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Revised Combined Five-Year Review Report American Standard Products Site

14 August 2012



Prepared for

Ingersoll Rand

One Centennial Avenue
Piscataway, NJ 08854

K/J Project No. 980007*06

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Section 1: Introduction

This Combined Five-Year Review Report addresses remedial actions performed at the Former Waste Disposal Area (FWDA or OU-I), Former Manufacturing Facility (FMF or OU-II), and Lazy J Ranch (LJR or OU-III) at the American Standard Products site, located in Richmond and San Pablo, California (Figure 1) (the site). This report is being submitted in compliance with the Operations and Maintenance Agreement (OMA) between American Standard Inc. (ASI) and the California Department of Toxic Substances Control (DTSC) (DTSC 1997) for the three operating units. The 1997 OMA superseded the previous Consent Order HSA 89/90-001 dated 12 July 1989.

In accordance with the OMA, the intent of this report is to review the adequacy of the implemented remedy in protecting public health, safety and the environment. The OMA specifies that the results of environmental sampling and analysis, site inspections, and other site activities be reviewed and summarized. This report covers the period of July 2007 through June 2012. Separate Five-Year Reviews were previously conducted for the FWDA, FMF and LJR. The most recent Five-Year Reviews were conducted in 2007 for the FMF, in 2008 for the FWDA and in 2011 for the LJR. With the concurrence of DTSC, the Five-Year Review process for the three OUs has been consolidated into one Five-Year Review period and a single report.

The OMA requires the Five-Year Review to be consistent with the requirements of Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended.

1.1 Background

The site is composed of three operating units including the FMF and FWDA located southeast of the intersection of Palmer Avenue and Giant Road, and the LJR located on the west side of Giant Road across from the FMF and FWDA (Figure 2). Rheem Creek, an intermittent stream, separates the FMF and FWDA, and crosses the LJR. The 500-foot stretch of the channel for Rheem Creek separating the FMF and FWDA is considered part of the site. Land use in the vicinity of the site is mixed commercial, residential, and light industrial.

Between 1927 and 1976, ASI manufactured toilets and other ceramic plumbing fixtures at the FMF. Manufacturing wastes, such as "slip material" (fine-grained material present in wastewater) and waste glaze material, were disposed of in settling ponds within the FWDA (HLA 1991).

In the mid-1980s elevated concentrations of lead and zinc were detected in fill material at the FWDA and along the banks of the adjacent portions of Rheem Creek. Similar fill material with elevated concentrations of lead and zinc was also identified at the LJR (a former horse pasture), located to the west of the FWDA. Between 1983 and 1988, various engineering consultants conducted investigations and studies for the FWDA on behalf of ASI and government agencies. Between 1989 and 1993, various engineering consultants conducted investigations and studies for the LJR on behalf of ASI. During an investigation in 1990, contaminated soil and groundwater was discovered at the FMF. Petroleum hydrocarbons were detected in soil and groundwater near five underground storage tanks (USTs) that were discovered in a courtyard of

the manufacturing building. In addition, lead and zinc were detected in shallow soil at the northern portion of the FMF. During the 1990s remedial actions were selected and implemented separately for the three operating units.

ASI sold the FMF and FWDA to Orbit, Inc. in 1994. Orbit owned and operated the site until 2007 when Madison Financial acquired the property. Madison Financial currently owns the property. The FMF is currently operated as a light industrial warehouse facility with various tenants. The FWDA is currently used for storing pottery and automobiles.

In March 1995, the LJR was subdivided into three parcels. ASI purchased approximately 6.8 acres along the northern property boundary, extending over the northwest corner of the LJR site (Figure 2) for permanent containment of impacted soil, in accordance with the Final Remedial Action Plan (Kennedy/Jenks 1994). In 1999, Access Development acquired the rights to construct Budget Self-Storage on the containment cap of the LJR. The storage facility consists of shipping containers placed on concrete pads approximately four feet wide, eight feet long, and ranging in thickness from 2.5 inches to 8 inches. The purpose of the pads is to level the storage containers without the need to excavate into the cap.

After reorganization in 2007, ASI assumed the name Trane, Inc. (Trane). In 2008 Trane was purchased by Ingersoll Rand. Ingersoll Rand is responsible for compliance with the OMA.

Section 2: Summary of Remedial Actions

2.1 Remedial Objectives

In general, the remedial objective for the site is to protect human health and the environment by preventing exposure or migration of contaminants (HLA 1991, Levine Fricke 1995, Kennedy/Jenks 1994). An additional remedial objective for the FMF is to reduce chemical concentrations (Levine Fricke 1995).

