ADDITIONAL INVESTIGATION REPORT

CLOSED CITY OF YAKIMA LANDFILL SITE

YAKIMA, WASHINGTON

Prepared for

City of Yakima

March 17, 2010

Prepared by

SLR International Corp
22122 20th Avenue SE, Building H, Suite 150
Bothell, Washington 98021

Project 001.0221.00006

Additional Investigation Report
Closed City of Yakima Landfill Site
Yakima, Washington

The material and data in this report were prepared under the supervision and direction of the undersigned.

MICHAEL D. STATON

Michael D. Staton, L.G.
Principal Geologist

3/17/10
Date

3.17.10

ANNE GREENOUGH UDALOY

Anne Udaloy, L.H.G.
Principal Hydrogeologist

3/17/10
Date

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EXECUTIVE SUMMARY

From November 2009 through February 2010, SLR International Corp (SLR) completed an additional subsurface investigation of the closed City of Yakima Landfill (Yakima Landfill) site. The objective of the additional investigation activities was to obtain the data necessary to resolve the following investigation data gaps.

- The elemental and isotopic compositions of soil vapors generated by municipal solid waste (MSW) and wood waste had not been analyzed; therefore, the areas where wood waste is the primary source of methane gas could not be differentiated from the areas where MSW is the primary methane source.

- Seasonal changes in methane concentrations had not been adequately assessed; therefore, the potential for seasonal variations in methane gas migration (and the associated risk) had not been defined.

- The sources of the preliminary groundwater indicator hazardous substances (IHSs; arsenic, sodium, iron, manganese, pH, nitrate, and vinyl chloride) had not been adequately identified.

- The downgradient (south-southeast) extent of the impacted groundwater had not been delineated.

- Seasonal variations in groundwater flow directions and groundwater quality at locations upgradient, beneath, and downgradient of the landfill had not been characterized.

- The hydraulic and geochemical interactions between site groundwater and the Yakima River had not been fully defined, including potential seasonal variations in groundwater flow paths between the landfill and the river, the location of the groundwater discharge area, and the water quality at the discharge area.

Sources and Migration of Methane Gas

To collect the data necessary to try to differentiate the areas where wood waste is the primary source of methane gas from the areas where MSW is the primary source of methane gas, four soil vapor probes (designated GP-19 through GP-22) were installed

within the landfill and to the north of the landfill (within wood waste), and soil vapor samples were collected from the new probes and existing probes GP-3, GP-11, and GP-13 for laboratory analysis. The soil vapor sample analytical results showed that specific compositional data, such as the relative amounts of CO_2 and nitrogen, could be used to identify the methane gas generated by MSW and the methane gas generated by wood waste. Based on the sample analytical results, it appears that the gas at probes located within the landfill footprint (GP-19, GP-20, and GP-21) was generated by decomposition of MSW, and the gas at two probes located to the north of the landfill (within wood waste; GP-13 and GP-22) was generated by the decomposition of wood waste. However, the gas at probe GP-11 appears to be generated by the decomposition of MSW even though it is located approximately 60 feet to the north of the landfill and is screened within wood waste. Due to anomalously high nitrogen concentrations in the soil vapor samples from probe GP-3, the source of the methane concentrations near the east side of the former plywood plant building could not be identified.

To evaluate the seasonal variations in methane concentrations, soil vapors were extracted and analyzed in November 2009 and February 2010, from the new probes and from existing probes GP-3 through GP-18, by using a CES/Landtec GEM-2000 multi-gas meter. The methane concentrations measured in the soil vapor probes ranged from 0 to 77.7 percent. The greatest methane concentrations (61.3 to 77.7 percent) were detected at the probes located within the footprint of the landfill (screened within MSW). Elevated methane concentrations (41.9 to 62.4 percent) were also detected at the probes located to the north of the landfill that are screened within wood waste. Near the northwest, west, and southwest edges of the landfill, the methane concentrations (19.9 to 50.0 percent) exceeded the upper explosive limit (15 percent by volume). Further to the west and southwest, along the property line, methane was not detected. To the south and northeast of the landfill area, near the property line, methane was also not detected. The soil vapor sampling results from this investigation and the previous SLR investigation indicate that the methane gas concentrations have been fairly consistent and that seasonal variations in methane gas migration beneath the southern part of the sawmill property are minimal.

