate from rainfall events into the P-9 leachate collection tank.

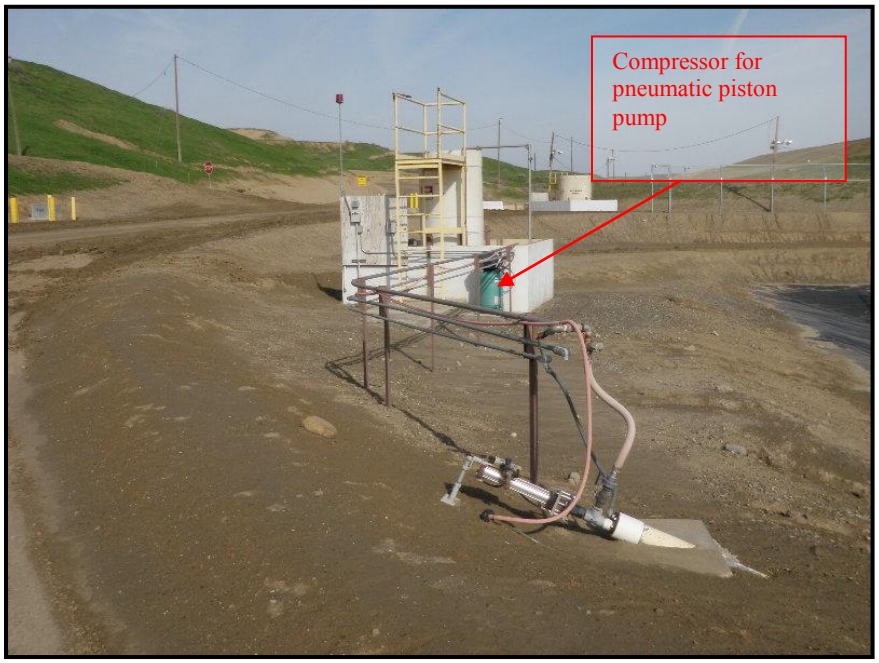



The leachate collection tank at P-9 is an open-top tank. Three pipes are located on top of the tank. One pipe is from the P-9 riser assembly, one pipe is from the P-9 tank sump, and the middle pipe is the high level alarm which ensures that the two-foot freeboard is maintained. The inspectors observed several inches of rainwater on the bottom of the tank, as described on the label.

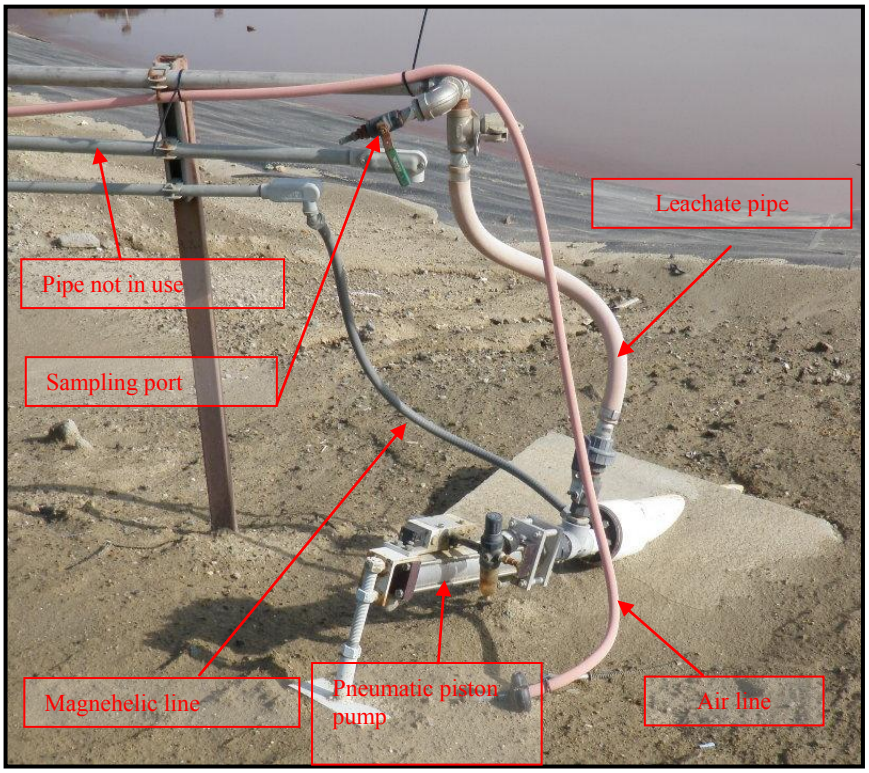



Surface impoundment P-9 is equipped with a panel containing the high level alarm and magnehelic which is used to measure the amount of liquid in the surface impoundment's sump (see photograph above – facing east)

The inspectors noted cracks on the outside wall of the secondary containment system (see cropped and enlarged inset). The inspectors also noted that the cracks on the inside walls and floor of the secondary containment system were repaired.



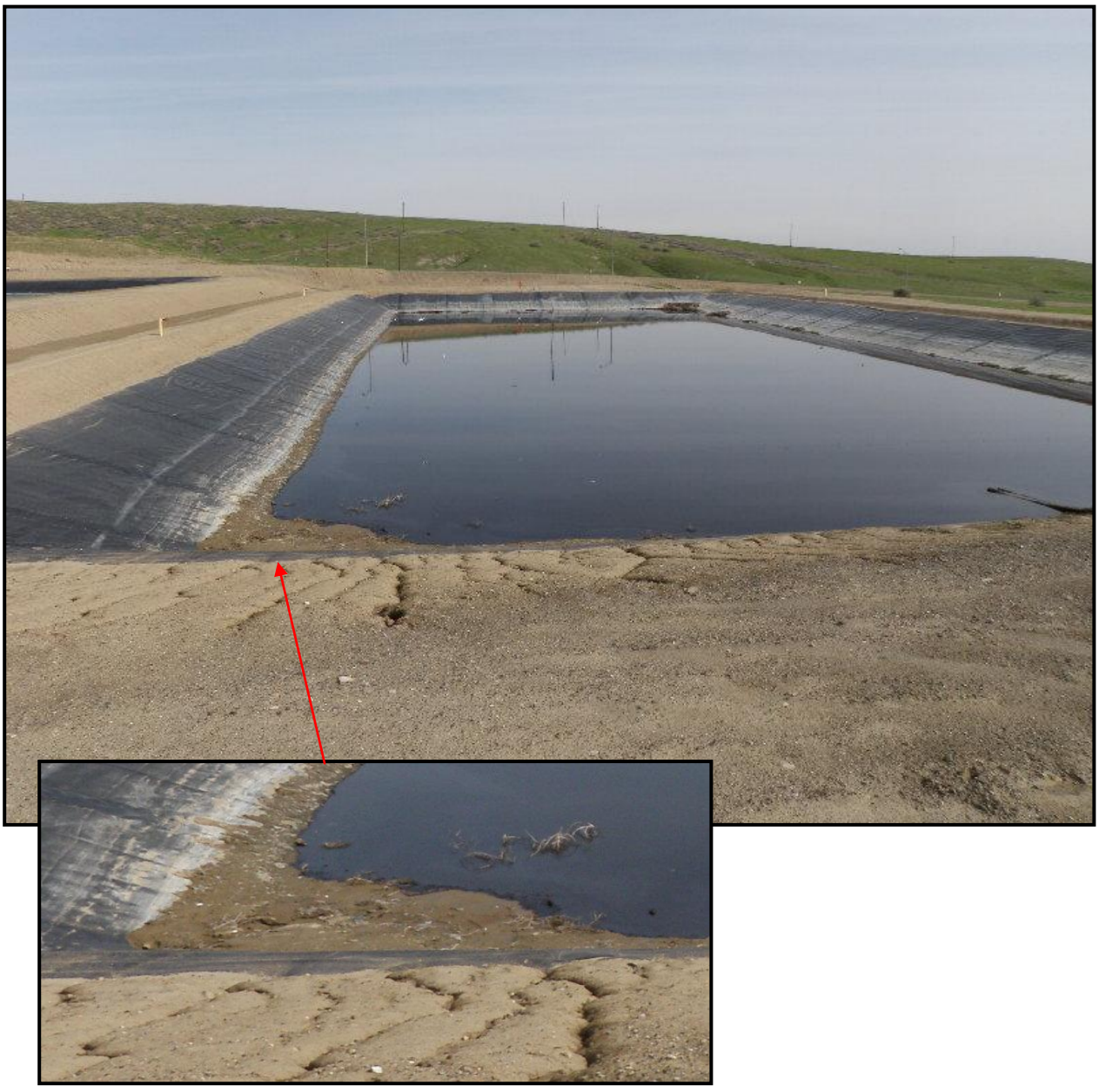

P-9: Riser assembly in the foreground leading to the leachate collection tank (facing north). A pneumatic piston pump is used to pump out the leachate sump.




Cropped photograph of the P-9 riser assembly (facing east).

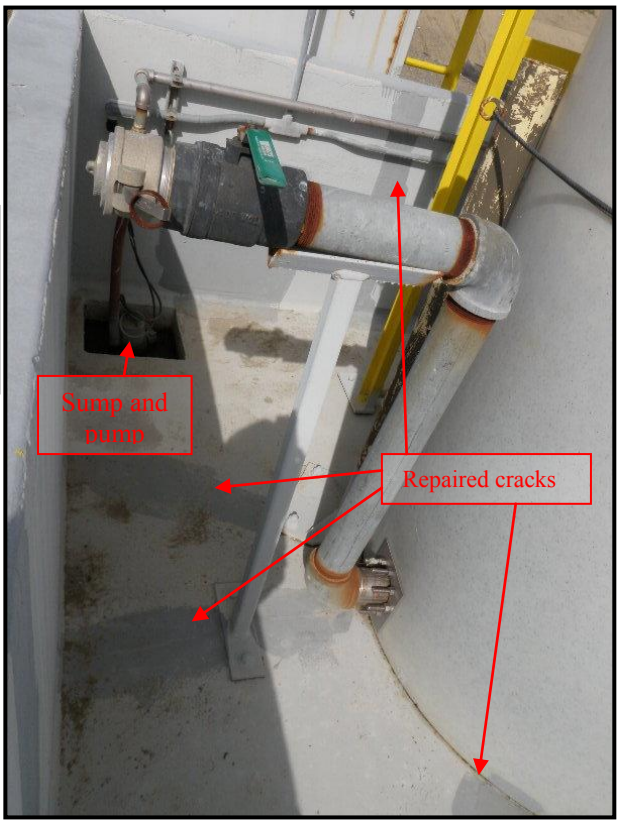
Surface Impoundment P-14

The inspectors toured this area, which is located on the northern most part of the facility. The layout of the surface impoundment and the associated equipment (i.e., riser, above-ground hazardous waste storage tank, secondary containment system, etc.) is similar to the layout of surface impoundment P-9. Photographs and details of this area are provided below.

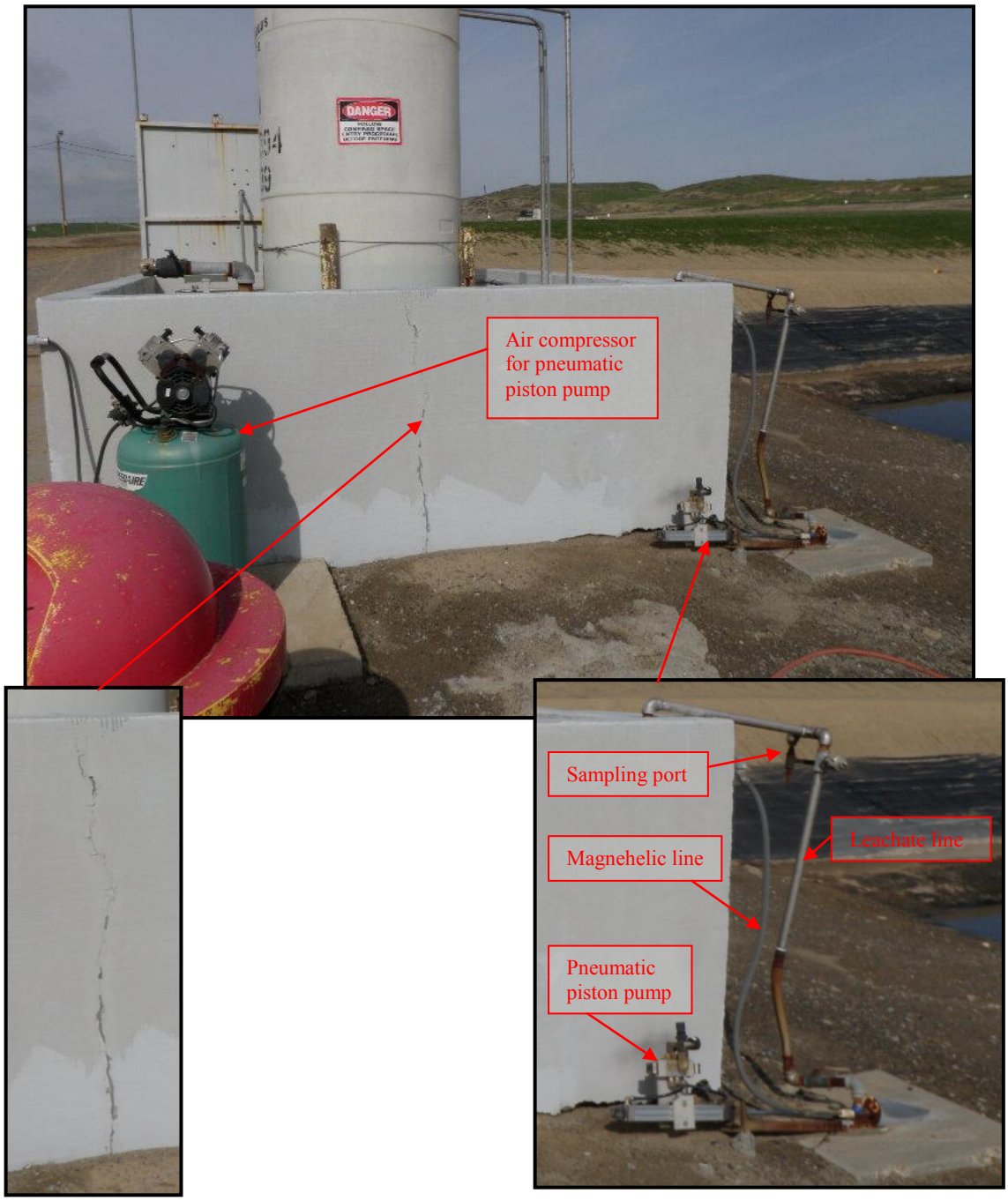


The inspectors observed an accumulation of unknown material along the waterline of P-14 (see photograph above - facing east). The cropped and enlarged inset photograph shows a close-up of some of the unknown material. Note: The P-14 leachate collection tank is located off-camera to the right.


P-14: Leachate Collection Tank (facing east). Note: The panel on the left side contains the high level alarm and the magnehelic device used for determining the sump liquid level (i.e., leachate under the surface impoundment).




P-14: Pump-out connection used to remove the contents from the 90-day hazardous waste storage tank (facing north). Note: The sump has a pump which is used to transfer any fluid which may accumulate from rainfall events into the P-14 leachate collection tank. The inspectors noted several areas where the secondary containment system was repaired.




The inspectors noted cracks along the outside portion of the secondary containment system for the P-14 leachate collection tank (facing north; see cropped and enlarged inset on the left). As noted on the previous page, the cracks inside the secondary containment system were repaired.

The inset photograph on the right (cropped and enlarged) shows the P-14 riser assembly.


P-14 Unloading Area
(facing east).

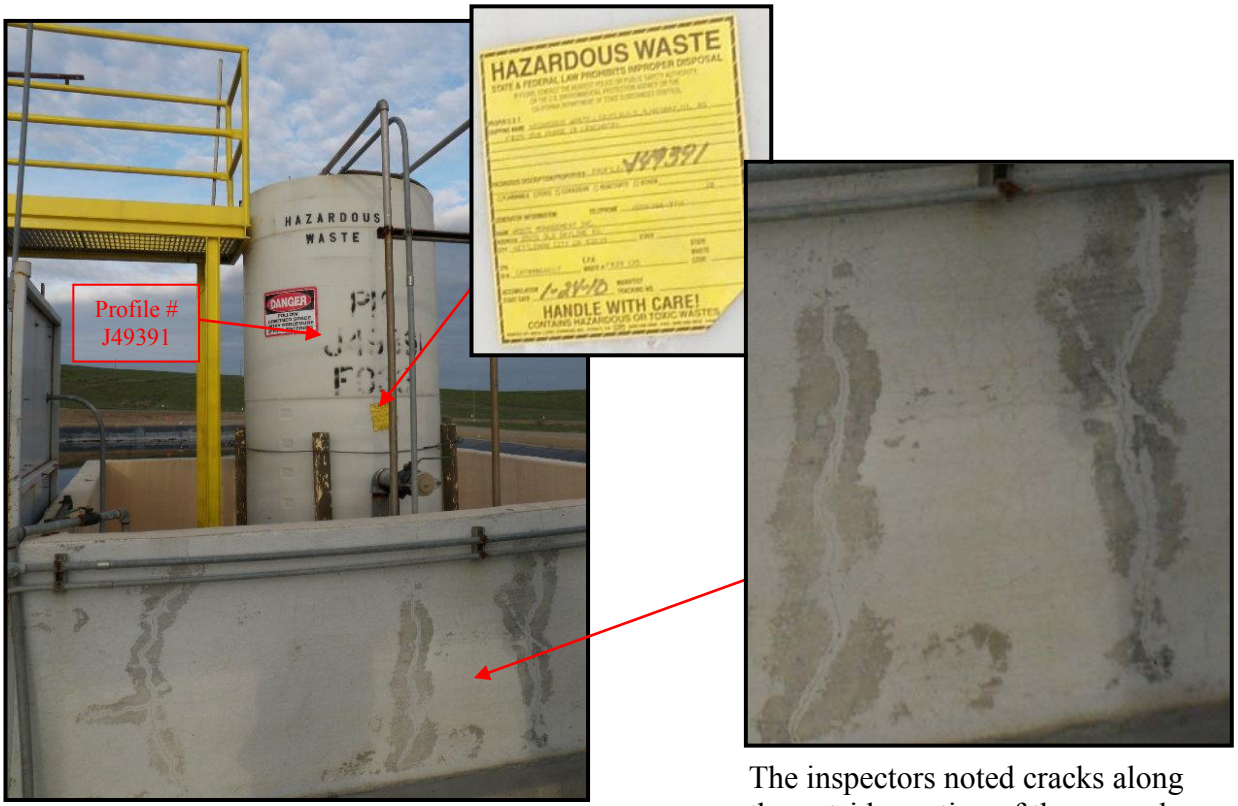
The top inset photograph shows the hose which is connected to the vehicles for off-loading. The bottom inset photograph (cropped and enlarged) shows areas where unknown material is accumulating along the waterline of P-14.