2.2 Remedial Actions Selected

Containment capping was selected as the preferred remedial action for the FWDA and the LJR due to its efficacy in eliminating exposure to and reducing the mobility of the soil contaminants, and its relatively simple and cost-effective implementation (HLA 1991, Kennedy/Jenks 1994). The remedial action for the FWDA is described in Section 2.3.1. The remedial action for the LJR is described in Section 2.3.3.

For the FMF, removal of USTs and impacted soil followed by backfill with clean material and repaving, was selected as the preferred remedial alternative due to its efficacy in eliminating exposure to and reducing the mobility of the soil contaminants, cost-effective implementation, and compliance with ARARs (Levine Fricke 1995). Remediation of the lead and zinc-impacted soil north of the building consisted of utilizing the existing parking lot as a cap to prevent exposure to and mobilization of the lead and zinc. The remedial actions for the FMF are described in Section 2.3.2.

Deed restrictions were also implemented at all three OUs to further reduce the potential for human exposure to the chemically-impacted soils.

2.3 Remedial Actions Performed

2.3.1 Former Waste Disposal Area

Remedial actions of the FWDA consisted of interim and final remedial measures. Interim remedial actions included compliance with fence and post orders issued by the Department of Health Services (DHS, now known as the DTSC) on 3 January 1986 and 16 August 1989.

The RAP recommended containment capping with the following steps: regrading the site, redistributing (not offhauling) the soil; treating the top 6 inches of soil with a lime solution to harden the soil; application of a Claymax™ liner; topping the Claymax™ with sand and aggregate base, and paving the site with asphaltic concrete. Designated portions of Rheem Creek would be lined with concrete or shotcrete over Claymax™. The Claymax™ liner is a ¼-inch thick liner composed of dry bentonite applied to geotextile fabrics. It is flexible and has a permeability of 2×10^{-10} centimeters/second (HLA 1991). This program would provide two barrier layers, and was considered protective of human health by elimination of human contact with the soil and prevention of dust generation.

The cap construction was completed between July 1992 and July 1993 as reported in the Post-Construction Report (Harding Construction Services 1993). Rheem Creek was cleared and lined with concrete and rip rap on the upstream portion in October 1992. The grading and lime treatment was completed by January 1993, after which the contractor demobilized pending the onset of drier weather. In May 1993 work resumed, and the ClaymaxTM liner was installed, followed by application of the sand and aggregate base. The asphaltic concrete was put in place by July 1993 and construction was officially completed. Retaining walls, curb and gutters, lighting, and fencing were also installed.

2.3.2 Former Manufacturing Facility

The remediation of the FMF was completed in 1996. Activities associated with removal of the USTs and impacted soil are outlined below. Levine Fricke provided construction management services, including field observation, confirmation sampling and air monitoring (Levine Fricke 1997b). Figure 2 outlines the former locations of three 19,000-gallon steel USTs, one 16,000-gallon concrete UST and one 13,000-gallon steel UST.

- A diesel generator building was demolished on 25 July 1996. The building was located in the building courtyard near a 16,000-gallon concrete UST and one of the 19,000-gallon steel USTs. Reinforced masonry block and concrete debris from the building was disposed of at the West Contra Costa Landfill (WCCL) in Richmond, California.
- Removal of four steel USTs occurred between 7 August 1996 and 4 September 1996. Each UST contained a water and residual hydrocarbon liquid that was pumped from the tank using a vacuum truck. Liquids were transported to Evergreen Oil, Inc. in Newark, California for recycling. The tanks were then cut open to allow excavation of a clayey material referred to as slip within the porcelain industry. The slip material was accepted for disposal at the Forward Landfill after a sample analyzed for total petroleum hydrocarbons as diesel (TPHd), TPH as motor oil (TPHmo), polynuclear aromatic hydrocarbons (PNAs), semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs) and metals only showed concentrations of TPHd and TPHmo at 670 milligrams per liter (mg/l) and 410 mg/l TPHmo, respectively. The USTs were removed from the ground, cleaned, and transported to a metal recycling facility in Richmond, California. Piping connected to the USTs was removed to the limits of the excavation. Under approval from DTSC and the Contra Costa County Health Services Department (CCCHSD), the remaining 72 feet of pipe was abandoned in place by sealing both ends with concrete.
- Demolition of a concrete UST occurred on 19 August 1996. The concrete UST contained dry slip that was removed and mixed with the slip removed from the steel USTs. The inside of the concrete UST was subsequently pressure washed, the upper three to five feet of the UST walls were removed and holes were punched into the bottom of the UST. The UST was then backfilled with soil. Concrete and steel debris from the UST was transported to the WCCL for disposal.
- To the extent feasible, soil impacted by petroleum hydrocarbons was removed from the vicinity of the USTs. Approximately 1,500 cubic yards of soil was excavated and stockpiled at the site. The stockpiled soil was transported to the Altamont Landfill