Combustible gas measurements were not collected within the former plywood plant building; however, based on the soil vapor sampling results from this investigation and the previous SLR investigation, elevated methane concentrations (22.6 to 50 percent) were measured in a soil vapor probe (GP-10) located less than 20 feet from the southeast corner of the building. Therefore, it is likely that methane concentrations exceed the

lower explosive limit (LEL; 5 percent by volume) in soils beneath the southern part of the building. Methane concentrations (13.2 to 19.5 percent) above the LEL were measured in a soil vapor probe (GP-3) located less than 30 feet from the east side of the building. Therefore, methane concentrations may exceed the LEL in soils beneath the eastern part of the building. It is also possible that methane concentrations exceed 25 percent of the LEL within portions of the building. Based on limited wood waste near the southern end of the building, the methane at GP-10 is likely due to decomposition of MSW. The source of the methane at GP-3 could not be determined.

Sources and Downgradient Extents of Groundwater IHSs

To assess the sources of the preliminary groundwater IHSs (arsenic, iron, vinyl chloride, manganese, sodium, nitrate, and pH), one groundwater monitoring well (designated MW-18) was installed at a location to the north (hydraulically upgradient) of the landfill area. To delineate the downgradient (south-southeast) extent of the impacted groundwater and to characterize the hydraulic and geochemical interactions between the site groundwater and the Yakima River, four groundwater monitoring wells (designated MW-14 throught MW-17) were installed at locations to the east, south, and southeast of the sawmill property. In November 2009 and February 2010, groundwater samples were collected from the new wells and from existing wells MW-7, MW-8, MW-9A, MW-11, MW-12, and MW-13 for laboratory analysis. The groundwater sample analytical results showed that the samples from the wells located hydraulically upgradient of the landfill (MW-11 and MW-18) contained the greatest dissolved arsenic and dissolved iron concentrations, and the concentrations steadily decreased with distance towards the Yakima River. This indicates that the sources of the arsenic- and iron-impacted groundwater are located upgradient of the landfill (likely associated with the former Boise Cascade mill operations). Since the MSW does not appear to be a source of the arsenic- and iron-impacted groundwater, arsenic and iron were eliminated as groundwater IHSs for the Yakima Landfill site.

None of the groundwater samples contained detectable vinyl chloride concentrations. Since vinyl chloride was not detected in any of the samples collected during this investigation or the previous SLR investigation, vinyl chloride was eliminated as groundwater IHS for the Yakima Landfill site.

The groundwater sample analytical results showed that samples from upgradient well MW-18 contained dissolved manganese and dissolved sodium concentrations that exceeded the groundwater screening levels; however, one or both of the samples from a well located near the southern (downgradient) end of the landfill (MW-8) contained manganese and sodium concentrations that exceeded the concentrations at MW-18. This indicates that a significant source of the manganese- and sodium-impacted groundwater is located upgradient of the landfill, but MSW also appears to be contributing to the concentrations. The manganese and sodium appear to extend to the Yakima River; however, there are no surface water cleanup levels for manganese or sodium.

The groundwater samples from wells located near the southern (downgradient) end of the landfill contained nitrate concentrations that exceeded the groundwater screening level. The nitrate concentrations above the screening level likely extend beyond the southern end of the sawmill property; however, the elevated concentrations do not appear to extend beyond the neighboring JELD-WEN property. Based on the groundwater sampling results, the source of the elevated nitrate concentrations is likely MSW.

The groundwater samples from wells located upgradient of the landfill and near the downgradient end of the landfill contained pH values that were more acidic than the screening level range. The groundwater sampling results indicate that the primary source of the acidic groundwater conditions is located hydraulically upgradient of the MSW; however, the MSW is contributing slightly to the acidic conditions. Since the MSW is not the primary source of the acidic groundwater conditions, pH was eliminated as a groundwater IHS for the Yakima Landfill site.

Groundwater Flow Directions and Discharge Locations

In November 2009 and February 2010, the groundwater flow directions were fairly consistent with previous interpretations. Beneath the landfill, the groundwater generally flows from the northwest to the southeast; however, the flows beneath the western portion of the landfill are strongly influenced by an apparent recharge area located near well MW-13. The groundwater beneath the landfill eventually discharges to the Yakima River at locations east-southeast of the landfill area. Based on the distribution of several groundwater analytes (iron, arsenic, manganese, and sodium), it appears that the groundwater beneath the landfill area has historically flowed to the south-southeast.