Surface Impoundment P-16

The inspectors toured this area, which is located on the northern part of the facility. P-16 is located south of P-14. (Note: P-15, a freshwater pond used for dust suppression, is located between P-14 and P-16). The layout of the surface impoundment and the associated equipment (i.e., riser, above-ground hazardous waste storage tank, secondary containment system, etc.) is similar to the layout of surface impoundments P-9 and P-14. Photographs and details of this area are provided below.

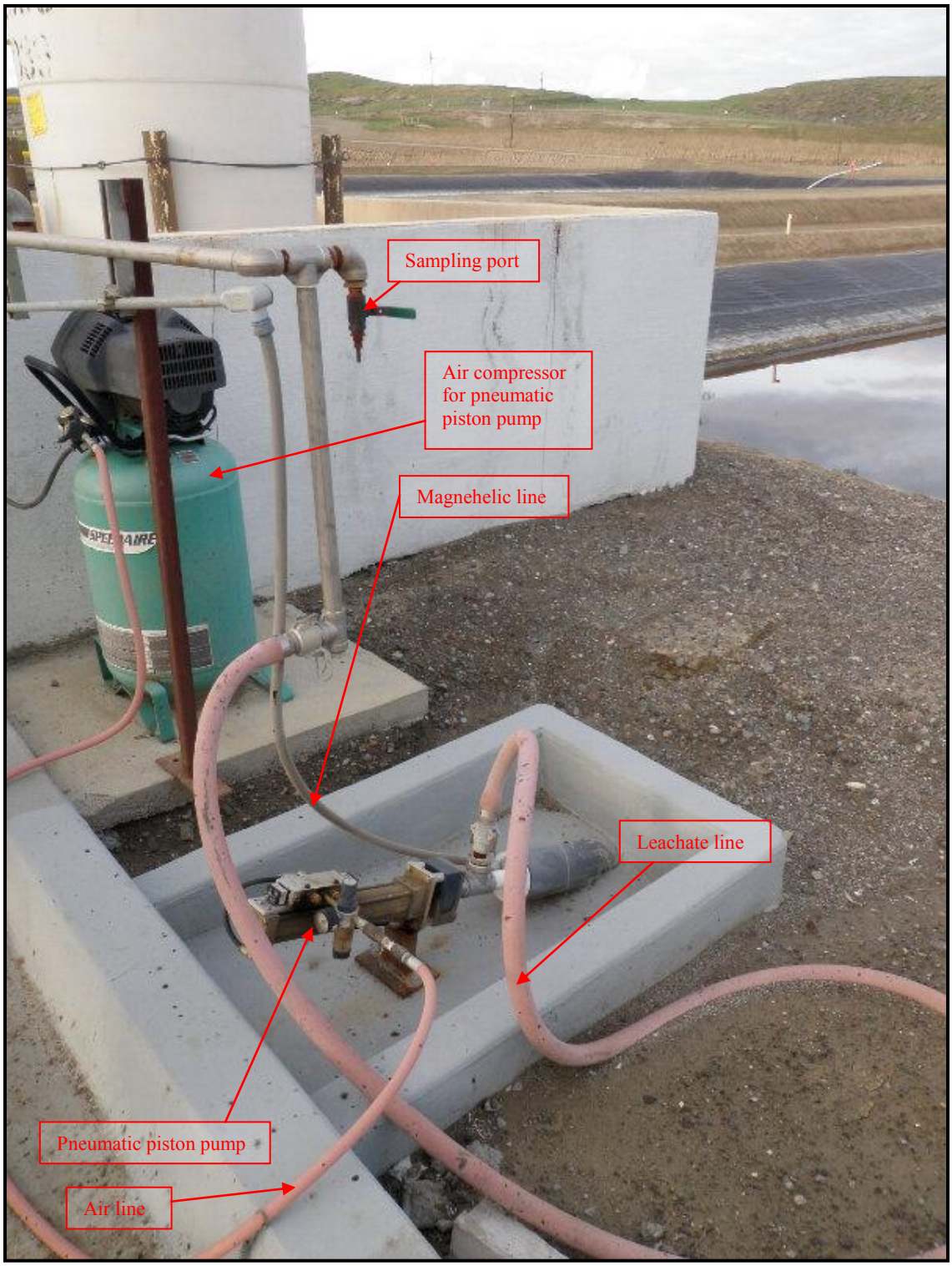

The inspectors observed an accumulation of unknown material along the waterline of P-16 (see photograph above - facing east). The cropped and enlarged inset photograph shows a close-up of some of the unknown material. Note: The P-16 leachate collection tank is located off-camera to the right.

P-16: Leachate collection tank and unloading area (facing south)




P-16: Leachate Collection Tank (facing east). Note: The panel on the left side contains the high level alarm and the magnehelic device used for determining the sump liquid level. The inset HW label is cropped and enlarged.

The inspectors noted cracks along the outside portion of the secondary containment system for the P-16 leachate collection tank (facing east; cropped and enlarged).




P-16 riser assembly (facing northeast)

Landfill B-17

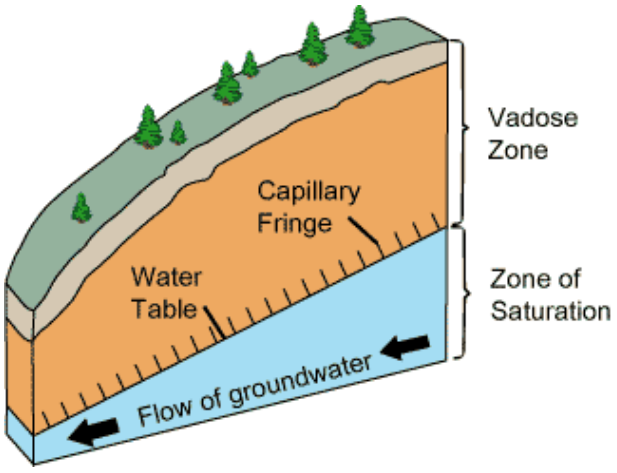
The following photograph is a composite of three photographs of B-17 (facing north). This is the currently operating municipal/solid waste landfill. The daily cover requirement is met with a large tarp.

Landfill B-18: Background

Landfill B-18 currently is permitted to accept RCRA, TSCA, and non-RCRA wastes. Solid wastes were accepted at the unit from 1998 through 2009.

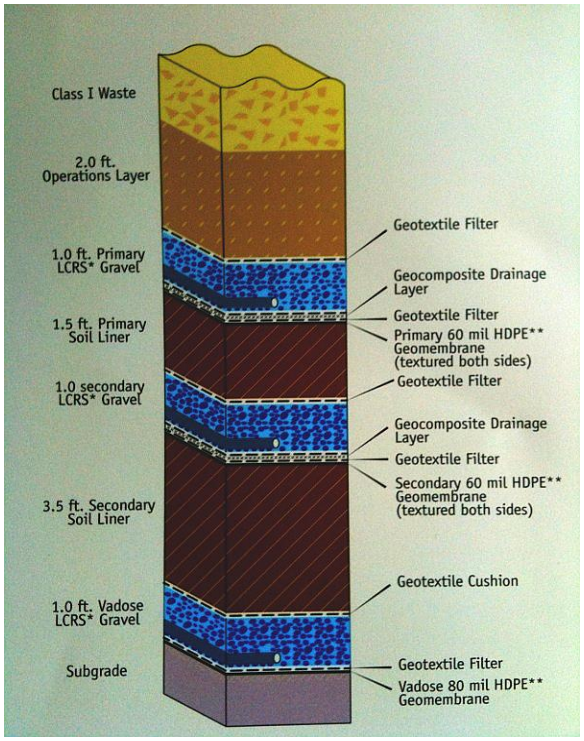
Located south of the BSU and FSU, B-18 is divided into four phases (i.e., Phases 1A, 1B, 2A, and 2B). Similar to the surface impoundments, each phase is equipped with a 90-day (hazardous waste) leachate collection tank system. Unlike the surface impoundments, three risers are associated with each tank system (i.e., primary, secondary, and vadose). The primary riser is the one closest to the landfill. The secondary riser is the one that is second closest to the landfill. The vadose riser is the one farthest away from the landfill.

*The vadose zone, also termed the unsaturated zone, is the portion of Earth between the land surface and the saturation zone. It extends from the top of the ground surface to the water table. The capillary fringe is the layer in the subsurface where water held in the pores between the particles of soil can be exchanged between the vadose zone and the saturated zone containing groundwater. Movement of water within the vadose zone is a factor in contaminant transport.*




Cross-section of a hill slope depicting the vadose zone, capillary fringe, water table, and saturated zone. *(Source: United States Geological Survey.)*

Sumps underneath each section of the landfill (primary, secondary, and vadose) collect any leachate (see example to the right). The sump level at each riser is checked on a daily basis and recorded on the daily inspection checklist. Once the level on a sump reaches an action level (typically 20 inches), the sump is pumped out into an above-ground open-top 90-day hazardous waste storage tank. A copy of the SDP ("Leachate Removal Procedure" – SDP Number ET-201) which covers the procedures for pumping out the leachate into the tanks is attached as Attachment #13. Each phase of the landfill has its own 90-day hazardous waste storage tank which is emptied out every 90 days or less. Each tank system is equipped with:



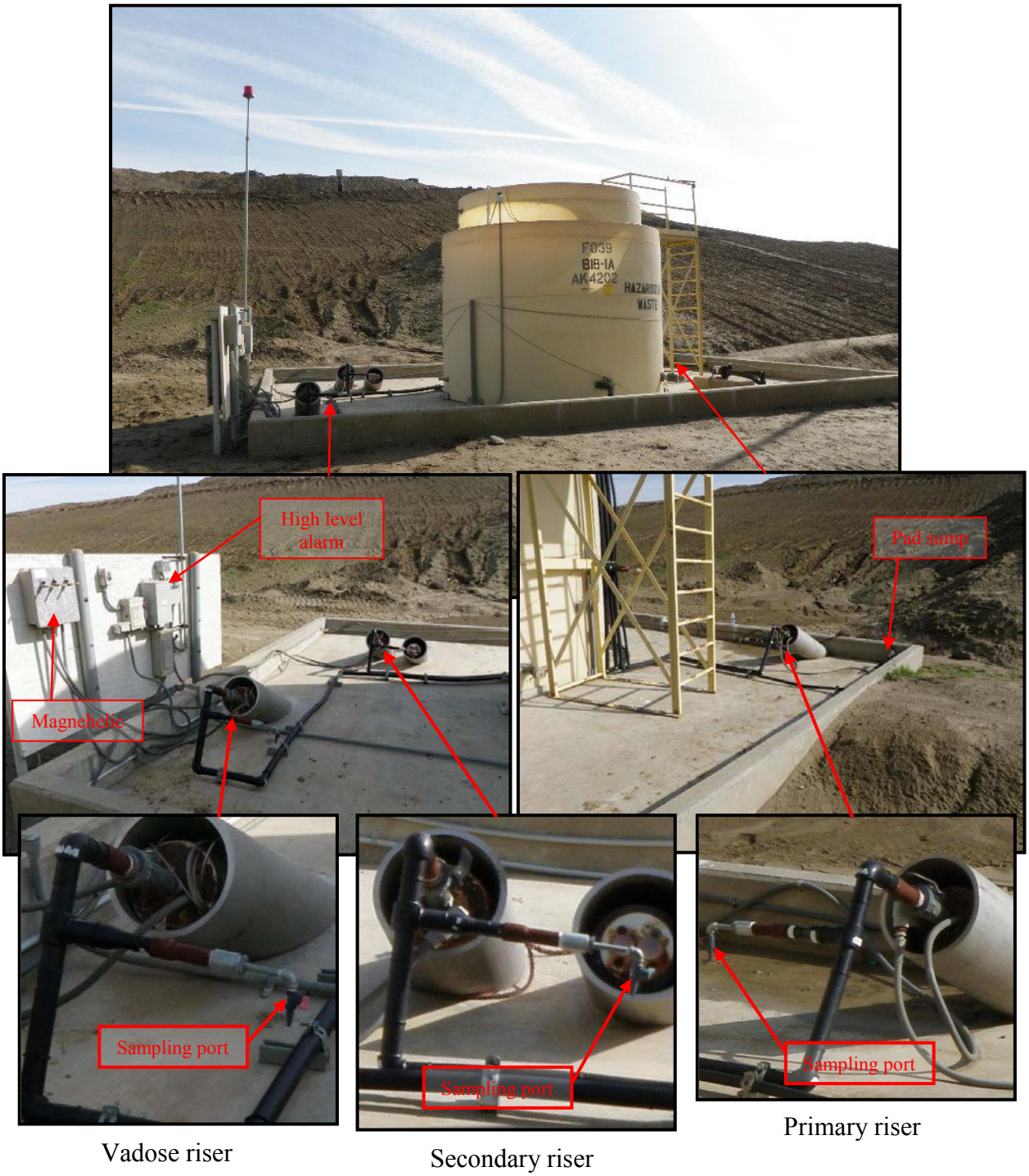

- an external liner secondary containment system;
- sump pumps (for removal of accumulated liquids including rainwater from the secondary containment system and the bermed pad where the tank system is placed);
- high level alarm (to comply with the two-foot freeboard requirement);
- magnehelic (to measure the liquid level in the landfill's sump); and,
- riser assemblies (one per section - primary, secondary, and vadose - to convey the liquids from the landfill's sumps to the tank).

Like the hazardous waste tanks associated with the surface impoundments, a sample is taken from each of the 90-day hazardous waste tanks associated with B-18 and a full F039 analytical testing is conducted every two years. If the results show that TS are met, the leachate is placed into one of the three surface impoundments (P-9, P-14 or P-16). Per the WAP, this profile is valid for two years.

Every two years, a sample is taken from each tank at B-18 and a full F039 analytical testing is conducted. A copy of the SDP ("Leachate Tank Sampling" – SDP Number ET-202) which covers the procedures for sampling the leachate in the tanks is attached as Attachment #14. If the results from the sampling event show that TS are met, the leachate is placed into one of the three surface impoundments. Per the WAP, this profile is valid for two years. EPA did not identify any instances where the leachate from any of the B-18 tanks was shipped off-site for incineration.

Landfill B-18 Leachate Collection Tank 1A

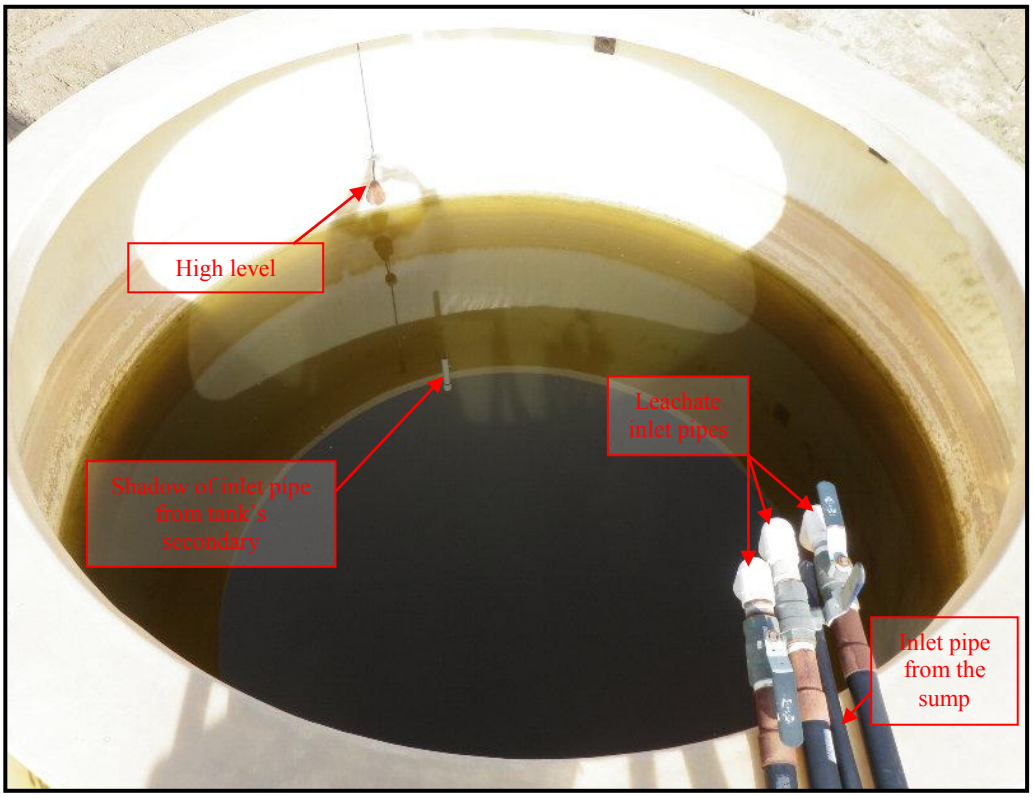
As stated previously, each phase of landfill B-18 has a leachate collection tank (i.e., 90-day hazardous waste storage tank). Phase 1A is located on the northwest section of B-18. Photographs and details of the Phase 1A leachate collection Tank 1A area (see photograph below – facing east) are provided below. Note: The inset photographs of the risers are cropped and enlarged.