between 14 August 1996 and 19 September 1996. Groundwater that entered the excavation area during UST removal was sampled and analyzed for TPH as gasoline (TPHg), TPHd, TPHmo, benzene, toluene, ethylbenzene, and total xylenes (BTEX), and PNAs. Approximately 33,000 gallons of liquid from the USTs and the excavation area were transported to Evergreen Oil in Newark, California.

Drain rock gravel was placed in the bottom of the excavation because the bottoms of the USTs were below the groundwater level. A filter fabric was placed over the drain rock to segregate the sand (placed on top of the gravel) and the gravel. Sand was placed to six inches below the ground surface. The remaining six inches consisted of aggregate base. Finally, the entire courtyard was repaved with three inches of asphaltic concrete. The paving was completed on 11 and 12 November 1996.

- The paved area north of the building was utilized as a barrier to prevent exposure to the underlying lead- and zinc-impacted soil. In addition to identifying the existing pavement as a remedial action, a deed restriction was implemented for the area north of the FMF to further protect against exposure to the impacted soil.

2.3.3 Lazy J Ranch

The remediation of the LJR was completed in three phases, including interim excavation, final remediation, and supplemental remediation. Kennedy/Jenks provided construction management services, including confirmation sampling and air monitoring, during all three phases. Each remediation phase is described below.

The interim excavation was completed during February through April 1995 (Kennedy/Jenks 1996b). Approximately 8,500 cubic yards of impacted material within the Richmond Parkway easement were excavated and stockpiled to enable both the LJR remediation and the Parkway construction projects to proceed on their respective schedules. Richmond Parkway was constructed in the late 1990s and was built as an elevated structure over the LJR. The interim excavation helped minimize potential conflicts between ASI's remediation contractor and the City of Richmond's Parkway construction contractor.

The final remediation was completed during July through November 1995 (Kennedy/Jenks 1996b). Activities associated with the final remediation included excavation of approximately 25,900 cubic yards of impacted material from areas throughout the LJR, consolidation within the northwest corner of the LJR, and placement of a containment cover over the impacted material.

The RAP for the LJR recommended containment capping with the following steps: excavating contaminated soil, placement of contaminated soil in containment area, treating the top 6 inches of soil with a lime solution to harden the soil; application of a ClaymaxTM liner; topping the ClaymaxTM with sand and aggregate base, and paving the site with asphalt concrete.

The cap construction was completed between September and November of 1995 as follows:

- 25 September 1995 – Grading of the site was completed.

- 18 October 1995 – Placement of the Claymax™ liner and sand were completed.
- 27 October 1995 – The aggregate base was placed.
- 13 November 1995 – Placement of the asphalt concrete was completed.

Curb, gutters and fencing were also installed following completion of the cap paving.

The supplemental remediation was completed in July and August 1996 (Kennedy/Jenks 1996b). Excavation of approximately 360 cubic yards of impacted material within the Richmond Parkway easement, that was not removed by the City's contractor during the interim excavation and was inaccessible during the final remediation due to the construction of the Parkway, took place. The excavated soil was placed under the Richmond Parkway and capped to act as an access road to the final remediation capped area.

Section 3: Evaluation of Remedial Actions

3.1 Document Review

The following documents established requirements to be followed during planning and execution of the remediation and post-remediation monitoring phases for the site.

3.1.1 Consent Order

Consent Order HSA 89/90-001, dated 12 July 1989, provided a chronology of the FWDA and FMF (OU-I and OU-II) (DTSC 1989). The Order describes requirements for a Remedial Investigation/Feasibility Study, RAP, and implementation of the RAP to remedy environmental impact at OU-I and OU-II. The Consent Order HSA 89/90-001 was superseded by the OMA HSA 96/97-062.