1 INTRODUCTION

From November 2009 through February 2010, SLR International Corp (SLR) completed an additional subsurface investigation of the closed City of Yakima Landfill (Yakima Landfill) site. The Yakima Landfill is located at the south end of the former Boise Cascade Sawmill and Plywood Facility (sawmill). The sawmill property is located at 805 North 7th Street, in the northeastern part of Yakima, Washington (see Figure 1).

SLR recently completed a remedial investigation at the landfill area. Based on the results of the investigation activities, the following investigation data gaps were identified:

- The elemental and isotopic compositions of soil vapors generated by municipal solid waste (MSW) and wood waste had not been analyzed; therefore, the areas where wood waste is the primary source of methane gas could not be differentiated from the areas where MSW is the primary methane source.

- Seasonal changes in methane concentrations had not been adequately assessed; therefore, the potential for seasonal variations in methane gas migration (and the associated risk) had not been defined.

- The sources of the preliminary groundwater indicator hazardous substances (IHSs; arsenic, sodium, iron, manganese, pH, nitrate, and vinyl chloride) had not been adequately identified.

- The downgradient (south-southeast) extent of the impacted groundwater had not been delineated.

- Seasonal variations in groundwater flow directions and groundwater quality at locations upgradient, beneath, and downgradient of the landfill had not been characterized.

- The hydraulic and geochemical interactions between site groundwater and the Yakima River had not been fully defined, including potential seasonal variations in groundwater flow paths between the landfill and the river, the location of the groundwater discharge area, and the water quality at the discharge area.

The objective of the additional investigation activities was to obtain the data necessary to resolve these data gaps.

1.1 Background

The approximate 240-acre sawmill property was developed by the Cascade Lumber Company in 1903, and lumber mill operations commenced in 1904 (Parametrix, 2008). The Cascade Lumber Company merged with Boise Payette Lumber Company between 1957 and 1958 to form Boise Cascade. Boise Cascade closed the mill operations in 2006, and the property is currently used for temporary log storage and for log chipping. Log storage occurs over portions of the Yakima Landfill.

A 1920 Sanborn Fire Insurance map shows three log ponds, railroad tracks that run generally east-west (still present), a boiler house, and several other buildings at the sawmill property (Parametrix, 2008). The southern log pond encompassed approximately 70 percent of the sawmill property to the south of the railroad tracks [URS Corporation (URS), 2003]. The sawmill operations gradually transitioned from using log ponds to log decks with sprinklers, and the southern log pond was drained and a large portion of the pond area was used as a landfill by the City of Yakima.

The City of Yakima reported to the Washington Department of Ecology (Ecology) that the landfill operated between 1963 and 1970 (City of Yakima, 1996); however, the Yakima County Health District has stated that the landfill was closed in 1972 (Ecology, 1996). Consistent with waste management practices at that time, the landfill was not lined. Washington's minimum functional standards for solid waste handling, Chapter 173-301 WAC, were not adopted until October 26, 1972, and they took affect at the end of November 1972. Unless the Yakima Landfill closed at the very end of 1972, Washington regulations for municipal solid waste landfills were not in affect during the landfill's operating life.

On September 26, 2009, several stacks of logs above and adjacent to the landfill area caught fire. The fire was extinguished by pumping large volumes of water onto the burning or smoldering logs and underlying wood waste for several days. This water subsequently infiltrated through the wood waste and to the groundwater table at locations within the landfill area.

1.2 Previous Site Investigations

1.2.1 1988 Hydrogeologic Study

In 1997, Ecology required Boise Cascade to conduct a hydrogeologic study of the sawmill property as part of the facility's wastewater discharge permit. In 1998, the hydrogeologic

study was conducted by Landau Associates, Inc. (Landau), and included the installation and monitoring of six groundwater monitoring wells (designated MW-5 through MW-10), as well as the monitoring of three existing groundwater monitoring wells (designated MW-1, MW-3, and MW-4). Wells MW-6, MW-7, MW-8, and MW-9 were located in the southern part of the property, near the Yakima Landfill (see Figure 2). The groundwater monitoring data showed that the general flow direction of the shallow groundwater beneath the sawmill property was consistently from the northwest to the southeast, towards the Yakima River (Landau, 1998). The Yakima River is located approximately 300 feet to the southeast of the southeastern corner of the sawmill property (see Figure 1).