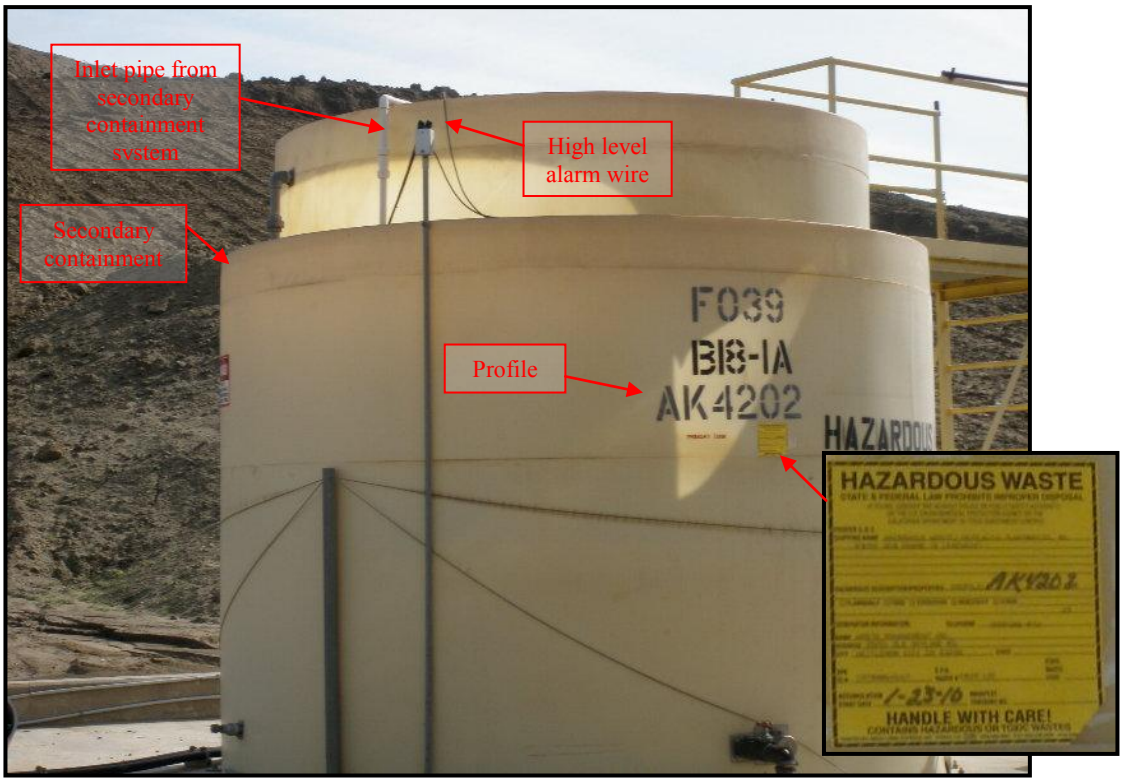

Vadose riser

Secondary riser

Primary riser



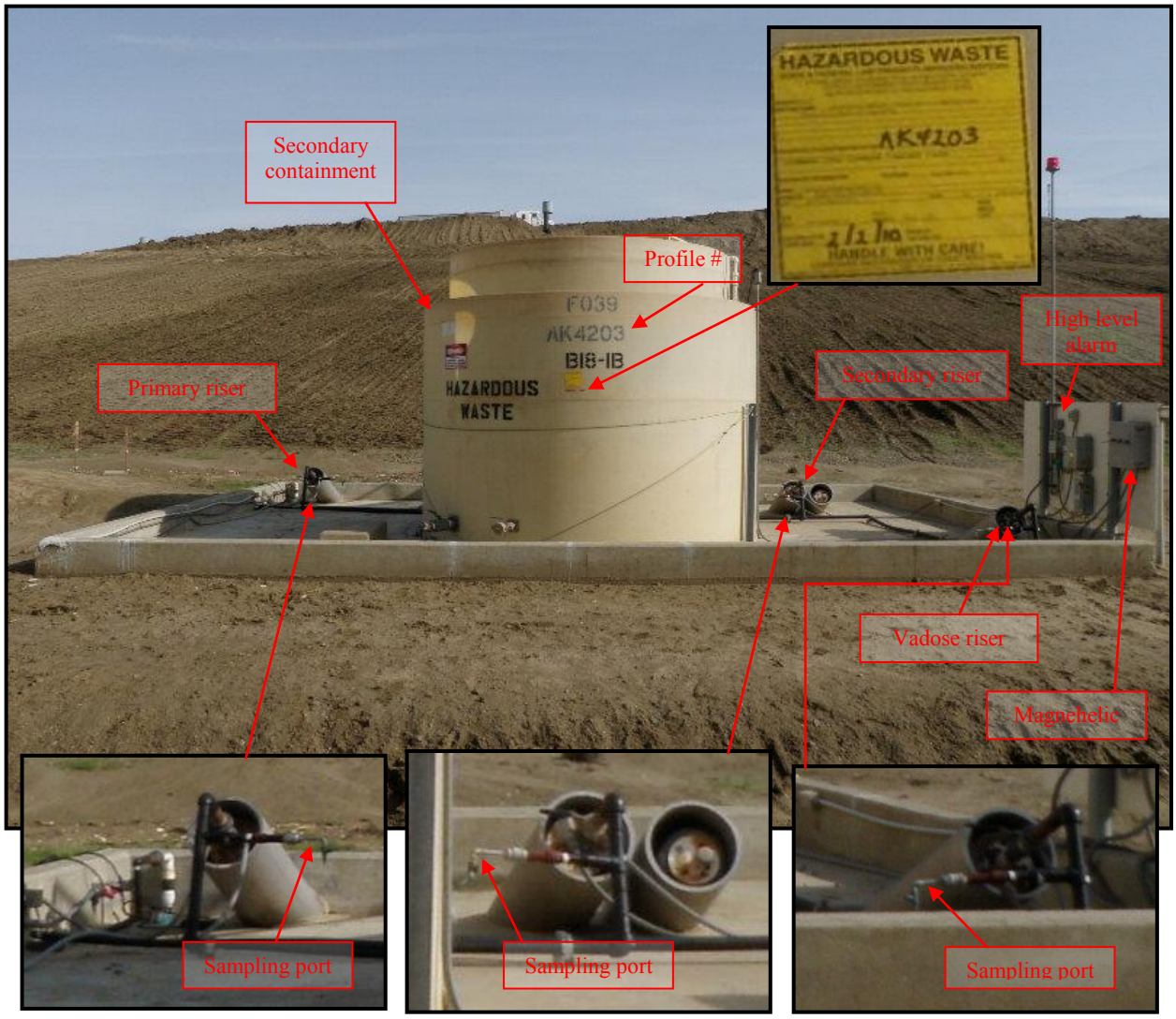

B-18 Phase 1A leachate collection tank




Note: HW label is cropped and enlarged

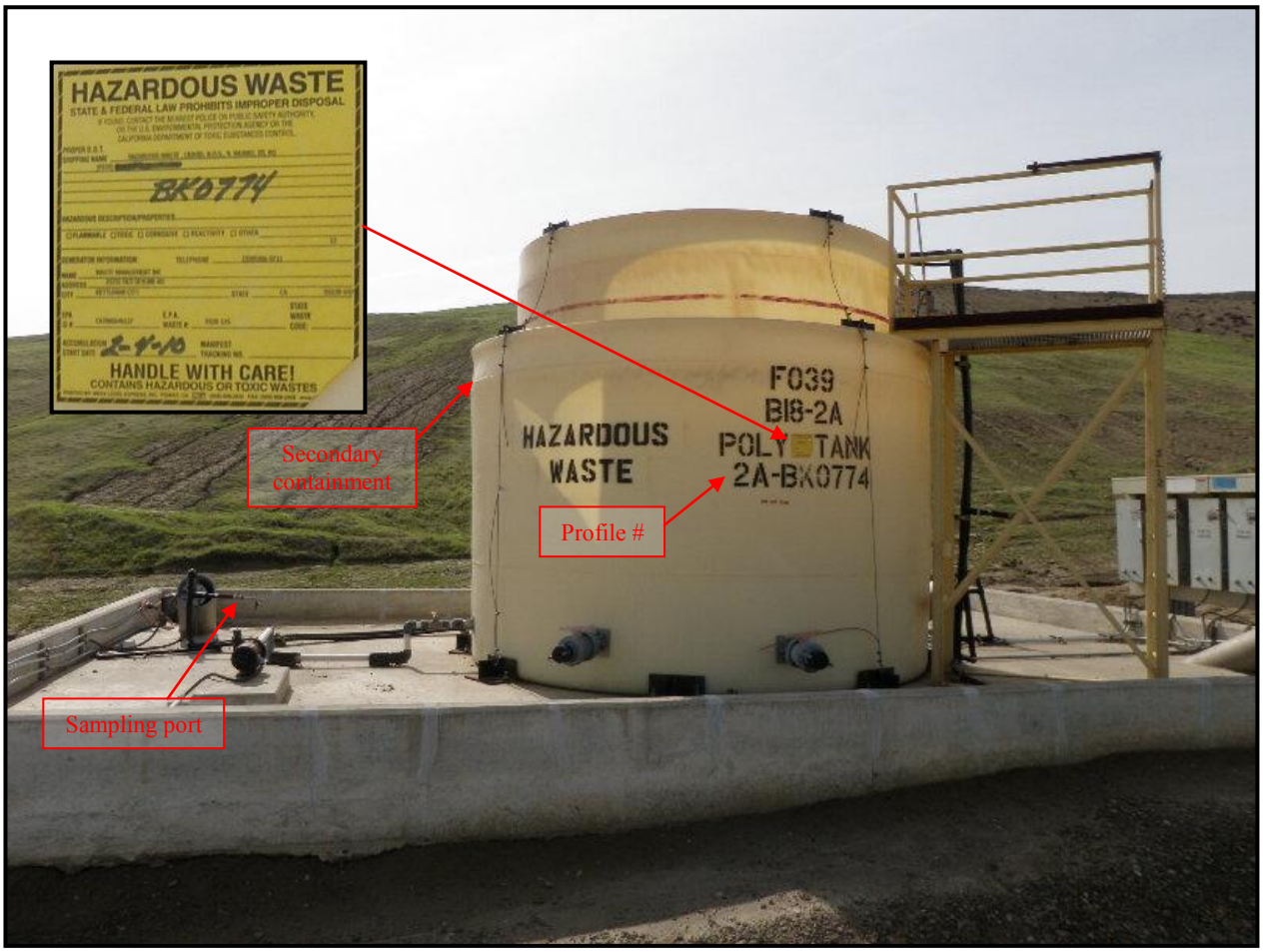
Landfill B-18 Leachate Collection Tank 1B

Phase 1B is located on the southwest section of B-18. Photographs and details of the Phase 1B leachate collection Tank 1B area (see photograph below – facing east) are provided below. The layout of the leachate collection tank system (i.e., risers, above-ground hazardous waste storage tank, secondary containment system, pad sump, etc.) is similar to the layout of the system for leachate collection Tank 1A. Each riser is also equipped with a sampling port. Note: The inset photographs of the risers and the hazardous waste label are cropped and enlarged.



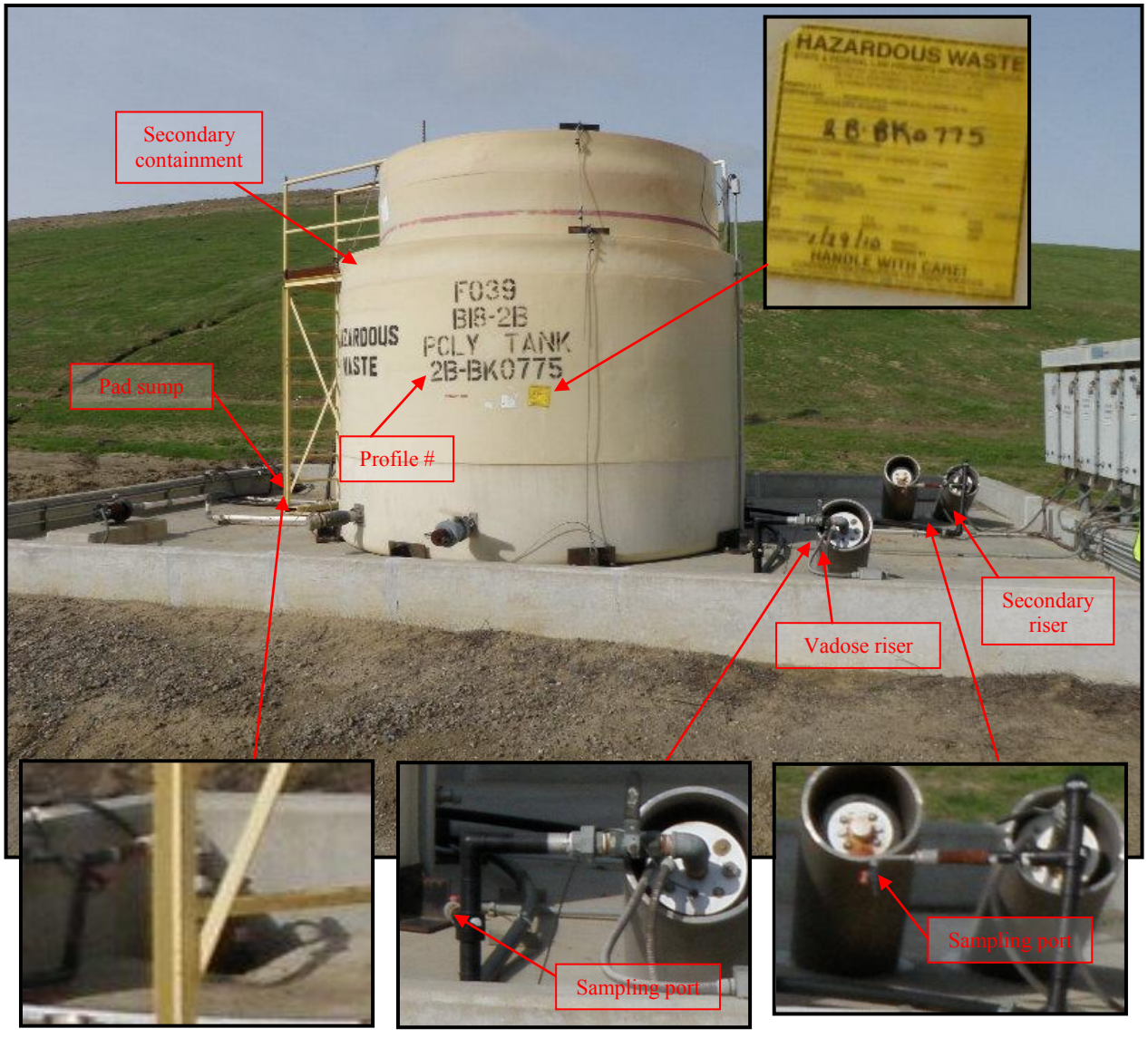
Landfill B-18 Leachate Collection Tank 2A

Phase 2A is located on the northeast section of B-18. Photographs and details of the Phase 2A leachate collection Tank 2A area (see photograph below – facing south) are provided below. The layout of the leachate collection tank system (i.e., risers, above-ground hazardous waste storage tank, secondary containment system, pad sump, etc.) is similar to the layout of the system for leachate collection Tanks 1A and 1B. Each riser (primary, secondary, and vadose) is also equipped with a sampling port. The inset photograph of the hazardous waste label is cropped and enlarged.



Landfill B-18 Leachate Collection Tank 2B

Phase 2B is located on the southeast section of B-18. Photographs and details of the Phase 2B leachate collection Tank 2B area (see photograph below – facing west) are provided below. The layout of the leachate collection tank system (i.e., risers, above-ground hazardous waste storage tank, secondary containment system, pad sump, etc.) is similar to the layout of the system for leachate collection Tanks 1A, 1B, and 2A. Each riser (primary, secondary, and vadose) is also equipped with a sampling port. Note: The inset photographs of the risers, hazardous waste label, and the pad sump are cropped and enlarged.



Landfill B-19: Background

Landfill B-19, located directly north of surface impoundment P-9, is no longer allowed to accept TSCA or non-RCRA hazardous wastes. Currently it is permitted to receive municipal and solid wastes.

Under an EPA research, development and demonstration (RD&D) program, Landfill B-19 has a three year permit (with three possible extensions) to operate the unit (i.e., the portion receiving municipal and solid wastes) as a bio-reactor. The goal of the project is to consolidate and reduce the waste, and generate gas. Ultimately, in addition to increasing the useful life of the landfill, another goal is that enough gas is generated to use as a fuel source to generate electricity.

In this project, non-hazardous liquids with less than 5% solids (e.g., liquids from soda manufacturers, etc.) are introduced through injection wells. For liquids which may have 5% or greater solids, those liquids are introduced through an infiltration gallery (an area with pipes buried underneath compost to facilitate transfer of the liquids – see photograph below).


According to the facility representative, any liquid collected in the leachate collection tank (Tank 1A) is re-introduced back into the landfill. CWM determined the leachate from this unit to be non-hazardous class II/III municipal waste. Details of this classification are included in the NEIC report (see Attachment #2).