3.1.2 Covenants of Deed Restriction

Covenants of Deed Restriction were entered into by ASI and by DTSC and recorded on 4 May 1992 for the FWDA (ASI 1992), on 31 May 1996 for the northwest portion of the LJR covered by the cap (ASI 1996), and on 23 May 1997 for a portion of the FMF (see Figure 2; Robie, L.P. 1997). The deed restrictions place restrictions on development and use of the site, and include provisions for conveyance of the property and termination or modification of the deed restrictions. Restrictions include:

- The property will be used only for commercial or industrial purposes.
- No farming or grazing will be allowed on the property.
- Construction of hospitals, day-care centers, schools, senior citizen centers, or other non-industrial human habitation will be disallowed on the property.
- The property shall be covered with asphalt or concrete or remain beneath paved areas and building foundations.
- The property will not be subdivided.
- Disturbance of the soils will be disallowed without written permission from DTSC.
- Groundwater monitoring and cap maintenance will be conducted in accordance with the Operations and Maintenance Plan (OMP).
- The integrity of the cap will be preserved and any damage to the cap will be reported to DTSC.
- The owner will inform DTSC within 30 days of any conveyance of the property to another party.
- DTSC will have the authority to take enforcement action against the owner if any requirements in the deed restriction are violated.
- A statement addressing the hazardous wastes present on the site will accompany any conveyance documents.

Unless modified, the Covenants of Deed Restriction will continue in effect in perpetuity.

3.1.3 Operation and Maintenance Plans

The OMP for the FWDA was prepared by HLA and includes an OMP submitted on 11 December 1992 (HLA 1992) and Response to Comments dated 5 March 1993. The OMP for the LJR was prepared by Kennedy/Jenks and is dated 30 August 1996 (Kennedy/Jenks 1996a). The OMP for the FMF was prepared by Levine Fricke and is dated 5 March 1997 (Levine Fricke 1997a).

The OMPs identify inspection and repair procedures to maintain containment of capped soil at the FWDA, north of the FMF, and at the LJR, as well as procedures for sampling the groundwater monitoring wells. Provisions of the OMPs include routine pavement inspections, routine groundwater and surface water sampling, submittal of groundwater monitoring reports and paved area inspection reports to DTSC, reevaluation of site inspection and groundwater sampling frequency and reevaluation of remedial action after five years.

3.1.4 Operation and Maintenance Agreement

OMA 96/97-062, dated 13 May 1997 (DTSC 1997), directs ASI to implement the OMPs for OU-I, OU-II, and OU-III and any approved modifications to the OMPs. The OMP for each OU is included as part of the OMA. In addition, the OMA specifies requirements for, among other things, environmental monitoring and reporting, Five-Year Reviews, emergency response actions, records retention, and financial assurance.

3.1.5 FWDA Remedial Action Documents

3.1.5.1 FWDA Remedial Action Plan

The RAP (HLA 1991) was prepared by HLA to fulfill requirement 3.4.1 of the Consent Order between the DHS (now the DTSC) and ASI. The RAP reviewed the findings of the Remedial Investigation (*Site Investigation, Former American Standard Property, San Pablo, California*, prepared by Woodward-Clyde Consultants 1987), the Exposure Assessment (*Exposure Assessment for the Former American Standard Products Site in Contra Costa County*, prepared by Karch and Associates, Inc., 13 July 1989), and the Feasibility Study (*Screening of Remedial Alternatives, Former American Standard Property, San Pablo, California*, prepared by HLA, 30 August 1989, and *Feasibility Study Addendum, Evaluation of In Situ Immobilization, Former American Standard Property, San Pablo, California*, prepared by HLA, 7 May 1990).

The RAP discusses the site background and history, the extent of contamination, the findings of previous investigations, and it presents a synopsis of treatment alternatives presented in the Exposure Assessment and the Feasibility Study. The RAP reviews state and federal regulations and potentially applicable project requirements. It also discusses reasons for the recommendation of containment capping as the preferred remedial alternative. The RAP provides an outline for operation and maintenance requirements for the site after containment capping is completed.

3.1.5.2 FWDA Post-Construction Report

The Post Construction Report (Harding Construction Services 1993) documents the construction activities implementing the remedial design for the FWDA and Rheem Creek. It includes photographs of the construction, as-built drawings, and the engineers' certification of completion.