1.2.2 2008 Subsurface Investigation

In 2008, Parametrix conducted a subsurface investigation at the Yakima Landfill area. The objectives of the work were to assess the groundwater conditions beneath the area, to estimate the extents of the MSW, and to assess the risks associated with methane generation and migration. The work consisted of a geophysical survey; excavating 14 test pits; drilling two soil borings; installing a groundwater monitoring well (designated MW-9A) in one of the borings to replace MW-9 (a dry well); installing soil vapor probes (designated GP-1, GP-2, and GP-3) in one of the borings and in two of the test pits; collecting groundwater samples from wells MW-7, MW-8, and MW-9A; and collecting soil vapor samples from the soil vapor probes and from all of the monitoring wells located in central and southern parts of the property. The approximate locations of the monitoring wells (in the southern part of the property only) and the soil vapor probes are shown on Figure 2. The results of the investigation showed that groundwater samples from wells MW-7, MW-8, and MW-9A contained dissolved iron and dissolved manganese concentrations that exceeded the federal secondary maximum contaminant levels (MCLs). The groundwater samples from wells MW-7 and MW-8 contained vinyl chloride concentrations below the Model Toxics Control Act (MTCA) Method A cleanup level. Combustible gas (presumably methane) concentrations above the upper explosive limit (15 percent by volume) were detected at soil vapor probes (GP-1 and GP-3) located to the north of the Yakima Landfill (Parametrix, 2008). MSW was encountered beneath the log deck; however, the lateral extents of the waste were not well defined. The log deck is located to the east and southeast of the current log barker area, and is surrounded by an asphalt road and dirt road (see Figure 2).

1.2.3 2009 Remedial Investigation

In 2009, SLR conducted a remedial investigation at the Yakima Landfill area to assess potential environmental and geotechnical conditions that could require remedial action and/or affect potential future property development, and to evaluate the land use development constraints associated with the structural capacities of the materials beneath the property. The work consisted of the following activities:

- Excavated 56 test pits (designated TP-8 through TP-63) to delineate the lateral extent of the MSW

- Drilled and sampled 41 soil borings (designated SB-1 through SB-41) to define the MSW thickness and geometry relative to native soils, fill soils, wood waste, and the groundwater table

- Installed temporary wells in 5 of the soil borings, and collected and analyzed leachate samples to assess groundwater quality beneath the landfill and to evaluate potential future construction material and method requirements

- Drilled and installed 15 soil vapor probes (designated GP-4 through GP-18), and monitored these probes and previously installed probe GP-3 to evaluate the extent of methane in subsurface soils

- Drilled and installed 3 groundwater monitoring wells (designated MW-11, MW-12, and MW-13), and collected groundwater samples from the new wells and existing wells MW-7, MW-8, and MW-9A to assess groundwater flow paths beneath the landfill area and groundwater quality upgradient and downgradient of the landfill

The locations of the test pits, borings, soil vapor probes, and monitoring wells are shown on Figure 2.

1.3 Summary of SLR Findings

Subsurface materials within the landfill area included fill materials and alluvial deposits (gravels, sands, and silts). The fill materials extend to depths of as much as 24.5 feet below ground surface (bgs) and consist of MSW, wood waste, sand, silt, gravelly silt, sandy gravel, and silty gravel. The MSW extends across a greater area than was defined by previous site investigations. The estimated limits of the MSW are shown on Figure 3. The landfill is is covered with approximately 2 to 12 feet of sandy silt, silty gravel, and/or wood waste. The MSW occurs at thicknesses of up to 15 feet, and the average thickness is approximately 10 feet. The bottom of the MSW occurs at depths ranging from approximately 5 to 19.5 feet. Based on the areal extent and thickness, approximately 408,500 cubic yards of MSW are present in the Yakima Landfill (SLR, 2009a). Most of the MSW occurs at depths above the seasonal high groundwater table.