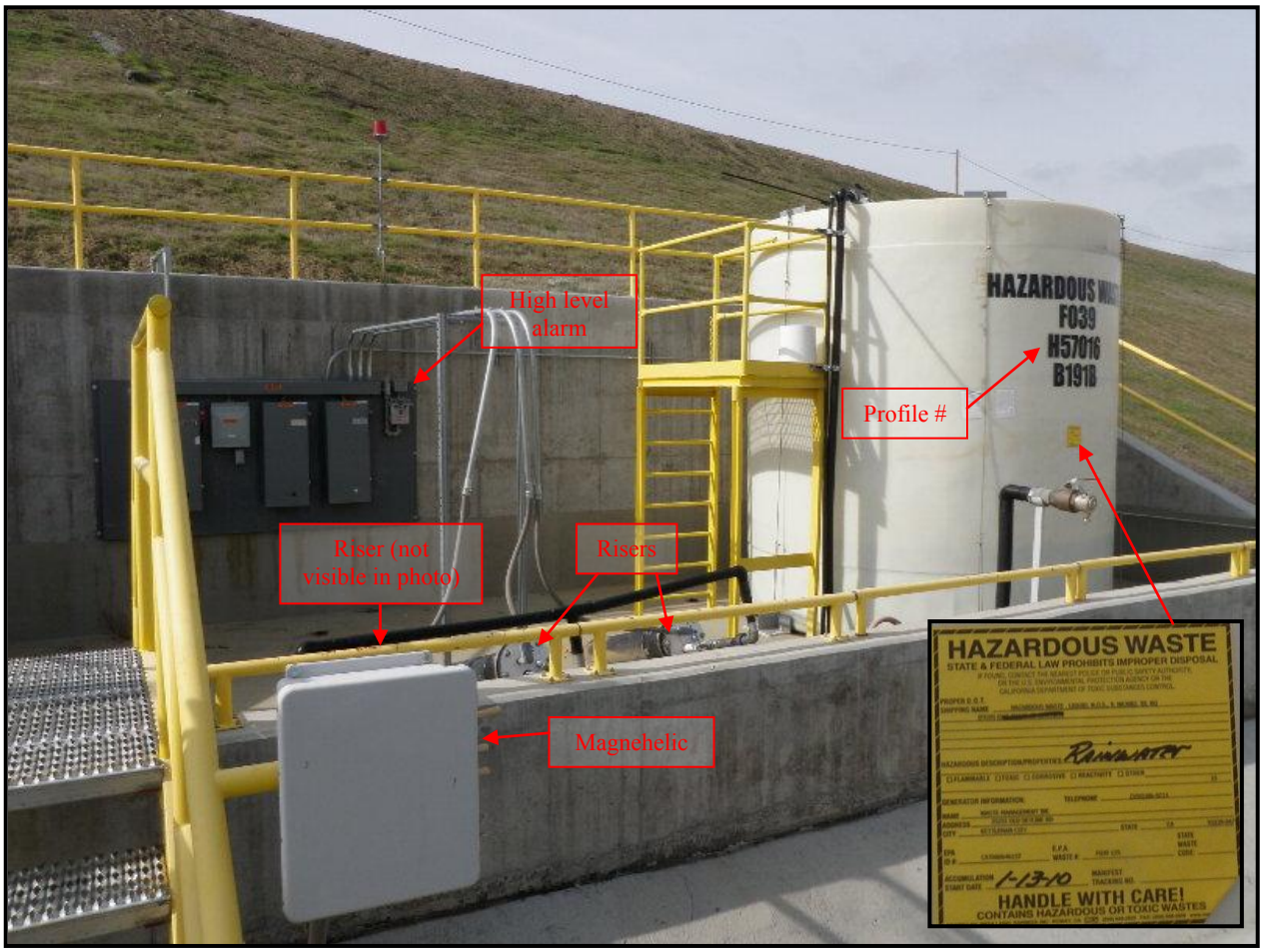
The basic background information covered for landfill B-18 (e.g. components, leachate sampling and removal procedures, etc.) also applies to the leachate collection tanks which collect the leachate from the three hazardous waste phases of the landfill (Phases 1B, 2, and 3).

However, there are several configuration differences for the landfill B-19 leachate collection tank systems. Specifically:

- the external liner secondary containment system is not a larger tank, but a bermed area; and,
- there is only one sump pump (for removal of accumulated liquids including rainwater from the secondary containment system).

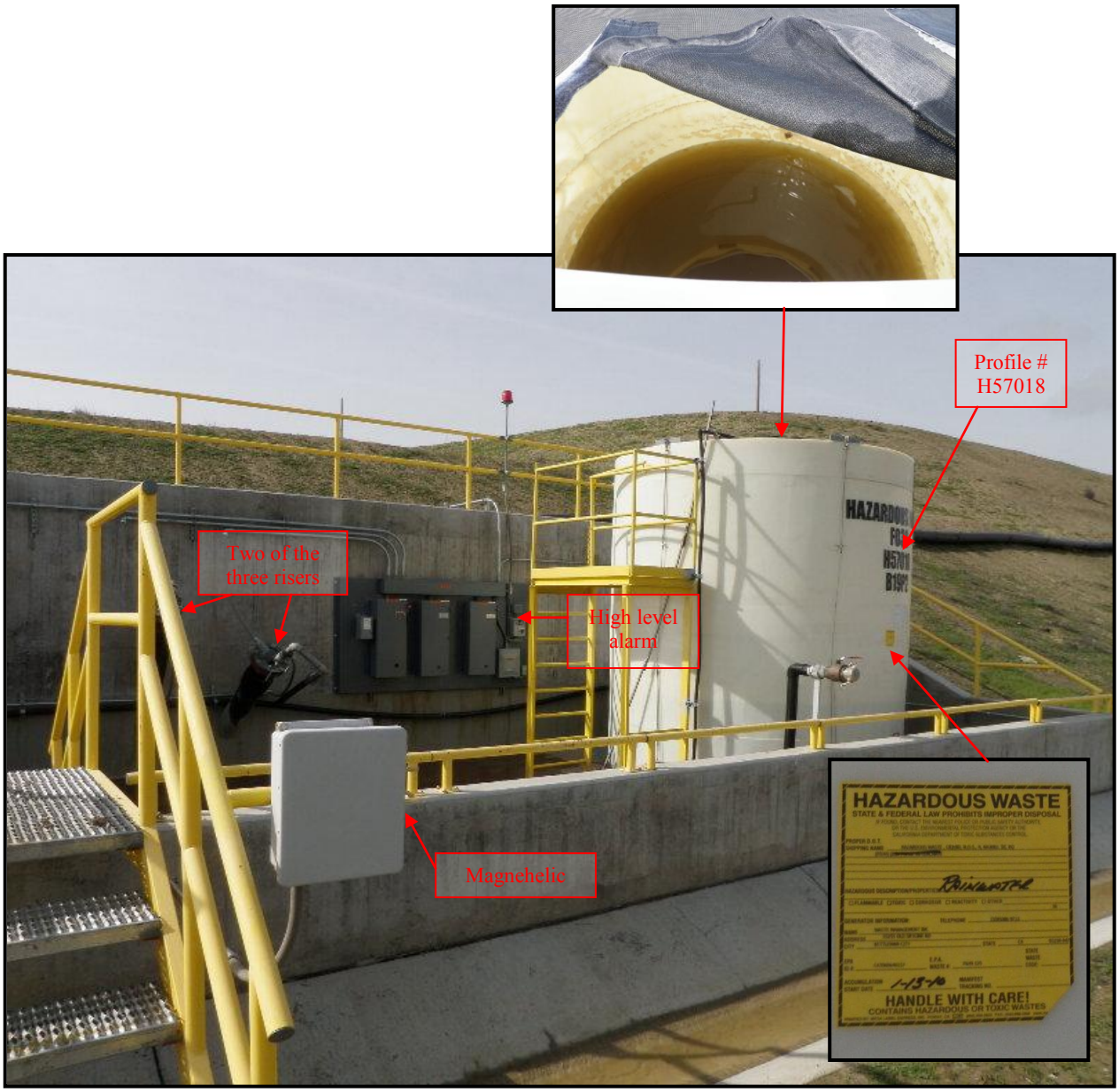
Landfill B-19 Leachate Collection Tank 1B

As stated above, landfill B-19 has three landfill leachate collection tanks which collect the leachate from the three hazardous waste phases of the landfill (Phases 1B, 2, and 3). Phase 1B is located on the northeast section of B-19. The layout of the leachate collection tank system (i.e., risers, above-ground hazardous waste storage tank, secondary containment system, pad sump, etc.) is similar to the layout of the systems for the landfill B-18 leachate collection tanks. Photographs and details of the Phase 1B leachate collection Tank 1B area are provided below. The inset photograph of the hazardous waste label is cropped and enlarged.



Landfill B-19 Leachate Collection Tank Phase 2

Phase 2 is located on the southeast section of B-19. The layout of the leachate collection tank system (i.e., risers, above-ground hazardous waste storage tank, secondary containment system, pad sump, etc.) is similar to the layout of the system for leachate collection Tank 1B. Photographs and details of the Phase 2 leachate collection Tank P2 area are provided below. The inset photograph of the hazardous waste label is cropped and enlarged.



Landfill B-19 Leachate Collection Tank Phase 3

Phase 3 is located on the southwest section of B-19. The layout of the leachate collection tank system (i.e., risers, above-ground hazardous waste storage tank, secondary containment system, pad sump, etc.) is similar to the layout of the systems for leachate collection Tanks 1B and P2 (see photograph below – facing north). However, unlike the other leachate collection tanks for landfill B-19, the risers are located outside of the secondary containment pad for the tank. The risers are located on a separate containment area located on the west side of the tank. Photographs and details of the Phase 3 leachate collection Tank P3 area are provided below. The inset photograph of the hazardous waste label is cropped and enlarged.


Vadose riser

Primary riser

Secondary riser

The inspectors noted that this area contained rainwater from the previous night's rain. This rainwater will be pumped into the adjacent tank.

**RECORD REVIEW**

2007 and 2009 Biennial Reports

The inspectors reviewed the 2007 biennial report during the inspection. Subsequent to the inspection, EPA verified submittal of the 2009 biennial report.

Inspection Records

The inspectors reviewed the daily, weekly, and monthly inspection records for the month of January 2010.

For informational purposes, a copy of the January 24, 2010 Daily Inspection Program checklist is enclosed (see Attachment #17).

The daily inspection checklists include recording of:

- liquid levels in the sumps of the landfills and surface impoundments (current and previous day);
- liquid levels in the surface impoundments (to ensure the 2-foot minimum freeboard requirement is not exceeded; and,
- pump out events (including the estimated quantity pumped)

The inspectors were able to verify that the pumping out of the P-16 sump on January 24, 2010 matched the accumulation start date noted on the hazardous waste label on Tank P-16.

Several "Remedial Work Orders" initiated due to issues identified during the daily inspections were reviewed.

Training Plan and Records

The inspectors focused on the training documentation for the personnel responsible for conducting the inspections around the facility. Specifically, the inspectors requested and reviewed records for Messrs. Ed Fenley (lead inspector), Joe Jimmeye (second inspector), and Steve Holshouser (primary sampler). The records reviewed included the job tiles, position descriptions, training requirements, and records of the most recent training taken. Copies of the most recent refresher training for the above personnel are enclosed as Attachment #4.

Contingency Plan

The plan was reviewed.

The locations of randomly selected emergency equipment observed during the investigation were matched with the locations of equipment identified in the plan.

90-day Hazardous Waste Tank Requirements (at the landfills and surface impoundments)

*Tank certification records*

The records for the following tanks were obtained and reviewed: P-9, P-14, P-16, B-18 Phases 1A, 1B, 2A and 2B, and B-19, Phases 1B, 2 and 3. Copies of the certifications are enclosed as Attachment #5.

*Overfill prevention controls*

The inspectors visually verified that each of the above referenced tanks were equipped with an overfill prevention device (i.e., alarm that sounds at the 2-foot freeboard level). Several of the alarms were tested during the investigation to verify that they were operational.

*Ancillary equipment*

The inspectors reviewed the leak test record, dated November 19, 2009, for the ancillary equipment (i.e., piping) for the above referenced tanks (see Single-Walled Ancillary Equipment Testing memo, Attachment #6).

During the investigation, the inspectors noted that the piping for P-9, P-14, and P-16 were not located within secondary containment. As such, the regulations require that the pipes be either double-walled or visually inspected for leaks on a daily basis. EPA understood that CWM was visually inspecting these affected ancillary equipment daily.

The inspectors noted that the "Daily Inspection Program" checklist required that the CWM inspector check the Leachate Collection and Removal Systems (LCRS). For example, for P-9 the inspection item was "check leachate riser pipe and magnehelic line for damage." EPA recommended that CWM modify this checklist item to make it clear that "leaks" should be looked for since that is what is stated in the regulations. CWM provided EPA with examples of the modified language (e.g., "Check leachate riser pipe and magnehelic line for damage and leaks") on the checklists during the investigation (see Attachment #7).

*Secondary containment*

Each of the above tanks is equipped with an external liner system. Due to the fact that all of the tanks are open-top tanks and subject to additional loading from rainfall, the inspectors requested verification of compliance with the secondary containment requirements. Specifically, pursuant to 22 CCR §66265.193(e)(1), the external liner system shall be:

*(A) designed or operated to contain 100 percent of the capacity of the largest tank within its boundary;*
*(B) designed or operated to prevent run-on and infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity, in addition to that required in subsection (e)(1)(A) of this section, to contain*

*run-on and infiltration. Such additional capacity shall be sufficient to contain run-on and infiltration of precipitation from a 25-year, 24-hour rainfall event.*

During the investigation, Mr. Henry informed EPA that the 25-year, 24-hour rainfall event amount was now increased to 10.3 inches.

**B-18 Leachate Collection Tanks**

Based on the information from the as-built drawings and other documentation provided by the facility representatives, EPA verified that the secondary containment capacities for the B-18 leachate collection tanks were adequate. However, EPA noted that if the rainfall from the bermed pads where the leachate collection tank systems are located was "automatically" pumped into each collection tank, there would be insufficient secondary containment capacity. Therefore, EPA recommended that CWM ensure that the sump pumps on the pads are not set to automatically transfer any accumulated liquid from the pad to the leachate collection tank.

Mr. Henry informed EPA that each of the bermed pads was constructed with a cut-out (i.e., a notch in the berm) on the side facing the landfill. In the event of a catastrophic event, any released liquid would be released on the side closest to the landfill.

**B-19 Leachate Collection Tanks**

Based on the information from the as-built drawings, EPA verified that the secondary containment capacities for the B-19 leachate collection tanks were adequate.

**P-9, P-14, and P-16 Leachate Collection Tanks**

Complete as-built drawings for these units were not available at the time of the investigation. Therefore, EPA took measurements of the P-9 leachate collection tank system. P-14 and P-16 were not measured since it appeared that the construction of all three tank systems was identical.

Based on the measurements and subsequent calculations, EPA verified that the secondary containment capacity for these units was adequate.

Manifests

Outgoing manifests of the leachate from P-16 since 2007 were obtained and reviewed (see Attachment #8).

Laboratory Records

The inspectors collected records from the CWM-KHF Laboratory, and subsequently obtained 2005 – 2010 laboratory records from CWM in response to a RCRA request for information. EPA's review focused on laboratory data used by CWM to make land disposal

decisions. On May 27, 2010, EPA gave written notice to CWM of concerns about the reliability of data generated by the CWM-KHF laboratory, and recommended that CWM stop using the CWM-KHF laboratory until those concerns were addressed. EPA subsequently requested CWM-KHF laboratory post-treatment analytical data for 2005 – 2010. EPA reviewed select portions of the records submitted to evaluate CWM compliance with hazardous waste management requirements.

EPA reviewed selected laboratory data provided by CWM, including all the data for the year 2005, and data for the months of January and February for years 2006 through 2010. For the 2006 through 2010 data, a detailed independent review was performed on 11.0% of the data packages submitted by CWM (54 randomly selected data packages out of 492 data packages). This review included recalculation of results from calibration information, verification of quality control information, and technical acceptability of applied laboratory procedures. Additionally, also for the 2006 – 2010 data, a limited review of indicator quality control information was performed on 15.4% of the data packages submitted by CWM (76 data packages systematically drawn out of 492 data packages.) The information reviewed included accuracy of cadmium concentration in quality control samples ICS1 and ICS2, and CWM's internal pass/fail evaluation of their quality control samples ICS1, ICS2, and ICV.

A detailed summary by calendar year showing how many data packages were selected for review is provided in the table below.

| Calendar Year | | **2006** | **2007** | **2008** | **2009** | **2010** |
|---|---|---|---|---|---|---|
| Total Packages Provided by CWM | | 130 | 126 | 102 | 91 | 43 |
| Random Draw- Detailed Review | Number of Data Packages | 25 | 15 | 7 | 5 | 2 |
| | Percentage of Data Packages | 19.2% | 11.9% | 6.9% | 5.5% | 4.6% |
| Systematic Draw – Limited Review | Number of Data Packages | 20 | 23 | 13 | 10 | 10 |
| | Percentage of Data Packages | 15.4% | 18.2% | 12.7% | 11.0% | 23.2% |

The CWM-KHF laboratory records show:

- instances where post-treatment results document exceedences of treatment standards; and,

- circumstances where CWM did not follow the requirements of the applicable analytical method.

The following table summarizes examples of UTS exceedances identified during EPA's review of a random selection of CWM's laboratory records. Attachment #24 contains copies of the CWM laboratory records that show the analytical results listed below.

**Examples of UTS Exceedances Identified From CWM Laboratory Records**

| Sample Date & Sample # | Constit-uent | §268.48 UTS-TCLP (mg/L) | CWM-KHF Analytical Result-TCLP (mg/L) | Waste Code | Description |
|---|---|---|---|---|---|
| 1. ***(a)** 1/18/06 6010-04 | Cd | 0.11 | Average of 0.36 & 0.4 = 0.20 | F006 | STE result reported as <0.10. KHF data shows concentration in sample as 0.36 mg/L. Duplicate analysis showed 0.04. Even if averaged, result would be 0.20 which is > 0.11. Analysis Report states „pass' post-treatment standards. |
| 2. ***(b)** 1/26/06 6030-03 | Cr | 0.60 | 0.74 | D006 D008 | Pb (D008) and Cd (D006) were identified as wastes. Analytical results for Cr exceeded UTS. Lab Metals Analysis Report states „pass' post- treatment standards. |
| 3. ***(c)** 9/22/06 6270-05 | Cr | 0.60 | 1.98 | D008 | Lab Metals Analysis Report states „pass' post- treatment standards. |
| 4. ***(d)** 1/26/07 7029-06 | Cr | 0.60 | 0.86 | D007 D008 | D008 waste containing Pb indentified on profile sheet. Analytical results for Cr exceeded UTS. Lab Metals Analysis Report states „pass' post- treatment standards. |
| 5. 1/18/08 8008-04 | Ag Tl | 0.14 0.20 | 0.29 0.22 | D004 D006 D008 D010 | Lab Metals Analysis Report states „pass' post- treatment standards. |

***(a)** Generator's Waste Profile Sheet for F006 under 2.j "Chemical Composition" lists cadmium (Cd) as a constituent present in any concentration'. Raw data based on sample analysis and duplicate analysis was incorrectly reported. This resulted in 16.8 tons being incorrectly characterized post-treatment and disposed without meeting UTS.

***(b)** Generator's Waste Profile Sheet under 2.j "Chemical Composition" Attachment 2 lists chromium (Cr) as an additional constituent. Analytical results show that the UTS for Cr was exceeded and the waste disposed without meeting treatment standards.

***(c)** Process generating the waste was identified as sandblasting. Sand with metals and rust comprised the solids. Chromium is often a contaminant generated as a result of sandblasting. The exceedence of UTS for Cr in a waste typically containing Cr as a contaminant resulted in disposal of waste that did not meet treatment standard. Analysis of waste strongly indicated that the generator did not completely identify constituents likely to be present at the point of generation and, according to the CWM-KHF WAP, the profile should have been re-evaluated.