3.1.6 FMF Remedial Action Documents

3.1.6.1 FMF Final Removal Action Work Plan

The Final RAW (Levine Fricke 1995) was prepared to fulfill the Consent Order between the Department of Health Services (now DTSC) and ASI. The RAW discusses the site background and history, the findings of previous investigations, the soil cleanup goal set by DTSC, and it presents a synopsis of removal alternatives as well as a comparative analysis of the alternatives with a recommendation for the preferred removal alternative. ARARs, objectives and scope of work were reviewed for the tank removal. The RAW recommended monitoring groundwater at the FMF for TPHd, TPHmo, TPHg, and BTEX quarterly for two years.

It was noted during the review of the RAW that monitoring wells MW-1LF, MW-2LF, and MW-3LF were formerly referred to as monitoring wells ASI-MW1, ASI-MW2, and ASI-MW3, respectively by Levine Fricke.

3.1.6.2 FMF Tank Closure Report

The Tank Closure Report (Levine Fricke 1997b) documents the UST removal. It includes field observations, confirmation sample data, manifests for tank and material removal and photographs of the field activities.

3.1.6.3 FMF Cap Paving Completion Report

In a letter dated 21 November 2002, Ms. Barbara Cook of DTSC (DTSC 2002) requested ASI to "...repair or replace areas of the pavement where repair or replacement is necessary..." at the FMF. A Cap Paving Completion Report (Kennedy/Jenks 2003a) was completed and submitted to DTSC on 14 November 2003. The Cap Paving Completion Report documents the repair of the pavement that was conducted at the FMF in October 2003 in response to DTSC's request to repair damaged pavement areas.

Kennedy/Jenks arranged for Dalzell Corporation (Dalzell) to complete the paving of the cap. The paving extended to the lateral ends of the cap on the north side and the east side of the building and consisted of applying a tack coat and an approximate two-inch overlay of asphalt. Paving activities were observed by Mr. Ed Childers, P.E. of Kennedy/Jenks and Mr. LeRoy Fister, the foreman of Dalzell.

3.1.7 LJR Remedial Action Documents

3.1.7.1 LJR Remedial Action Plan

The RAP (Kennedy/Jenks 1994) reviewed the findings of the Site Investigation (Woodward-Clyde Consultants 1987), the human health and environmental risk assessment (HLA 1992), and the Feasibility Study (HLA 1993). The RAP discussed the site background and history, the extent of contamination, the findings of previous investigations, and it presented a synopsis of treatment alternatives discussed in the human health and environmental risk assessment and the Feasibility Study. The RAP reviewed state and federal regulations and potentially applicable project requirements. It also discussed reasons for the recommendation of containment capping as the preferred remediation alternative. The RAP provided an outline for operation and maintenance requirements for the site after containment capping is completed.

3.1.7.2 LJR Post Construction Report

The Post Construction Report (Kennedy/Jenks 1996b) documents the progress of the cap construction at the LJR. It includes as-built drawings, grading plans, and photographs of the construction.

3.1.8 Semi-Annual and Annual Inspection Reports

Inspections of the cap at the FWDA began in 1995 and were conducted by Orbit, Inc. (the former property owner). The cap inspection frequency was reduced to semi-annual after the first Five-Year Review was completed in September 1998. Kennedy/Jenks has conducted the site inspections since 1999 on behalf of ASI (now Ingersoll Rand).

Inspections of the cap at the LJR on a quarterly basis began in the first quarter 1996. DTSC approved a reduction of the inspection frequency to semiannual in a letter dated 20 October 2003 (DTSC 2003). Kennedy/Jenks has conducted the cap inspections and submitted the report on behalf of ASI (now Ingersoll Rand) since 1996.

Semi-annual inspections of the paved area of the FMF began in the first quarter of 1998. Kennedy/Jenks has conducted the cap inspections and submitted the report on behalf of ASI (now Ingersoll Rand) since 1998.

DTSC approved a reduction in the inspections for all three OUs from semiannual to annual in a letter to ASI dated 17 October 2006 (DTSC 2006).

3.1.9 Groundwater and Surface Water Monitoring Reports

Results from semi-annual and annual groundwater monitoring events for the FMF, FWDA, and LJR were reported in the groundwater monitoring reports starting in 1991, 1986, and 1990, respectively. These reports were prepared by Kennedy/Jenks starting in 1993 through 2006, and were submitted to DTSC.

Historically, there were a total of 5 monitoring wells at the FWDA, 6 monitoring wells at the FMF, and 10 monitoring wells at the LJR. At the FWDA, monitoring wells W-1 and W-2 were installed

in 1986, monitoring wells W-3 and W-4 were installed in 1987, and monitoring well W-5 was installed in 1990. All five monitoring wells were destroyed in 2007. At the FMF, monitoring wells HW-1 through HW-3 and MW-1LF through MW-3LF (formerly ASI-MW1 through ASI-MW3) were installed in 1991 through 1993. Monitoring wells HW-2 and HW-3 were replaced by monitoring wells HW-2R and HW-3R, respectively, in 1994. Monitoring wells HW-1 and HW-2R were destroyed in 2007. Monitoring well MW-3LF was destroyed in 1996 during tank removal operations, and monitoring well MW-1LF was destroyed in late 1996 or early 1997. At the LJR, monitoring wells MW-1 through MW-7 were installed in 1990 and monitoring wells MW-8 through MW-10 were installed in 1996. Monitoring wells MW-1 through MW-3, MW-5, and MW-7 were destroyed in 1994; monitoring well MW-4 was accidentally destroyed in 1999 and DTSC did not require replacement of the well; and the remaining wells were destroyed in 2007.

Surface water samples were also collected at two locations on Rheem Creek annually starting in 1999 (Figure 2) and the results were reported in the surface water monitoring reports.

In October 2006, DTSC approved destruction of all of the monitoring wells located at the FWDA and LJR, and the destruction of monitoring wells HW-1 and HW-2R at the FMF (DTSC 2006). DTSC also approved elimination of the surface water monitoring requirements. Monitoring wells MW-2L and HW-3R at the FMF were left in place and will be monitored and sampled for TPH every five years as part of the FMF five-year review. Monitoring wells MW-2L and HW-3R were sampled in May 2012 as part of the current five-year review.

3.1.10 Previous Five-Year Reviews

Previous five-year reviews have been conducted for the FWDA, FMF, and LJR and included discussions of the site background and chronology, summary of the remedial actions, summary of relevant documentation, discussion of the results of five years of inspections and monitoring, and recommendations.

3.1.10.1 Former Waste Disposal Area

The first Five-Year Review was submitted to DTSC by Kennedy/Jenks on behalf of ASI on 28 September 1998 (Kennedy/Jenks 1998). Recommendations from the first Five-Year Review included reduction of cap inspection frequency from quarterly to semiannual, replacement of dead trees along Palmer Avenue, collection of two surface water samples during the first quarter 1999, and decrease of the financial assurance requirements.

The second Five-Year Review was submitted to DTSC by Kennedy/Jenks on behalf of ASI on 29 September 2003 (Kennedy/Jenks 2003b). Recommendations from the second Five-Year Review included continuation of semiannual site inspections and annual groundwater and surface water sampling, addition of TPH to the analytical suite for one sampling event, assessment of the re-establishment of vegetation along Palmer Avenue, and decrease of the financial assurance requirements.

The Third Five-Year Review Report was submitted to DTSC by Kennedy/Jenks on behalf of Trane on 28 October 2008 (Kennedy/Jenks 2008). The recommendations included continuation of annual cap inspections, weed removal and crack sealing on the east side of the cap,

decrease of the financial assurance requirements, and submittal of the next five-year review in July 2013.

3.1.10.2 Former Manufacturing Facility

The first Five-Year Review was submitted to DTSC by Kennedy/Jenks on behalf of ASI on 6 June 2002 (Kennedy/Jenks 2002). Recommendations from the first Five-Year Review included continuation of semiannual depth-to-groundwater measurements, repair and replacement of the cap at various locations, incorporation of a silica gel cleanup on the samples analyzed for TPH, increase of the financial assurance requirements, and submittal of the next five-year review in June 2007.

The second Five-Year Review was submitted to DTSC by Kennedy/Jenks on behalf of ASI on 3 August 2007 (Kennedy/Jenks 2007). Recommendations from the second Five-Year Review included continuation of annual site inspections, application of herbicide to the perimeter of the paved area, collection of samples and depth-to-groundwater measurements in monitoring wells MW-2LF and HW-3R in June 2012, decrease of the financial assurance requirements, and submittal of the next five-year review in June 2012.

3.1.10.3 Lazy J Ranch

The First Five-Year Review Report was submitted to DTSC by Kennedy/Jenks on behalf of ASI on 30 July 2001 (Kennedy/Jenks 2001). The recommendations included reduction of cap inspection frequency from quarterly to semiannual, continuation of semiannual depth-to-groundwater measurements, decrease of the financial assurance requirements, and submittal of the next five-year review in August 2006.