***(d)** Presence of Chromium in waste verified by analysis and UTS for Cr was exceeded.

Waste Excavation Information

CWM's response to EPA's July 2010 request for information included documentation of instances when CWM excavated waste from a hazardous waste landfill unit at the Facility. A summary of the excavations reported is provided below.

Note: The CWM # in the table refers to the number of the incident listed on the table, "Response to RFI #9 – List of Wastes Excavated from Hazardous Waste Land-Fill Units at KHF – January 1, 2005 – July 23, 2010" in CWM's response.

**Waste Excavated From Landfill B-18 from 2005 - 2010**

| Receipt Date/ CWM # | Excavation Date | Description |
|---|---|---|
| 12/29/04 #1 | 1/6/05 | Multiple loads received- some non-RCRA and some RCRA; profile on RCRA waste loads required stabilization prior to landfilling; RCRA waste loads released for landfilling based on incomplete manifest review; RCRA waste code D008. |
| 4/30/04 #2 | 5/7/05 | Tank pieces should have been microencapsulated; Non-RCRA state code 161; RCRA code D007. |
| Incorrect date #3 | 6/25/05 | Waste received under incorrect profile for Non-RCRA state code 181; generator contacted KHF w/correct profile which was for RCRA debris (RCRA waste code not-specified) for macro- encapsulation. |
| 12/13/04 #4 | 11/1/05 | Two bins received - one Non-RCRA, one RCRA; bins switched and RCRA waste requiring macroencapsulation was landfilled w/o treatment; non-RCRA state code 181; RCRA waste code D010. |
| 3/30/04 #5 | 11/5/05 | One load of RCRA waste D008/Non-RCRA state code 611 received requiring stabilization; sampler wrote wrong profile which was for waste going to direct landfill; technician did not follow manifest review procedure; waste requiring stabilization went for direct landfill. |
| 11/22/04 #6 | 2/25/06 | Generator manifest specified a non-RCRA profile & also had RCRA D008 code; physical state was non-conforming to profile; KHF Receiving authorized disposal. |
| 5/2/05 #7 | 3/16/06 | Incoming manifest listed non-RCRA state code 571; per profile waste did not meet state LDR & required stabilization; however, attached state LDR Form had incorrect box selected, „can be disposed w/o trmt'; KHF computer system for that profile indicated „restricted waste requires trmt'; waste disposed w/o treatment. |
| 9/13/05 #8 | 11/1/06 1/10/07 | Two loads received under two manifests with same profile # with non-RCRA state code 261**;** both loads buried 9/13/05; generator notified KHF that loads incorrectly manifested/ waste was D004 & D008 requiring stabilization. |
| 12/10/04 | 3/9/07 | Profile on two drums on manifest identified waste as D008/state code |

| | | |
|---|---|---|
| #9 | | 611; KHF computer process code was incorrect indicating landfilling vs stabilization; „F22' comment in KHF computer system correctly identified treatment, however, KHF Receiving did not review „F22' comment; waste landfilled w/o treatment; error discovered when subsequent load of same waste arrived. |
| 7/3/06<br>#10 | 3/21/07 | F006/state code 181 received on manifest; Receiving Tech wrote incorrect process code & disposal location; waste was disposed of w/o treatment. |
| 3/13/06<br>#11 | 6/21/07 | D006/state code 571 received on manifest; Receiving issued wrong recipe - incorrect quantities of reagent used; waste landfilled; analytical results of May 2006 showed recipe failed. |
| 8/1/06<br>#12 | 6/27/07 | One bin under manifest profiled with state codes 352, 181, 223-non-RCRA solids & hydrocarbon contaminated soil; disposed of on 8/1/06; generator subsequently notified KHF that shipment could be F037; Review of generator provided analytical data showed waste did not meet F037 treatment standards; waste excavated and sent to CWM Arlington, OR for treatment/disposal. |
| 11/27/07<br>#13 | 5/17/07 | 24 drums of „non-RCRA' waste with state code 352 on hazardous waste manifest w/profile allowing direct landfill; after disposal, generator requested exhumation and subsequent incineration; waste sent to Port Arthur, TX for treatment/disposal. |
| 10/9/07<br>#14 | 1/19/08 | Waste received on manifest with D001 & state code 181 did not conform to profile for physical description; generator indicated waste contaminated with same contaminants w/same profile and treatment-microencapsulation; KHF processed and disposed of waste; later the same day, generator indicated wrong profile used; correct profile required macroencapsulation[1]. |
| 12/5/07<br>#15 | 1/31/2009 | Incorrect weight „keyed-in' by KHR resulting in insufficient quantity of reagent being used to treat D010/state code 181. |
| 5/14/08<br>#16 | 3/13/2009 | State code 181 waste received w/profile for landfilling; after load buried, generator contacted KHF stating profile was incorrect; correct profile requires microencapsulation[2] or macroencapsulation prior to burial. |
| 7/25/07<br>#17 | 3/11/2009 &<br>4/22/2009 | KHF experienced difficulty in treating high selenium waste - D010/state code 181; a multi-step treatment process was developed; due to calculation errors, not enough reagents added to each of the treatment steps. |
| 5/3/10<br>#18 | 7/1/ and<br>7/2010 &<br>7/14/10 | State code 352 waste received w/profile indicating burial; generator subsequently stated they used wrong profile and the waste should have been macroencapsulated. |

1 - Macroencapsulation – placement of waste in containment unit (e.g., roll off bin) with pozzolantic material (fly ash, cement kiln dust) to seal and fill voids

2 - Microencapsulation – particles surrounded by coating to prevent chemical interaction with surrounding environment

Subpart BB

Based on the information contained in section 44 of the Part B application, "Specific Information for Equipment", EPA requested documentation which verified CWM's compliance with the requirements of 22 CCR, Division 4.5, Chapter 14, Article 28 and 40 CFR Part 264 Subpart BB.

According to section 44.1 of the Part B application, the "*PCB liquids storage tank valves and the pump utilized for transfer for PCB liquids*" could be subject to these requirements. Specifically, "*RCRA-hazardous wastes with an organic concentration of at least 10 percent by weight may from time to time, be processed with his equipment. Specific information….is addressed in Section 44.2*."

Section 44.2 states:

"*Liquids currently managed at the PCB Flushing/Storage unit most often are not RCRA hazardous waste. However, there may be occurrences when PCB liquids with RCRA waste codes are processed. Monitoring and compliance of equipment in accordance with article 28 occurs when wastes with RCRA codes are being processed.*"

Mr. Turek clarified that CWM elected to not process PCB liquids with RCRA waste codes through the storage tank. Instead, such wastes are stored in two flammable liquid cabinets inside the PCB building.

Section 44.2 also states:

*"PCB Flushing/Storage unit equipment…are marked to be readily distinguishable from other equipment."*

Mr. Turek explained that since CWM elected not to perform these activities, none of the applicable equipment (summarized in Table 44-1 of the Part B permit application) is marked.

Additionally, Section 44.2 states:

*"Records pursuant to 22 CCR 66270.25(d) and 66264.1064 are maintained for the periods when RCRA waste codes are processed. These records are available for review upon request."*

Mr. Turek stated that there are no records since this activity was never conducted.

Based on the above information, no RCRA hazardous wastes were ever introduced into the tank system which would subject the tank's equipment to the requirements in subpart BB.

Subpart CC

All RCRA 90-day hazardous waste tanks are subject to the requirements of subpart CC unless a generator can demonstrate that all hazardous waste that enters the unit has an average volatile organic concentration (at the point of waste origination) of less than 500 ppm by weight.

Therefore, EPA requested documentation verifying that Tanks P-9, P-14, P-16, B-18-1A, B-18-1B, B-18-2A, B-18-2B, B-19-1B, B-19-P2, and B-19-P3 were in compliance with the requirements of 22 CCR, Division 4.5, Chapter 15, Article 28.5 and 40 CFR Part 265 Subpart CC. Specifically:

Based on the review of the facility's "Leachate Management Plan" (dated May 1997), the "Site Specific Groundwater Monitoring Plan" (dated May 2001), the analytical report on the leachate from P-9, P-16, and B-18, Phase 1B (dated December 11, 2009, see Attachment #15), and the summary results of the annual analytical testing conducted on each surface impoundment and landfill riser which contained sufficient liquid for sampling ("2008 Annual LCRS Fluid Analysis Report", dated April 23, 2009, see Attachment #16), EPA concurred with CWM's determinations that the 90-day accumulation tanks at the surface impoundments and landfills are currently exempt from the requirements of subpart CC.

**FOLLOW-UP TO 2007 NEIC FINDINGS**

As stated previously in this report, a copy of the 2007 NEIC report is included in this investigation report as Attachment #2. This section will identify EPA's follow-up activities to the potential violations which were referenced as Areas of Noncompliance (AON) in the above report and include information obtained during and subsequent to EPA's 2010 investigation.

AON #1: Failure to Determine Whether a Hazardous Waste [F039] Meets the Land Disposal Treatment Standards

*Issue Identified in the NEIC Report*

Pursuant to 22 CCR § 66268.7(a)(1) [40 CFR § 268.7(a)(1)], a generator of hazardous waste shall determine if the waste must be treated before it can be land disposed, i.e., whether the hazardous waste meets the treatment standards (TS).

The 2007 NEIC report states that CWM failed to determine if the multi-source leachate from the surface impoundments and landfills met the treatment standards (TS) at the point of generation.

CWM's determination of whether the leachate from the surface impoundments and landfills meet the TS is conducted on the contents of each of the leachate collection tanks instead of making the determination by sampling the leachate when it is pumped from the risers (i.e., at the point of generation). During the 2005 investigation, NEIC noted that CWM *"samples the leachate from the tanks when the tanks are ready to be emptied. The analytical results from the tank sampling are used to determine whether the leachate meets the LDR treatment standards for F039. If the leachate is determined to meet the LDR treatment standards, it is disposed of in one of the on-site permitted surface impoundments."*

*EPA 2010 Investigation*

The open-top leachate collection tank at each surface impoundment (i.e. P-9, P-14, and P-16) is equipped with a riser that conveys the leachate to the tank. Similarly, the open-top leachate collection tank at each landfill phase (i.e., B-18 Phases 1A, 1B, 2A, and 2B and B-19 Phases 1B, 2, and 3) is equipped with three risers that convey the leachate (from the primary, secondary, and vadose zones) to the tank. Each of these risers has a sampling port from which samples can be taken to determine whether the leachate meets the treatment standards before the leachate enters the collection tank.

The contents of each leachate collection tank (except for the tank at P-16) are tested by an off-site laboratory every two years to verify that the contents do not exceed the TS for any F039 constituents. During a discussion of the leachate collection activities during the February 2010 investigation, Mr. Turek informed the EPA inspectors that none of the F039 leachate that is pumped out of any riser is analyzed to verify whether it meets treatment standards prior to introduction to a leachate collection tank.

Annual analytical testing performed for Waste Discharge Requirements (WDRs), as required by permit number 98-058, imposed by the Central Valley Regional Water Quality Control Board, indicate repeated annual exceedances of several F039 constituents from several individual leachate collection risers. The chemical constituents evaluated for WDR purposes include approximately 147 of the 215 chemical constituents associated with F039 waste. The contaminants of concern (COCs) identified in the leachate and the concentrations of those COCs vary from year to year and riser to riser, showing that the composition of the leachate from each the different risers associated with a landfill unit can vary.

Additionally, each leachate collection tank takes its contents from multiple sources. In the case of each leachate collection tank at the surface impoundments, there are three sources:

- leachate from a pipe connected to the riser;
- stormwater from a pipe connected to the secondary containment sump pump; and,
- rainwater from above since it is an open-top tank.

In the case of each leachate collection tank at the landfills, there are up to six sources:

- leachate from a pipe connected to the primary riser;
- leachate from a pipe connected to the secondary riser;
- leachate from a pipe connected to the vadose riser;
- stormwater from a pipe connected to the secondary containment sump pump;
- stormwater from a pipe connected to the tertiary containment pad sump pump (applicable to the B18 Phases 1A, 1B, 2A, and 2B tanks); and,
- rainwater from above since it is an open-top tank.

Treatment or dilution of the leachate in the leachate collection tank is possible from evaporation, and from accumulation of stormwater, rainwater, and other leachate streams in the leachate collection tank. The inspectors observed that several of the leachate collection tanks contained rainwater, as marked on their hazardous waste labels. In the case of leachate collection tank B19-P2, the inspectors observed that it was approximately half full of rainwater (approximately 2,000 gallons), as documented by the description on the hazardous waste label in the "Landfill B-19 Leachate Collection Tank Phase 2" section of this report. Any analysis of the contents, even if the remaining capacity of the tank was filled with leachate from the risers, may not be representative of the leachate.

CWM indicated during the investigation that, prior to disposal, CWM conducted no additional analysis or re-evaluation of the leachate collected (apart from fingerprinting).

In summary, CWM conducted a single waste determination from each leachate collection tank approximately every two years. However, based on the current leachate collection tank configuration and management practices at each landfill and surface impoundment, any waste determination based upon leachate from the tanks may not be representative of the F039 leachate generated at the corresponding landfill or surface impoundment. CWM failed to determine if the multi-source leachate from the surface

impoundments and the landfill units met the treatment standards at the point of generation prior to treatment, dilution or disposal.

AON #2A: Impermissible Dilution of Hazardous Waste

Note: For purposes of this investigation report, AON #2 as identified in the attached 2007 NEIC report (see Attachment #2) is broken out into AON #2A and AON #2B.

*Issue identified in the NEIC Report*

Pursuant to 22 CCR § 66268.3(a) [40 CFR § 268.3(a)], a restricted waste shall not be diluted as a substitute for adequate treatment to achieve compliance with subpart D of this part.

NEIC contended that CWM conducted impermissible dilution as a substitute for adequate treatment for the F039 leachate generated on-site.

NEIC documented that F039 leachate is aggregated in open-top tanks prior to being discharged to the surface impoundments or shipped off-site for incineration. NEIC identified that WDR analytical records showed that F039 leachate did not meet the treatment standards at the point of generation. Most F039 leachate at the facility is disposed of in a surface impoundment.

Specifically, the 2007 NEIC report (see page 29 of Attachment #2) included a table which showed instances from 2001 – 2004 where the analytical results for the leachate from the riser at P-14 identified treatment standard exceedances for chloroform, an F039 constituent (see summary table below). This leachate was actively managed in an open-top leachate collection tank and subsequently discharged into on-site surface impoundments.

**P-14 Riser Chloroform Exceedances**

| Riser | Date Sampled/ Pumped to Tank | Analytical Result for chloroform (mg/L) | Treatment Standard for chloroform (mg/L) | Disposition |
|---|---|---|---|---|
| P-14 | 6/20/2001 | 0.086 | 0.046 | Pond P-14(3/4/02) |
| P-14 | 12/16/2002 | 0.092 | 0.046 | Pond P-9 (3/1/03) |
| P-14 | 12/09/2003 | 0.082 | 0.046 | Pond P-14 (12/23/03) |
| P-14 | 7/29/2004 | 0.092 | 0.046 | Pond P-9 (9/08/04) |

NEIC also documented instances when the contents of the leachate collection tank at the below two units were being shipped off-site for incineration:

- landfill B-19 Phase 2 (shipped off-site since August 14, 2003; exceeded the TS for tetrachloroethylene); and,
- surface impoundment P-16 (shipped off-site since 1995; exceeded the TS for 1,1 – dichloroethane, chloroform, tetrachloroethylene, and trichloroethylene).

*EPA 2010 Investigation - RWQCB Requirements*

The leachate from each riser is sampled annually, if possible, as part of the WDRs, permit number 98-058, imposed by the Central Valley RWQCB. Mr. Turek informed the inspectors that some of the risers may not have enough liquid in its sump to pump out during any part of the year and are therefore not sampled.

These samples are then analyzed for the WDR Constituents of Concern (COC). The inspectors noted that the COCs that are specified and analyzed under the RWQCB permit represent a portion of the constituents that can be found in F039 leachate.

An example of one of the leachate analytical reports (i.e., for the risers from P-9, P-16, and B18-1B), dated December 11, 2009, was obtained during the investigation and is included in this investigation report as Attachment #15. Subsequent to the investigation, in response to EPA's June 2010 request for information, CWM provided additional analytical reports on the leachate that were conducted in 2010.

A copy of the 2008 Annual LCRS Fluid Analysis Report, dated April 23, 2009, submitted by CWM to the RWQCB was obtained during the February 2010 investigation and is included in this investigation report as Attachment #16. This report summarizes the results from the previous ten years of WDR sampling efforts. In their response to EPA's June 2010 request for information, CWM stated that a copy of the 2009 LCRS Fluid Analysis Report, dated April 9, 2010, was provided to EPA. A copy of this 2009 report is included in this investigation report as Attachment #27.