The Second Five-Year Review Report was submitted to DTSC by Kennedy/Jenks on behalf of ASI on 5 July 2006 (Kennedy/Jenks 2006). The recommendations included continuation of semiannual cap inspections and semiannual depth-to-groundwater measurements, increase of the financial assurance requirements, and submittal of the next five-year review in July 2011.

The Third Five-Year Review Report was submitted to DTSC by Kennedy/Jenks on behalf of Ingersoll Rand on 30 June 2011 (Kennedy/Jenks 2011). The recommendations included continuation of annual cap inspections, increase of the financial assurance requirements, and submittal of the next five-year review in July 2016.

3.2 Results of Monitoring Activities

3.2.1 Cap Inspections

Cap inspections were conducted annually for all three OUs from 2007 through 2012 and indicate that the constructed remedial facilities appear to be in generally acceptable condition. Observations at the three OUs included minor cracks and weed growth in the cracks and around the perimeters of the caps. The drainage systems were generally observed to be clean and clear with the exception of sand and weed growth along the valley gutter for the LJR. Fencing and security systems were generally observed to be functioning and intact, with the exception of a cut section at the FWDA in 2007, frayed or missing barbed wire at the FMF and

LJR, and unlocked gates at the FWDA in 2012. Recommendations included continued monitoring for cap degradation, weed removal, crack sealing, and general debris removal.

3.2.2 Maintenance

In addition to routine weed removal, repairs to the asphalt cap were performed twice during the five-year period. Crack sealing at the FMF and FWDA and repair of holes observed in the side slopes at the LJR was conducted in 2008. Crack sealing was conducted at the FWDA and LJR again in 2010.

3.2.3 Groundwater Monitoring

Groundwater monitoring during this five-year period consisted of collection of samples from wells MW-2LF and HR-3R at the FMF in May 2012. A summary of TPHg, TPHd, TPHmo, and BTEX monitoring data for May 2012 is presented in Table 1. Historical groundwater monitoring data are included in Appendix A and historical groundwater elevation data are included in Appendix B. Monitoring wells MW-2LF and HW-3R are both downgradient of the former location of the USTs. Monitoring well MW-2LF is closest to the former USTs in the downgradient direction followed by monitoring well HW-3R.

The May 2012 monitoring event involved the measurement of the depth to water from the tops of casing of the two monitoring wells; collection of groundwater samples from the two monitoring wells; observation of groundwater for the presence of floating/immiscible product, discoloration, and odor; and laboratory analysis of the groundwater samples for TPHd and TPHmo with silica gel cleanup, and TPHg and BTEX. Copies of the field forms are provided in Appendix C and the laboratory analytical report is provided in Appendix D.

3.2.3.1 Results

TPHg and BTEX were not detected at concentrations exceeding analytical reporting limits in samples collected in 2012. TPHd and TPHmo were not detected at concentrations exceeding analytical reporting limits in the sample collected from monitoring well HW-3R. TPHd was detected in the sample collected from monitoring well MW-2LF at 0.32 mg/l and TPHmo was detected at 0.14 mg/l. The detected concentrations in monitoring well MW-2LF are consistent with historical results. Monitoring wells HW-3R and MW-2LF are in good condition and will continue to be monitored every five years for TPHg, TPHd, and TPHmo as part of the Five-Year Review for the FMF.

3.2.4 5-Year Review Site Inspection

A site inspection was conducted on 23 May 2012 by Maya Key, P.E. and Alicia Stamps, P.E. of Kennedy/Jenks. The inspection included an assessment of the asphalt covers, perimeter fencing, gates and locks, and drainage systems for the three OUs. The inspection was conducted by walking around the capped areas. Photographs were taken during the site inspection and are included in Appendix E. Summaries of the results of the site inspections are included as Tables 2 through 4.

The caps at the three OUs generally appeared to be in good condition. Cracks had been sealed in 2008 and 2010. Some sealed cracks had reopened and some new or lengthened cracks were visible. Generally cracks are hairline fatigue cracks and many are linear, possibly along seams. Minor raveling or gouging was observed in some areas. Evidence of deterioration appears to correlate to age and level of activity. The paving of the FWDA was completed in 1993, the paving of the LJR was completed in 1996, and the FMF parking lot was repaved in 2003. At the FWDA more deterioration is observed in the east side, which has been used for storage of automobiles and parts, than the west side, which is currently used for storage of pottery. At the FMF more deterioration is observed at the north entrance to the auto body shop and the loading ramp than the parking or entrance/egress areas. At the LJR more deterioration is generally observed in the perimeter road, although activities and events such as fires at the storage units have caused deterioration in some internal areas. Perimeter fencing at the three OUs appears to be maintained in good condition. Drainage systems including catch basins and gutters generally appeared to be in good condition with minor weed growth and debris. Evidence of ponding was observed at one internal catch basin at the LJR. The concrete lining of Rheem Creek appears to be in good condition with minor hairline cracks.

3.3 ARAR Review

Although the site is not on the EPA's National Priorities List, the OMA does require the site to be consistent with CERCLA requirements. Under Section 121 of the Superfund Amendments and Reauthorization Act of 1986 (SARA), remedial actions must be protective of human health and the environment, which implies complying with applicable, relevant, and appropriate requirements (ARARs). The EPA defines ARARs as the following (40 CFR 300.5):

- Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site.
- Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not 'applicable' to a hazardous substance, pollutant, containment, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

The caps continue to prevent exposure through direct contact or inhalation of dust and reduce the potential for migration of contaminants of concern to groundwater, and therefore they continue to comply with ARARs for groundwater, soil, and air. The ARARs identified in the RAW for the FMF focused on UST removal and are no longer applicable to the site.

The previous five-year reviews for the OUs discussed the applicability of the groundwater ARAR. The current state drinking water standard for zinc of 5.0 milligrams per liter (mg/l) is a secondary maximum contaminant level (MCL). Secondary MCLs are established based on acceptable levels related to the taste, odor, or appearance of drinking water, and are not

health-based. The current California primary MCL for lead is 0.015 mg/l, for benzene is 0.001 mg/l, for ethylbenzene is 0.3 mg/l, for toluene is 0.15 mg/l, and for total xylenes in 1.75 mg/l. There are no current federal or state standards for TPHg, TPHd, or TPHmo. The applicability of these MCLs as ARARs is questionable because the groundwater being sampled at the site is in an aquifer that is not likely to ever be used as a drinking water source, and the action level for lead applies to the 90th percentile of sample results measured at the consumer's drinking water tap. Additionally, historical groundwater sample results indicate that the standards have not been exceeded.

3.4 Statement of Protectiveness

The remedial actions continue to function as intended. The asphalt caps prevent exposure of the underlying soil. Maintenance of the caps is sufficient to maintain their integrity throughout the lifespan of the caps.

Therefore, it is our opinion that the remedial actions at the three OUs are expected to be protective of human health and the environment, and exposure pathways that could result in unacceptable risks are being controlled.

Section 4: Evaluation of Financial Assurance Requirements

Financial assurance requirements were originally established as part of the OMPs (Levine Fricke 1997a, HLA 1992, Kennedy/Jenks 1996a). These financial requirements were based on a project life of 30 years and were based on 1996 DTSC labor rates that are no longer in effect. The project financial assurance requirements have been updated for each OU as part of the previous Five-Year Reviews and have been revised again to reflect modified operation and maintenance costs and estimated construction costs for providing an asphalt overlay to the caps in 15 years. The new proposed financial assurance requirements are presented in Table 5.

The new financial assurance requirements reflect the present worth of annual operation and maintenance (O&M), including five-year reviews, until 2042 using a prime interest rate of 5.00 percent and a regional inflation rate of 3.00 percent. The estimated present value capital cost to repair and seal the asphalt caps in 15 years was added to the present worth of the annual O&M cost.

Section 5: Conclusions and Recommendations

Results of the Five-Year Review indicate the following:

- The implemented remedial actions are functioning as designed and are adequate for protection of human health and the environment.
- The cap inspections indicate that maintenance activities have been adequate to maintain the integrity of the remedial facilities.
- Groundwater elevations are within historical groundwater elevations at the FMF and concentrations of TPHg, TPHd, and TPHmo in groundwater samples at the FMF are consistent with historical results.
- The current site inspection frequency is adequate to evaluate the condition of the remedial facilities and identify necessary maintenance activities.

On the basis of this Five-Year Review, we recommend the following:

- Continue the annual site cap inspections and response to identified maintenance items.
- Update the site financial assurance requirement to a total of \$859,700 for the three OUs.
- Collect samples and depth-to-groundwater measurements of monitoring wells MW-2LF and HW-3R in June of 2017. Samples are to be analyzed for TPH with silica gel cleanup.
- Submit the next Five-Year Review Report in June of 2017.

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