The tables below summarize the analytical results of the annual WDR sampling for instances where F039 TS levels were exceeded. As mentioned previously, WDR samples involve analytical evaluation approximately chemical constituents, 147 of which are also F039 constituents. The first table contains the data for P-16 leachate only which is currently shipped off-site for incineration. The second table contains the data for the leachate from all of the other risers.

| WDR - Summary of Surface Impoundment P-16 Riser Leachate Analytical Results Showing TS [22 CCR § 66268.40 (40 CFR § 268.40)] Exceedances for F039 Constituents (mg/L) | | | | | | |
|---|---|---|---|---|---|---|
| Constituent [a] | 2005 | 2006 | 2007 | 2008 | 2009 | § 268.40 TS |
| 1,1-Dichloroethane | 0.430 | 0.610 | 0.260 | 0.500 | 0.590 | 0.059 |
| 1,1-Dicholroethene | 0.380 | 0.690 | 0.260 | 0.350 | 0.590 | 0.025 |
| Chloroform | 0.970 | 1.100 | 0.560 | 1.100 | 1.300 | 0.046 |
| 2-Butanone[b] | | | | | 0.520 | 0.280 |
| Acetone | | | | | 0.940 | 0.280 |
| Tetrachloroethene | 0.450 | 0.400 | 0.270 | 0.340 | 0.640 | 0.056 |
| Trichloroethene | 0.530 | 0.630 | 0.360 | 0.480 | 0.890 | 0.054 |

[a] Results originally reported in ug/L
[b] 2-butanone is also known as methyl ethyl ketone or MEK CAS 78-93-3

| WDR - Summary of Riser Leachate Analytical Results Showing TS [22 CCR § 66268.40 (40 CFR § 268.40)] Exceedances for F039 Constituents (mg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Constituent[a] | Unit/ Phase-Riser | 2005 | 2006 | 2007 | 2008 | 2009 | TS |
| Chloroform | P-14 | 0.067 | 0.053 | 0.100 | | 0.062 | 0.046 |
| Tetrachloroethene | B19-P3- Secondary | 0.220 | 0.079 | 0.073 | | 0.140 | 0.056 |
| Tetrachloroethene | B19-P3 - Vadose | | | 0.140 | | | 0.056 |
| Tetrachloroethene[c] | B19-P2 - Secondary | 0.130 | 0.170 | | | | 0.056 |
| Tetrachloroethene[c] | B19-P2 -Primary | | 0.100 | | | | 0.056 |
| Trichlorethene | B19-P2 -Primary | | 0.072 | | | | 0.054 |
| 2-Butanone [b,d] | B19-P1A-Primary | 1.700 | | | | | 0.280 |
| Acetone[d] | B19-P1A-Primary | 1.100 | | | | | 0.280 |
| 2-Butanone [b,d] | B19-P1A- Secondary | | 0.330 | | | | 0.280 |
| Phenol | B19-P1B-Vadose | | 0.040 | | | | 0.039 |
| 1,4-Dioxane | B19-P1B - Primary | | 0.210 | | 0.230 | | 0.120 |
| Tetrachloroethene | B19-P1B - Secondary | | | 0.079 | | | 0.056 |

[a] Results originally reported in ug/L
[b] 2-butanone is also known as methyl ethyl ketone or MEK CAS 78-93-3
[c] As stated in the 2007 NEIC report, at the time of the 2005 investigation, NEIC was informed that the landfill B-19 Phase 2 leachate had been shipped off-site for incineration since August 14, 2003 (see page #27, Attachment #2). However, at the time of the February 2010 EPA Region 9 investigation, no records were provided by CWM that confirmed that this was still the practice.
[d] According to facility representative, the leachate from B-19 Phase 1A was not considered to be a hazardous waste. This leachate, generated from the Class II/III landfill that overlays the closed Class I hazardous waste landfill, was not assumed to migrate through the hazardous waste portion of the landfill.

*March 2010 Sampling Event*

In March 2010, accompanied by EPA representatives, DTSC conducted a sampling event at the facility. DTSC sampled leachate from risers that contained sufficient liquid to sample and analyzed for all of the 215 chemical constituents associated with F039 waste. CWM also took samples. A summary table of the analytical results from the March 2010 sampling event is attached as Attachment #19. The units sampled included the leachate from the riser at surface impoundment P-16. The table below summarizes the constituents from DTSC's results that exceeded the TS. CWM's results identified no constituents which exceeded TS (not shown in the table). Note: The last column contains the analytical results of the annual sampling of the leachate from the P-16 riser conducted to comply with the WDRs.

**P-16 Riser Constituent Exceedances**

| Location | Constituent in Leachate March 2010 | Result (mg/L) | TS Level (mg/L) | 2009 Results for WDR purposes (mg/L) |
|---|---|---|---|---|
| P-16 Riser | 1,1, - Dichloroethene | 0.150 | 0.025 | 0.590 |
| P-16 Riser | 1,1 – Dichloroethane | 0.260 | 0.059 | 0.590 |
| P-16 Riser | Chloroform | 0.620 | 0.046 | 1.300 |
| P-16 Riser | Trichloroethene/ethylene | 0.390 | 0.054 | 0.890 |
| P-16 Riser | Tetrachloroethene/ethylene | 0.250 | 0.056 | 0.640 |

One item of interest from the above table of the leachate is that the same F039 constituents were identified during the DTSC/EPA March 2010 sampling event and the WDR sampling for COCs conducted for the 2009 Annual LCRS Fluid Analysis Report.

In addition to P-16, the results from the March 2010 sampling event at the primary riser for leachate collection tank B-18 Phase 1B, also exceeded TS. The table below summarizes the constituents from CWM results that exceeded the TS at the riser from landfill B-18 Phase 1B (March 2010 sampling event). DTSC's analytical results identified no constituents which exceeded TS (not shown in the table). Note: The last column contains the analytical results of the annual sampling of the leachate from the B-18 riser conducted to comply with the WDRs.

**B-18 Phase 1B Riser Constituent Exceedances**

| Location | Constituent in Leachate March 2010 | Result (mg/L) | TS Level (mg/L) | 2009 Results for WDR purposes (mg/L) |
|---|---|---|---|---|
| B-18 Riser | 1,1, - Dichloroethene | 0.520 | 0.025 | 0.009 |
| B-18 Riser | 1,1 – Dichloroethane | 0.420 | 0.059 | 0.004 |
| B-18 Riser | Chloroform | 0.920 | 0.046 | - |
| B-18 Riser | Trichloroethene/ethylene | 0.770 | 0.054 | 0.001 |
| B-18 Riser | Tetrachloroethene/ethylene | 0.640 | 0.056 | - |
| B-18 Riser | Methylene chloride | 0.015 | 0.089 | - |
| B-18 Riser | 1,1,2 Trichlorotrifluoroethane | 0.170 | 0.057 | - |

*EPA 2010 Investigation*

With respect to the leachate collection tanks, the inspectors observed and documented that:

- All of the tanks at the surface impoundments and landfills used to collect the F039 leachate are open-top tanks;
- All of the secondary containment systems are designed to convey any accumulated liquid (i.e. rainwater) into the associated tank. During the investigation, the inspectors also observed rainwater in the secondary containment areas of the leachate collection tanks as well as in several of the leachate collection tanks;
- Each tank is only emptied when the 90-day accumulation storage time limit nears or when the tank is reaching its maximum capacity;
- The contents of the associated riser is added to the tank at each surface impoundment; and,
- The contents of three risers (primary, secondary, and vadose) are added to each tank located at each phase of the landfills.

The inspectors also confirmed during discussions with facility representatives that CWM samples and sends off-site for analysis the leachate collected in each of the leachate collection tanks on a two-year cycle. These results are used to determine whether the leachate from each tank meets the LDR treatments standards for F039.

The inspectors were informed that if the treatment standards were met from the above-mentioned biennial testing, the leachate is routinely disposed of in one of the surface impoundments, whichever has sufficient freeboard. Furthermore, the inspectors were informed that if the leachate does not meet one or more of the treatment standards, the leachate would be shipped off-site for incineration.

CWM notified EPA in its July 2010 response to EPA's June 2010 request for information that the leachate from the leachate collection tank at P-14 is currently being treated on-site at the FSU and disposed of on-site in the hazardous waste landfill (B18). This issue will be discussed in greater detail later in this report.[1]

During the February 2010 investigation, EPA requested and obtained copies of manifests of all shipments off-site of F039 leachate generated by CWM since 2007. During the review of the records, the inspectors noted that only the F039 leachate from the P-16 leachate collection tank was shipped off-site.

However, as shown in the table above, "WDR – Summary of Riser Leachate Analytical Results Showing TS [22 CCR § 66268.40 (40 CFR § 268.40)] Exceedances for F039 Constituents (mg/L)" exceedances of several F039 constituents were identified over multiple years from risers at P-14 and B19, Phases 1B, 2, and 3.

If leachate exceeding treatment standards is being stored in the leachate collection tanks, then observations made during EPA's investigation and review of documentation provided by the facility indicate conditions for treatment of F039 by dilution at the facility from a variety of sources.[2] During the February 2010 inspection, EPA inspectors informed facility representatives that the accumulation of liquid from various sources in the leachate collection tank suggested improper dilution of leachate.

The inspectors compared the rain levels that fell in the Kettleman City area within a few months of every biennial sampling event since 2005. This rainfall information was used to calculate the potential impact of rain to each leachate collection tank. In general, the rainfall calculations are conservative in that for the majority of the calculations, only the rainfall within sixty to seventy-five days prior to the biennial sampling event were considered. In addition, the dilution percentage impact is conservative in that it assumes that the remaining capacity of the tank is taken up by leachate. A summary of the results are tabulated in the table Rainfall data and Impact to Leachate Collection Tank Systems on page 59.

[1] See section AON #2B of this investigation report.

[2] Potential input sources at the leachate collection tanks:

- leachate from a pipe connected to the primary riser;
- leachate from a pipe connected to the secondary riser (applicable to the landfill leachate collection tanks);
- leachate from a pipe connected to the vadose riser (applicable to the landfill leachate collection tanks);
- stormwater from a pipe connected to the secondary containment sump pump;
- stormwater from a pipe connected to the tertiary containment pad sump pump (applicable to the B18 Phases 1A, 1B, 2A, and 2B tanks); and,
- rainwater from above (i.e.,. since it's an open-top tank).

The table indicates that, based on the current leachate collection tank configurations and management practices, a review of the rainfall data within 90 days of several biennial sampling events suggests that the conditions exist for dilution of the contents of each leachate collection tank. If CWM is using a mixture of F039 and rain water to determine whether the leachate can be land disposed, CWM may be impermissibly diluting a restricted waste as a substitute for adequate treatment.

*Note: The dimensions of the P-9 and P-14 tanks systems used in the following table are based on the measurements of P-16 taken by the inspectors during the February 2010 investigation to verify the adequacy of the secondary containment provided for the leachate collection tanks. Mr. Henry informed the inspectors that the dimensions of the tank systems at P-9 and P14 were identical to those for P-16. The dimensions of the other tank systems were provided by CWM subsequent to the inspection.*

## Rainfall Data and Impact to Leachate Collection Tank Systems

| Unit | Sample Date | Rain Qty (in.) | Date(s) of Rain | Tank Area (open) ($ft^{2)}$ | Gallon Equiv. into Tank | 2ndry Cont. Area/Pad Minus Tank ($ft^2$) | Gallon Equiv. into 2ndry Cont./Pad | Total Gallons into Tank | Tank Capacity Minus Freeboard (gallons) | Minimum Dilution Impact |
|---|---|---|---|---|---|---|---|---|---|---|
| P-9 | 11/6/06 | 0.39 | 10/13 & 14 | 13.09 | 3.2 | 86.91 | 21.1 | 24.3 | 618 | 3.9% or 39,000 ppm |
| P-14 | 11/6/06 | 0.39 | 10/13 & 14 | 13.09 | 3.2 | 86.91 | 21.1 | 24.3 | 618 | 3.9% or 39,000 ppm |
| B18-1A | 5/5/06 | 2.07<br>1.47 | March<br>April | 78.5 | 173.2 | 569.5 | 1256.7 | 1429.9 | 5067 | 28.2% or 282,000 ppm |
| B18-1A | 6/19/08 | 0.18 | 5/25-26 | 78.5 | 8.8 | 569.5 | 63.9 | 72.7 | 5067 | 1.4% or 14,000 ppm |
| B18-1B | 3/1/06 | 0.44<br>2.07 | 2/18-19 & 2/27-28<br>March | 78.5 | 122.8 | 569.5 | 891 | 1013.8 | 5067 | 20% or 200,000 ppm |
| B18-1B | 2/20/08 | 1.07<br>2.6<br>0.26 | Dec.<br>Jan.<br>Feb. 2/20 | 78.5 | 192.3 | 569.5 | 1395 | 1587.3 | 5067 | 31.3% or 313,000 ppm |
| B18-1B | 1/11/10 | 0.2<br>1.52 | Nov.<br>Dec. | 78.5 | 84.2 | 569.5 | 610.6 | 694.8 | 5067 | 13.7% or 137,000 ppm |
| B18-2A | 5/5/06 | 2.07<br>1.47 | March<br>April | 78.5 | 173.2 | 569.5 | 1256.7 | 1429.9 | 5067 | 28.2% or 282,000 ppm |
| B18-2A | 6/19/06 | 0.18 | 5/25-26 | 78.5 | 8.8 | 569.5 | 63.9 | 72.7 | 5067 | 1.4% or 14,000 ppm |
| B18-2B | 3/1/06 | 0.44<br>2.07 | 2/18-19 & 2/27-28<br>March | 78.5 | 122.8 | 569.5 | 891 | 1013.8 | 5067 | 20% or 200,000 ppm |
| B18-2B | 2/20/08 | 1.07<br>2.6<br>0.26 | Dec.<br>Jan.<br>Feb. 2/20 | 78.5 | 192.3 | 569.5 | 1395 | 1587.3 | 5067 | 31.3% or 313,000 ppm |
| B18-2B | 1/11/10 | 0.2<br>1.52 | Nov.<br>Dec. | 78.5 | 84.2 | 569.5 | 610.6 | 694.8 | 5067 | 13.7% or 137,000 ppm |
| B19-P1B | 1/7/05 | .59<br>.23 | Pre-1/7<br>1/7 | 78.5 | 40.1 | 485.7 | 248.3 | 288.4 | 5067 | 5.7% or 57,000 ppm |
| B19-P1B | 10/13/09 | .52<br>.05 | 9/14-15<br>10/13 | 78.5 | 27.9 | 485.7 | 172.6 | 200.5 | 5067 | 4.0% or 40,000 ppm |
| B19-P2 | 4/5/05 | 1.73<br>1.34<br>.02 | Feb.<br>March<br>4/4 | 78.5 | 151.2 | 485.7 | 935.5 | 1086.7 | 5067 | 21.4% or 214,000 ppm |
| B19-P3 | 4/5/05 | 1.73<br>1.34<br>.02 | Feb.<br>March<br>4/4 | 78.5 | 151.2 | 261.5 | 503.7 | 770.4 | 5067 | 12.9% or 129,000 ppm |
| B19-P3 | 10/08/09 | .52 | 9/14-15 | 78.5 | 25.4 | 261.5 | 84.8 | 129.6 | 5067 | 2.2% or 22,000 ppm |

AON #2B: Impermissible Dilution of Cyanide Hazardous Waste

*Issue Identified in the NEIC Report*

Pursuant to 22 CCR § 66268.3(a) [40 CFR § 268.3(a)], a facility shall not in any way dilute a restricted waste as a substitute for adequate treatment to achieve compliance with treatment standards.

NEIC contended that CWM conducted impermissible dilution as a substitute for adequate treatment for wastes containing cyanide which were stabilized at the FSU.

As discussed on page 39 of the 2007 NEIC report, a stabilization recipe (developed in July 1997 and still in use at the time of the 2005 NEIC investigation) was in use for a generator's wastewater treatment sludge generated from an alodine process at the FSU. A cyanide concentration of 51.5 mg/L was identified on the profile (dated July 2, 1999). However, the generator claimed that no cyanide was used in their process.

Subsequent testing performed on the generator's sludge in June 2004 for amenable cyanide showed that the amenable cyanide exceeded the treatment standard (i.e., 30 mg/kg is the treatment standard for amenable cyanide – cyanide that can be oxidized) with a result of 35 ppm.

*EPA 2010 Investigation*

In CWM's February 26, 2010 response to the 2007 NEIC report, CWM stated that a calculation error had been made which resulted in the incorrect reporting of cyanide levels. When re-calculated, the cyanide level in the waste was determined to meet the treatment standard prior to stabilization at the FSU.

In July 2010, CWM also identified that P-14 leachate from the leachate collection tank is treated at the FSU to address cyanide and disposed onsite. EPA obtained a copy of SDP Number FSU-119 (see Attachment #20). This SDP outlines the FSU cyanide treatment process. In general, as described in this SDP, the following activities are conducted:

(1) The waste and sodium hypochlorite are mixed together;
(2) Ferrous sulfate is added to the mixture until the treatment recipe requirements are met;
(3) Cement is added; and,
(4) Waste loads with passing treatment recipes are taken directly to the landfill.

In response to EPA's June 2010 request for information (see Attachment #22), CWM provided information on the management of leachate from surface impoundment P-14 (see Attachment #23). In summary, CWM stated:

- *...analytical results from the 2008 [P-14 leachate] profile recertification sampling showed that the leachate exceeded TS for cyanide only. The profile was updated to reflect this exceedance and leachate collected in the tank was sent to the FSU for stabilization prior to its disposal in Landfill B-18. [page 10]*

- *If leachate from P-14 does not meet LDR treatment standards, it is treated in the Final Stabilization Unit (FSU) before it is disposed of in Landfill B-18. [page 6]*
- *…KHF developed a treatment method for P14T leachate pursuant to its Waste Analysis Plan. [page 10]*
- *This leachate is stabilized using an established treatment method (specific in the waste profile) to meet applicable LDR treatment standards. [page 6]*
- *KHF conducts a post-treatment analysis program to ensure that the stabilization process is effective in meeting the treatment standards. [page 6]*
- *Until a different profile is generated for P14T, the leachate will continue to be treated in the FSU prior to disposal. [page 10]*

During a conference call between representatives of CWM and EPA on December 8, 2010, the following clarifying information about CWM's treatment of cyanide was provided:

- Between 2008 and 2010, the leachate from P-14 was treated at the FSU on three occasions.
- During the development of the treatment process, bleach [redacted] ferrous sulfate, and fly ash (from the petroleum industry) were used.
  - The treated samples were not tested after the addition of the bleach.
  - The treated samples were tested after completion of the treatment process.
- The treatment of the leachate from P-14 at the FSU takes approximately [redacted].
  - The F039 leachate is added to one of the four mixing tanks at the FSU.
  - Bleach is added to the waste and the solution is mixed for approximately [redacted].
  - Ferrous sulfate is then added to the waste and the solution is mixed for approximately [redacted].
  - Ash is then added to the waste and the waste is mixed for approximately [redacted]
- Post-treatment confirmation analysis was conducted on the treated waste by an off-site laboratory.
- Ferrous sulfate was used only during the first of the three treatment events.

Stabilization is not an appropriate method of treatment for cyanide for LDR compliance. Stabilization of cyanide is considered to be impermissible dilution by EPA. It reduces the leachability of the cyanide, but does not destroy it. The Best Demonstrated Available Technology for cyanide is alkaline chlorination which destroys the cyanide constituents and converts the cyanides to carbon dioxide and nitrogen. [RCRA Online Number 11545 (July 31, 1990)]

AON #3: Treatment of Hazardous Constituents by Evaporation in the Surface Impoundment

*Issue Identified in the NEIC Report*

The 2007 NEIC report pointed out that, pursuant to 40 CFR § 268.4(b), evaporation of hazardous constituents as the principal means of treatment is not considered to be treatment for purposes of an exemption for surface impoundments. However, under California's federally authorized hazardous waste management program, evaporation of hazardous constituents as the principal means of treatment to meet LDR requirements is prohibited.

NEIC documented that CWM's April 2002 analytical results for "pond skimmings" from surface impoundment P-16 identified concentrations of organic constituents above the TS (see Attachment N of the NEIC report which is included as part of Attachment #2). The table below summarizes the constituents which exceeded the TS.

**P-16 "Pond Skimmings" Constituent Exceedances**

| Constituent in Leachate Exceeding TS | Result (mg/L) | TS Level (mg/L) |
|---|---|---|
| Acetone | 29.000 | 0.280 |
| Ethyl benzene | 0.360 | 0.057 |
| Toluene | 0.520 | 0.080 |
| Xylenes (total) | 1.900 | 0.320 |
| Diethyl phthalate | 21.000 | 0.200 |
| Phenol | 61.000 | 0.039 |

*EPA 2010 Investigation*

As previously discussed in this investigation report, several types of waste are placed into the surface impoundments (i.e., P-9, P-14, or P-16). These wastes include the leachate from the majority of the on-site leachate collection tanks and waste meeting the treatment standards from off-site generators. Under CWM's Hazardous Waste Permit, the wastes going into the surface impoundment are not to exceed treatment standards.

As described earlier in this report, the generator's analytical results and profile are used to determine whether a particular waste can be added to the surface impoundments. These profiles are maintained by CWM and updated at a maximum frequency of every 24 months.[3]

According to CWM-KHF personnel, an incoming liquid load (e.g. bulk shipments or contents of containers removed at the DSU by a vacuum truck) going to the surface impoundments undergoes mandatory fingerprint testing[4] and is also subject to a compatibility

[3] See section 4.4 "*Waste Profile Re-evaluation*" of the WAP
[4] See section 3.1 "*Mandatory Analyses*" of the WAP. These tests provide a general identification of the waste and indicate the type of treatment, storage, and/or disposal that is most suitable. These procedures are: physical description, water compatibility, pH screening, flammability potential screening, cyanides screening, sulfides screening, and oxidizer screening.

test (as deemed necessary).[5] In the compatibility test, a sample of the incoming liquid waste is mixed with a sample of liquid from the destination surface impoundment and monitored for a reaction. The waste is also checked for the presence of visible oil and grease. After the approval is given by the receiving technicians, an incoming load of off-site liquids is typically off-loaded by the driver.

The inspectors were informed that whenever an oily sheen was observed on the surface of P-16, the skimmings were removed from the impoundment, containerized into 55-gallon containers, taken to the DSU, and shipped off-site for incineration. These skimmings were identified as "F039, Surface Impoundment Skimmings" on the manifests. Based on analytical results from 2002, facility representatives handle the P-16 pond skimmings as F039 hazardous waste. During the February 2010 investigation, the inspectors did not observe an oily sheen or other visible material on the surface of any surface impoundment.

The following table includes the dates of the document packets (which includes Off-Site Shipment Compliance Checklists, Site Transfer Logs, Certificates of Destruction, and Manifest for F039) related to off-site shipments of P-16 pond skimmings provided to EPA in February 2010. Copies of these documents are included as Attachment #25 of this investigation report.

**P-16 "Pond Skimmings" Shipments**

| Manifest Shipment Date | F039 / P-16 Pond Skimmings |
|---|---|
| August 27, 2002 [8-27-02] | 7 drums - 385 gallons/3,080 lbs |
| April 30, 2003 [4-30-03] | 7 drums - 385 gallons/3,080 lbs |
| June 20, 2006 [6-20-06] | 3 drums - 165 gallons/1,320 lbs |
| October 2, 2006 [10-2-06] | 3 drums - 165 gallons/1,320 lbs |
| April 25, 2008 [4-25-08] | 2 drums – 110 gallons/880 lbs |

CWM-KHF representatives stated that since the 2002 sampling event, no sampling of the liquid in or materials removed from surface impoundment P-16 has occurred. Additionally, no sampling and testing of the other surface impoundments was performed.

In March 2010, representatives of DTSC and CWM-KHF, with the participation of EPA representatives, obtained and split samples taken from the liquid in surface impoundment P-16. The samples were analyzed for all 215 of the F039 chemical constituents. A summary of the underlying hazardous constituents (UHC) which were identified as exceeding the TS are provided in the following table.

**Constituent Exceedances at P-16 From March 2010 Sampling Event**

| Constituent | EPA/DTSC Result (mg/L) | CWM Result (mg/L) | F039 TS level (mg/L) |
|---|---|---|---|
| Acetone (estimate) | 0.470 | 0.910 | 0.280 |
| Acenaphthalene | 0.170 | | 0.059 |
| Phenol | 0.170 | 0.230 | 0.039 |

[5] Covered in section 6.2.5 "*Solar Evaporation*" of the WAP.

During the March 2010 sampling event, samples were also taken of the sludge in surface impoundment P-16. No exceedances of organic constituents were identified by either DTSC's or CWM's analytical results of the sludge.

AON #5 - Failure to Test Treatment Residues in Accordance with EPA Methods

*Issue Identified in the NEIC Report*

Pursuant to 22 CCR § 66268.7(b)(1) [40 CFR § 268.7(b)(1)], treatment facilities must test their wastes in accordance with the requirements provided in this section. Pursuant to paragraph (b)(1), for wastes with treatment standards expressed in the waste extract (TCLP), the facility must test an extract of the treatment residues, using test method 1311 (the Toxicity Characteristic Leaching Procedure, described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846 as incorporated by reference in 260.11 of this chapter) to assure that the treatment residues extract meet the applicable treatment standards.

The 2007 NEIC report stated that the CWM laboratory used Inductively Coupled Plasma Emission Spectrometry to analyze TCLP extracts to determine whether the waste treated on-site met UTS. During the 2005 inspection, NEIC observed and evaluated CWM's laboratory activities and identified that the CWM laboratory did not evaluate or correct for spectral interferences or perform required background corrections, which could result in false positive or negative results.

In CWM's February 26, 2010 response to the NEIC Report, CWM certified that it corrected this issued in December 2005/January 2006.

*EPA 2010 Investigation*

Attachment #26 contains a selection of laboratory data submitted by CWM in response to EPA's July 2010 request for information.

As stated in section 6.2 Treatment Operations of the WAP, the treated wastes destined for land disposal "…"*will be sampled and analyzed based on applicable RCRA code, code group, analytical parameter or profile designation to demonstrate the treatment process is effective."* This section also states that the treated wastes shall comply with the LDR performance treatment standards in accordance with the regulations in 22 CCR Chapter 18 [40 CFR Part 268].

Additionally, section 7.0 Quality Assurance/Quality Control of the WAP states that the facility's quality assurance and quality control information required by 22 CCR § 66270.30(e) [40 CFR § 270.30(e)] and "*…and in accordance with the following EPA guidance documents:… Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, Third Edition, Final Update I, U.S. EPA, Office of Solid Waste, Washington, DC, July 1992, Chapter One…*" is provided in this section. This section also states that these quality procedures are *"…applicable to both sampling procedures and analytical techniques.*"

Pursuant to 22 CCR § 66270.30(e), the facility is required to "*properly operate and maintain*" all facilities and systems of treatment and control. Proper operation and maintenance includes *"...adequate laboratory and process controls, including appropriate quality assurance procedures. ...*"

As stated in section 3.0 Analytical Rationale of the WAP, "*Analytical parameters and the rationale for their use are provided below and test procedures are provided in Appendix WAP-B*." This section continues by adding, *"...The techniques used for these parameters are as follows: Among those listed in Appendix WAP-B*"

Appendix WAP – B Analytical Procedures, section 2 Standard Analytical Procedures of the WAP includes "…*Elemental Analytical Methods - Inductively coupled plasma atomic emission spectroscopy (ICP) 1/6010B*".

Laboratory data submitted by CWM in response to EPA's July 2010 request for information depicted instances where the KHF laboratory failed to comply with the calibration verification requirements in EPA Publication SW-846, Method 6010B. EPA identified instances where CWM continued with sample analyses when the initial calibration verification (ICV) or continuing calibration verification (CCV) failed. Method 6010B requires that you discontinue the analysis if the calibration cannot be verified.

Section 7.4 of SW-846 Method 6010B, Inductively Coupled Plasma – Atomic Emission Spectrometry, requires that the laboratory discontinue the sample analysis if the initial calibration verification (ICV) or continuing calibration verification (CCV) cannot be verified as required. Section 8.6.1.1 requires that the laboratory terminate the sample analysis, correct the problem, and recalibrate the instrument, if the results of the ICV and CCV do not agree within 10% of the expected value. The CWM-KHF laboratory did not always discontinue sample analyses when the calibration failed.

For example, for STE 070131, Method 6010B, the antimony ICV was found to be 2.35 ppm when the true value is 5.0 ppm, for a recovery of 47%. Section 7.4 of EPA Method 6010B states that when the ICV fails (less than 90% recovery) all samples must be reanalyzed. In the case of this analysis, instead of reanalyzing, CWM prepared a different quality control standard CWM called antimony ICV. This new ICV standard was analyzed (after the initial standard failed ICV). This new ICV standard had a recovery of 84.2% which still failed the ICV acceptance criteria (i.e., 90% recovery). Subsequently, the antimony ICV was reanalyzed and found to have a recovery of 90.4%. The analytical report used only the passing 90.4% result and ignored the first result and the confirming result which indicate that there are quality control problems for antimony. Since the ICV did not pass, the associated analytical results are not valid. CWM neither corrected the problem nor recalibrated the instrument.

As another example, for STE 071025, Method 6010B, the antimony ICV was found to be 2.51 ppm when the true value is 5.0 ppm, for a recovery of 50%. In this case, instead of reanalyzing, the lab manager decided that "no STEs coded for thallium or antimony will be released" as stated in the QC checklist for the data package.

These examples illustrate a practice to ignore quality control failures based on procedures not described in Method 6010B.

Additionally, as stated in section 1.2 of Method 6010B, "…Elements and matrices other than those listed in Table 1 may be analyzed by this method if performance at the concentration levels of interest (see Section 8.0) is demonstrated." Table 1 lists performance data for clean aqueous matrices. CWM can use this method for analysis of complex samples such as TCLP extracts of hazardous wastes if they can demonstrate performance quality control accuracy at the concentration levels of interest (i.e., UTS).

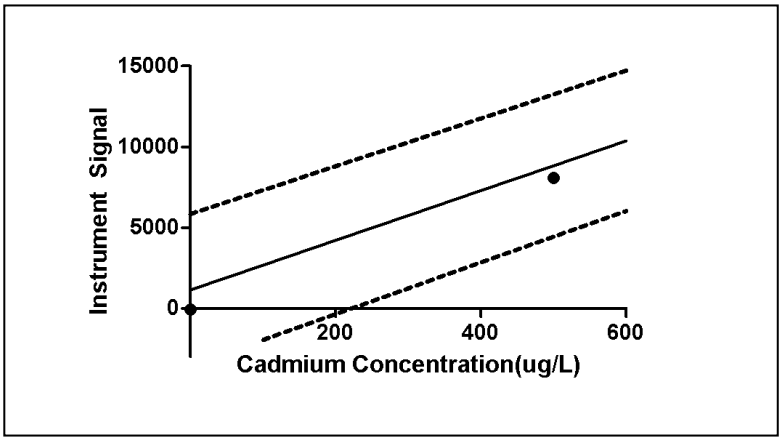
For example, for sample 6061-16 (in STE 060303) CWM reports cadmium as 0.10 ppm (100 ppb). The UTS is 0.11 ppm (110 ppb). Thus, the performance criteria in section 8.0 must be demonstrated at concentrations near 0.11 ppm (110 ppb). However, CWM did not analyze any quality control samples near this concentration. The ICV concentration was set at 5.0 ppm (5000 ppb). EPA determined that blank concentrations (which should be 0 ppb) were the closest concentration QC samples used by CWM. EPA evaluated the blank results and found that CWM reported clean water with no cadmium at -0.07 ppm (-70 ppb). This result shows a significant low bias relative to the UTS value of 0.11 ppm (110 ppb). Therefore, the sample result would be reported lower than the actual concentration.

Section 8.6.1.3 of Method 6010B states that "The results of the calibration blank are to agree within three times the IDL. If not, repeat the analysis two more times and average the results. If the average is not within three standard deviations of the background mean, terminate the analysis, correct the problem, recalibrate, and reanalyze the previous 10 samples." As shown by the above example for cadmium, CWM did not follow this requirement.

Section 8.6.1.3 of Method 6010B continues by stating "If the blank is less than 1/10 the concentration of the action level of interest, and no sample is within ten percent of the action limit, analyses need not be rerun and recalibration need not be performed before continuation of the run." For the above example for cadmium, this means that if the blank was less than plus or minus .011 ppm (11 ppb), CWM could have considered the blank result as acceptable. However, the cadmium result was determined to be -0.07 ppm (-70 ppb).

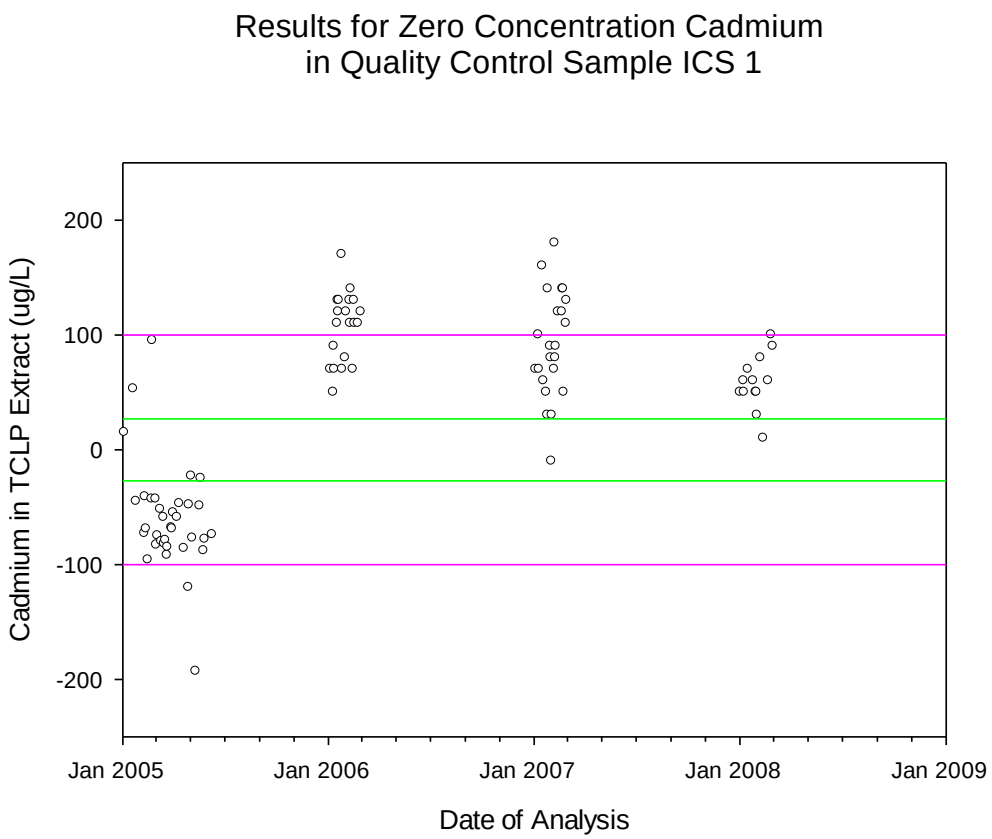
The figure below, based on the calibration used to report sample 6061-16, illustrates how this discrepancy results in waste being determined to meet UTS when it actually exceeds UTS. Specifically, it depicts a significant negative bias at the UTS concentration. A clean water sample (no cadmium instrument signal) would be reported as a negative concentration, unless the water was spiked to have a concentration of 70 ppb cadmium. This is analogous to weighing something on a scale that has been dialed back.

**95% Confidence Interval for Cadmium Calibration With Expanded Scale Around the Decision Point of 110 ug/L**




EPA reviewed selected data provided by CWM, including all the data for the year 2005 and data for the months of January and February for years 2006 through 2008. Data for the years 2009 and 2010 could not be displayed because the CWM laboratory modified the ICS 1 sample concentrations in these years.

The graph on the following page "Results for Zero Concentration Cadmium in Quality Control Sample ICS 1" illustrates the correction accuracy applied by the CWM laboratory to a zero concentration cadmium in, a quality control standard (ICS 1) that verifies the accuracy of the correction factors. The green lines represent the upper and lower bounds for acceptable performance determined by EPA. The pink lines represent the upper and lower control limits used by the CWM-KHF Laboratory to determine acceptable performance. Notwithstanding this control limit disagreement, the graph depicts many results which exceed both EPA and CWM criteria. As shown in the graph, the ICS 1 quality control results confirm that the failure to accurately calibrate and maintain calibration of the interference corrections is adversely affecting the accuracy of cadmium sample results.




Additionally, the table below summarizes CWM's own internal review of the acceptability of the ICV, ICS 1, and ICS 2 results. As previously described, failure of any of these critical quality control samples indicates that the data is not acceptable and corrective action must be taken. There were no correctives actions in response to any of the CWM self-identified failures. All of the associated sample data for TCLP extracts of hazardous waste were used to make waste management decisions for land disposal.

The CWM self-reported evaluations presented in the below table represent only analyses performed during the months of January and February of years 2006 - 2010. Based on this sampling of the CWM records, 80% of the analyses in 2006, 95% of the analyses in 2007, 66% of the analyses in 2008, 100% of the analyses in 2009, and 100% of the analyses in 2010 had several quality control failures that were not corrected.

**Summary of Limited Sampling of CWM Internal Review Results for Critical QC Samples ICS 1, ICS 2, and ICS (January and February Analyses from 2006 - 2010)**

| STE Number | CWM Self Reported Evaluation | | |
|---|---|---|---|
| | ICS1 Evaluation | ICS2 Evaluation | ICV Evaluation |
| STE 060105 | Pass | Pass | Pass |
| STE 060110 | Pass | Fail | Pass |
| STE 060111 | Fail | Fail | Fail |
| STE 060112 | Pass | Fail | Fail |
| STE 060117 | Fail | Pass | Pass |
| STE 060118 | Fail | Fail | Pass |
| STE 060119 | Fail | Fail | Pass |
| STE 060120 | Fail | Pass | Pass |
| STE 060125 | Fail | Fail | Fail |
| STE 060126 | Pass | Fail | Fail |
| STE 060131 | Fail | Fail | Fail |
| STE 060202 | Fail | Fail | Pass |
| STE 060208 | Fail | Fail | Pass |
| STE 060209 | Fail | Fail | Pass |
| STE 060210 | Fail | Pass | Pass |
| STE 060214 | Pass | Fail | Fail |
| STE 060216 | Fail | Fail | Pass |
| STE 060217 | Fail | Fail | Pass |
| STE 060223 | Fail | Fail | Fail |
| STE 060228 | Fail | Fail | Fail |
| STE 070104 | Pass | Pass | Fail |
| STE 070109 | Pass | Pass | Fail |
| STE 070110 | Fail | Pass | Fail |
| STE 070116 | Fail | Fail | Fail |
| STE 070118 | Pass | Pass | Fail |
| STE 070123 | Pass | Pass | Fail |
| STE 070125 | Fail | Pass | Fail |
| STE 070126 | Fail | Fail | Fail |
| STE 070130 | Pass | Pass | Fail |
| STE 070131 | Fail | Pass | Fail |
| STE 070201 | Fail | Fail | Fail |
| STE 070202 | Pass | Pass | Pass |
| STE 070206 | Fail | Fail | Pass |
| STE 070207 | Fail | Fail | Pass |
| STE 070208 | Pass | Fail | Pass |
| STE 070209 | Pass | Fail | Pass |
| STE 070213 | Fail | Fail | Pass |
| STE 070220 | Fail | Fail | Pass |
| STE 070221 | Fail | Fail | Pass |

| | | | |
|---|---|---|---|
| STE 070222 | Fail | Fail | Pass |
| STE 070223 | Pass | Fail | Pass |
| STE 070227 | Fail | Fail | Pass |
| STE 070228 | Fail | Fail | Pass |
| STE 080102 | Pass | Fail | Fail |
| STE 080108 | Pass | Fail | Fail |
| STE 080109 | Pass | Fail | Pass |
| STE 080116 | Pass | Fail | Pass |
| STE 080125 | Fail | Pass | Pass |
| STE 080130 | Pass | Pass | Fail |
| STE 080131 | Pass | Pass | Pass |
| STE 080201 | Pass | Pass | Pass |
| STE 080207 | Pass | Fail | Pass |
| STE 080212 | Fail | Pass | Pass |
| STE 080221 | Fail | Pass | Fail |
| STE 080226 | Pass | Fail | Fail |
| STE 080229 | Fail | Pass | Fail |
| STE 090106 | Pass | Fail | Pass |
| STE 090109 | Fail | Fail | Pass |
| STE 090114 | Pass | Fail | Fail |
| STE 090116 | Fail | Fail | Pass |
| STE 090122 | Pass | Fail | Pass |
| STE 090127 | Pass | Fail | Pass |
| STE 090205 | Pass | Fail | Pass |
| STE 090211 | Pass | Fail | Pass |
| STE 090217 | Fail | Fail | Pass |
| STE 090225 | Pass | Fail | Pass |
| STE 100105 | Fail | Fail | Pass |
| STE 100107 | Fail | Fail | Pass |
| STE 100114 | Fail | Fail | Fail |
| STE 100122 | Fail | Fail | Fail |
| STE 100128 | Fail | Fail | Pass |
| STE 100204 | Pass | Fail | Fail |
| STE 100205 | Pass | Fail | Fail |
| STE 100210 | Pass | Fail | Pass |
| STE 100219 | Pass | Fail | Fail |
| STE 100225 | Fail | Fail | Fail |

In summary, in accordance with the requirements outlined in Method 6010B, if the calibration cannot be verified within the specified limits the sample analysis must be discontinued, the cause determined and the instrument recalibrated. All samples following the last acceptable ICV, CCV or check standard must be reanalyzed. CWM's laboratory did not follow these requirements.

**POTENTIAL VIOLATIONS ("PV")**

PV #1: Failure to Determine Whether a Hazardous Waste [F039] Meets the Land Disposal Treatment Standards Prior to Land Disposal

**22 CCR § 66268.7(a)(1)** [40 CFR § 268.7(a)(1)]

*(a) Requirements for generators:*

*(1) A generator of hazardous waste shall determine if the waste has to be treated before it can be land disposed. This is done by determining if the hazardous waste meets the treatment standards . . . .*

Findings: The facility generated F039 leachate from Phases 1B, 2, and 3 of Landfill B-19 that exceed TS. The F039 leachate from these units is disposed in surface impoundments at the facility. CWM disposed of F039 leachate collected from Phases 1B, 2, and 3 of Landfill B-19 approximately every 90 days, but only tested the F039 leachate from Phases 1B, 2, and 3 of Landfill B-19 to determine whether the wastes met treatment standards every 24 months. Annual WDR analytical results from sampling at the risers show that the F039 leachate from Phases 1B, 2, and 3 of Landfill B-19 did not always meet treatment standards. Thus, CWM land disposed of untreated F039 leachate from Phases 1B, 2, and 3 of Landfill B-19 approximately every 90 days without determining whether the waste met treatment standards.

The facility generates F039 leachate from surface impoundment P-14 that exceeds TS. The F039 leachate from this unit was disposed of in surface impoundments from 2005 through 2007. CWM disposed of F039 leachate collected from P-14 approximately every 90 days, but only tested the F039 leachate from P-14 to determine whether the waste met treatment standards every two years. Annual WDR analytical results show that the F039 leachate from P-14 did not always meet treatment standards. Thus, CWM land disposed untreated F039 leachate approximately every 90 days from P-14 from 2005 through 2007 without determining whether the waste met treatment standards.

PV #2: Impermissible Land Disposal of Prohibited Waste

**22 CCR § 66268.40(e)** [40 CFR § 268.40(e)]

*(e) For characteristic wastes (D001 – D043) that are subject to treatment standards in the following table "Treatment Standards for Hazardous Wastes," and are not managed in a wastewater treatment system that is regulated under the federal Clean Water Act (CWA), that is federal CWA-equivalent, or that is injected into a Class I nonhazardous deep injection well, all underlying hazardous constituents (as defined in section 66260.10) shall meet Universal Treatment Standards, found in section 66268.48, Table Universal Treatment Standards, prior to land disposal as defined in section 66268.10 of this division.*

**22 CCR § 66268.48(a) [***40 CFR § 268.48(a)] Universal Treatment Standard*

*(a) Table UTS identifies the hazardous constituents, along with the nonwastewater and wastewater treatment standard levels, that are used to regulate most prohibited hazardous wastes with numerical limits. For determining compliance with treatment standards for underlying hazardous constituents as defined in section 66260.10 [§268.2(i)], these treatment standards may not be exceeded…*

Findings: The facility disposed of prohibited wastes (wastes generated onsite and customers' wastes) that did not meet treatment standards. On November 11, 2010, in response to a RCRA section 3007 request for information, CWM disclosed that between January 1, 2005 and July 23, 2010, CWM land disposed of prohibited wastes that did not meet treatment standards, as summarized in the table titled, "Waste Excavated From Landfill B-18 From 2005 – 2010" in the Records Review section of this report. CWM subsequently excavated those wastes.

EPA's review of CWM's laboratory records further show that CWM land disposed of prohibited wastes that did not fully meet treatment standards, as summarized in the table titled, "Examples of UTS Exceedances Identified From CWM Laboratory Records" in the Records Review section of this report.

PV #3: Failure to Comply with Hazardous Waste Permit – Non-Compliance with EPA Method 6010B

**22 CCR § 66270.30** [40 CFR § 270.30]

*The following conditions apply to all permits.*

*(a) Duty to comply. The permittee shall comply with all conditions of this permit, except that the permittee need not comply with the conditions of this permit to the extent and for the duration such noncompliance is authorized in an emergency permit. (See section 66270.61). Any permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the appropriate statute or regulation and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.*

*(e) Proper operation and maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.*

**22 CCR § 66264.13** [40 CFR § 264.13]

*(a)(1) Before an owner or operator transfers, treats, stores, or disposes of any hazardous waste, or nonhazardous waste if applicable under section 66264.113(d), the owner or operator shall obtain a detailed chemical and physical analysis of a representative sample of the waste. At a minimum, this analysis shall contain all the information which must be known to transfer, treat, store, or dispose of the waste in accordance with the requirements of this chapter and chapter 18* [land disposal restrictions] *of this division and with the conditions of a permit issued under chapter 20 and chapter 21 of this division.*

**Hazardous Waste Permit - Waste Analysis Plan (WAP)**

Section 7.0 Quality Assurance/Quality Control of the WAP states that the facility's quality assurance and quality control information required by 22 CCR § 66270.30(e) [40 CFR § 270.30(e)] and "*…and in accordance with the following EPA guidance documents:… Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, Third Edition, Final Update I, U.S. EPA, Office of Solid Waste, Washington, DC, July 1992, Chapter One…*" is provided in this section. This section also states that these quality procedures are *"…applicable to both sampling procedures and analytical techniques.*"

Findings: The appendix to section 3 of WAP specifies utilization of Method 6010B. CWM failed to follow the requirements of Method 6010B as specified in the WAP in the Permit. Section 7.4 of SW-846 Method 6010B, Inductively Coupled Plasma – Atomic Emission Spectrometry, requires that the laboratory discontinue the sample analysis if the initial calibration verification (ICV) or continuing calibration verification (CCV) cannot be verified as required. Section 8.6.1.1 requires that the laboratory terminate the sample analysis, correct the problem, and recalibrate the instrument, if the results of the ICV and CCV do not agree within 10% of the expected value. The CWM-KHF laboratory did not always discontinue sample analyses when the calibration failed. See examples of calibration failures on the "Summary of Limited Sampling of CWM Internal Review Results for Critical QC Samples ICS 1, ICS 2, and ICS (January and February Analyses from 2006-2010)" table in the Record Review section of this report.

Section 8.6.1.3 of Method 6010B states, "The results of the calibration blank are to agree within three times the IDL. If not, repeat the analysis two more times and average the results. If the average is not within three standard deviations of the background mean, terminate the analysis, correct the problem, recalibrate, and reanalyze the previous 10 samples." As discussed in the report, CWM did not follow this requirement for cadmium.

Section 8.6.1.3 of Method 6010B also states, "If the blank is less than 1/10 the concentration of the action level of interest, and no sample is within ten percent of the action limit, analyses need not be rerun and recalibration need not be performed before continuation of the run." For the cadmium example presented in the report, this means that if the blank was less than plus or minus 0.011 ppm (11 ppb), CWM could have considered the blank result as acceptable. However, the cadmium result was determined to be -0.07 ppm (-70 ppb).

PV #4: Open Containers

***22 CCR § 66264.173(a)*** *[40 CFR § 264.173(a)]*

*(a) A container holding hazardous waste shall always be closed during transfer and storage, except when it is necessary to add or remove waste [referenced by 22 CCR § 66262.34(a)(1) and (e)(1)(D) (40 CFR § 262.34(a)(1)(i) and (c)(1)(i))]*

Findings: At the DSU, in G-Cell, the inspectors observed:

- two containers of universal waste lamps that were left open; and,
- one open tote container filled with miscellaneous universal waste lamps which contained several lamps that were not in a closed container.

Facility Responses: The above issues were corrected by CWM representatives during the investigation.

PV #5: Maintenance and Operation of Facility

***22 CCR § 66264.31*** *[40 CFR § 264.31]*

*Facilities shall be maintained and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.*

Findings: At the DSU, in G-Cell, the inspectors observed that the lamp in one of the containers was broken and a small amount glass was observed on the floor underneath the container.

Facility Response: The above issue was corrected by CWM representatives during the investigation.

**CALIFORNIA-ONLY POTENTIAL VIOLATION ("CPV")**

CPV #1: Design and Operation of Facility

*CWM Permit (# 02-SAC-03), Attachment A, Part III (General Conditions), Section 2 (Effect of Permit), Subsection (A)*

> *The Permittee shall comply with the provisions of the California Health and Safety Code, and Cal. Code of Regs., title 22, division 4.5. The issuance of this Permit by DTSC does not release the Permittee from any liability or duty imposed by federal or state statutes or regulations or local ordinances, except the obligation to obtain this Permit.*
>
> *22 CCR §66264.31 (Design and Operation of Facility)*
>
> > *Facilities shall be located, designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.*

Findings: The inspectors observed the following issues at the DSU:

- one 55-gallon container filled with non-RCRA oily water that had an open bung in B-Cell;
- several open bulk containers of electrical equipment which were filled with non-RCRA hazardous waste oil in G-Cell. Several containers had liquid in the bottom and oily sheens on the equipment indicating possible equipment leaks; and,
- one 55-gallon drum of non-RCRA hazardous waste (used oil) which had a small amount of yellowish liquid on the top of the drum cover in H-Cell.

Facility Responses: The above issues were corrected by CWM representatives during the investigation.

CPV #2: Labeling/Marking -- Universal Waste Lamp

***22 CCR § 66273.34(c)***

*(c) Lamps (including M003 wastes that contain lamps) (i.e., each lamp), or a container or package in which the lamps are contained, shall be labeled or marked clearly with the following phrase: "Universal Waste-Lamp(s)".*

Findings: At the DSU, in G-Cell, the inspectors observed four containers of universal waste lamps that were not marked with the words “universal waste – lamps” as required.

Facility Response: The above issue was corrected by CWM representatives during the investigation.

**AREAS OF CONCERN**

#1: Dilution in Open Top 90-Day Hazardous Waste Storage Tanks

As documented in this report, observations made during EPA's investigation and review of documentation provided by the facility, indicate the possibility of treatment of the F039 by dilution at the facility from a variety of sources.

One possible source included rain which could enter the tank directly (since the leachate collection tanks are open top tanks) or could be pumped in from the secondary containment system. The inspectors compared the rain levels that fell in the Kettleman City area within a few months of every biennial sampling event since 2005. This rainfall information was used to calculate the conservative potential impact of the rain to each leachate collection tank.

During the February 2010 inspection, EPA inspectors informed facility representatives that the accumulation of liquid from various sources in the leachate collection tank suggested improper dilution of leachate.

#2: Surface Impoundment P-16 Contains Waste That Exceeds Treatment Standards

CWM and DTSC analytical results from a March 2010 sampling event of the liquid in surface impoundment P-16 show that P-16 contains liquid that exceeds the TS for acetone, phenol and acenaphthalene. Furthermore, CWM's April 2002 analytical results for "pond skimmings" from surface impoundment P-16 also identified constituents above the TS. Such constituents included acetone, phenol, ethyl benzene, toluene, xylenes, and diethyl phthalate. Although EPA's investigation did not document that restricted wastes were placed in P-16, samples of the skimming and liquid waste in P-16 show exceedence of treatment standards. These results raise concerns about monitoring P-16 to ensure proper management of P-16 waste during operation and during closure.

#3: Treatment of F039 Leachate From Surface Impoundment P-14 for Cyanide

During the investigation, EPA looked further at CWM's cyanide treatment.

Based on the information obtained from CWM, EPA determined:

- CWM did not verify that the addition of bleach [redacted] in the bench scale test was adequate to destroy the cyanide in the F039 leachate (i.e., the treated sample was not tested prior to any further treatment).

- Ferrous sulfate would bind to the cyanide and form iron cyanide (i.e., the cyanide is stabilized, but not destroyed). Alkaline chlorination is not effective for cyanides in iron complexes. Therefore, any cyanide that was not destroyed prior to the addition of the ferrous sulfate (approximately [redacted] after the addition of bleach) and converted to iron cyanide would not be destroyed by the bleach.

Based on the above information, whether CWM is achieving successful treatment of the cyanide cannot be determined. CWM's treatment of the F039 leachate from surface impoundment P-14 at the FSU from 2008-2010 may have resulted in the dilution rather than the destruction of the cyanide.

**ATTACHMENTS**

1. DTSC Inspection Report of September 15-16, 2009 Inspection.
2. 2007 Report of the Multimedia Compliance Investigation Conducted by NEIC from December 5 – 16, 2005[6]
3. Map of the CWM Kettleman City Facility
4. Refresher Training Records
5. Tank Certification Records
6. Single-Walled Ancillary Equipment Testing Memo, dated November 19, 2009
7. Examples of Modified Checklists
8. Outgoing F039 Manifests since 2007
9. Photograph Log of photographs taken on an Olympus Stylus Tough-6000 digital camera
10. Photographs identified in Attachment #9
11. Photograph Log of photographs taken on an Olympus Stylus 770SW digital camera
12. Photographs identified in Attachment #11
13. Leachate Removal Procedure, SDP Number ET-201
14. Leachate Tank Sampling, SDP Number ET-202
15. Analytical report on the leachate from P-9, P-16, and B18-1B, dated December 11, 2009
16. 2008 Annual LCRS Fluid Analysis Report, dated April 23, 2009
17. Daily Inspection Record for January 24, 2010
18. Analytical Results from March 1-2, 2010 Sampling Event at CWM by DTSC and EPA
19. Summary Table of Results from March 2010 Sampling Event at CWM by DTSC and EPA
20. FSU Treatment Process, SDP Number FSU-119

[6] Document contains confidential business information (CBI). Attached document has been redacted.

21. EPA Request for Information to CWM, dated July 23, 2010

22. EPA Request for Information to CWM, dated June 4, 2010

23. CWM's Response Letter, dated July 26, 2010, to EPA's June 2010 Request for Information[7]

24. Selection of Laboratory Data Submitted by CWM in Response to EPA's July 2010 Request for Information [8]

25. Document Packets for Off-site Shipments of P-16 Pond Skimmings

26. Applicable Laboratory Data Submitted by CWM in Response to EPA's July 2010 Request for Information [9]

27. 2009 Annual LCRS Fluid Analysis Report, dated April 9, 2010

[7] Document contains CBI. CBI portions have been removed.
[8] Document contains CBI. CBI portions have been removed.
[9] Document contains CBI. CBI portions have been removed.