The leachate and groundwater sample analytical results were compared to groundwater screening levels based on protection of drinking water and protection of surface water (the shallow groundwater beneath the Yakima Landfill likely discharges to the Yakima River). Preliminary groundwater IHSs were selected by comparing the maximum detected concentrations with the lowest of the drinking water and surface water screening

levels, and evaluating the frequency and patterns of detection (SLR, 2009a). Based on this evaluation, the identified preliminary groundwater IHSs for the Yakima Landfill site were:

- Arsenic
- Iron
- Manganese
- Sodium
- Nitrate
- pH
- Vinyl chloride

The IHS concentrations in groundwater samples collected in 2008 or 2009 from at least one of the existing downgradient wells (MW-7 and MW-8) were confirmed to exceed the screening levels (Parametrix, 2008 and SLR, 2009a). Since the downgradient wells are located near the southern property line, IHS concentrations exceeding the screening levels likely extend beyond the property line.

Groundwater quality data from the wells located downgradient of the MSW were compared with the data from the upgradient well MW-11. This comparison indicated that the MSW is not the primary source of the dissolved arsenic, dissolved iron, or dissolved manganese in groundwater or of the acidic groundwater (pH of less than 6.5), but may be the primary source of nitrate and dissolved sodium. The data were insufficient to determine the potential source(s) of the vinyl chloride detected during Parametrix's 2008 investigation.

Combustible gas (presumably methane) was detected in soil vapor near the landfill at concentrations up to 58.5 percent; however, the highest concentrations were detected at the soil vapor probes (GP-11 and GP-13) that are screened within wood waste. Therefore, it appears that wood waste is a significant source of methane at the landfill area (SLR, 2009a). Methane concentrations (16.2 to 32.4 percent) in soil vapor exceeded the lower explosive limit (LEL; 5 percent by volume) at locations (probes GP-4, GP-5, and GP-10) where wood waste was not present. This indicates that the MSW is also a significant source of methane (SLR, 2009a).

Unless the Yakima Landfill closed in December 1972, which is unlikely, there were no regulations that addressed landfill gas in soil; therefore, the minimal functional standards for landfilling that specifically address landfill gas do not apply to the site. However, for practical purposes, WAC 173-351-200[1] regulations for landfill gas were used for the investigation to evaluate whether the methane conditions at the site are protective of human health and the environment (SLR, 2009a). Under these regulations, as well as the

[1] Washington Department of Ecology. 1993. Chapter 173-351 WAC, Criteria for Municipal Solid Waste Landfills. October 26.

Model Toxics Control Act (MTCA) Cleanup Regulation[2], the methane concentrations generated by a landfill must not exceed the lower explosive limit (LEL; 5 percent by volume) at the property boundaries. The landfill extends beyond the eastern property line in a localized area near the southeastern corner of the property and since the soil vapor sampling results indicate that the methane concentrations in the landfill exceed the LEL, it is likely that methane concentrations exceed the LEL at the area where the waste extends beyond the eastern property line. Soil vapor sampling in February and April 2009 indicated that methane concentrations are below the LEL at the southern and western property lines; however, potential seasonal variations in soil vapor quality at these areas have not yet been defined.

Under WAC 173-351-200, methane concentrations must not exceed 25 percent of the LEL (1.25 percent by volume) inside of structures located on land used for the disposal of solid waste, and must not exceed 100 parts per million (ppm) inside of structures located on adjacent properties. Since the Yakima Landfill is located within the sawmill property and the former plywood plant building is located less than 60 feet from the landfill, it is reasonable to consider the former plywood plant to be located on land used for the disposal of solid waste rather than on an adjacent property. Combustible gas measurements were not collected in the former plywood plant building; however, methane concentrations greater than the UEL (15 percent by volume) were measured in soil vapor probes (GP-3 and GP-10) located less than 30 feet from the building. Therefore, it is likely that methane concentrations exceed the LEL in soils beneath at least portions of the building. It is also possible that methane concentrations exceed 25 percent of the LEL within portions of the building (SLR, 2009a).

[2] Washington Department of Ecology. 2001. Chapter 173-340 WAC, Model Toxics Control Act Cleanup Regulation. Amended February 12.

2 ADDITIONAL INVESTIGATION ACTIVITIES

To try to resolve the investigation data gaps described in Section 1, the additional investigation consisted of installing and sampling soil vapor probes; installing and sampling groundwater monitoring wells; collecting water samples from the Yakima River; monitoring groundwater and river water elevations; and surveying the investigation locations. The fieldwork was conducted in November 2009 and February 2010. The investigation activities were conducted in accordance with the procedures described in SLR's *Additional Investigation Work Plan, Closed City of Yakima Landfill Site, Yakima, Washington*, dated October 14, 2009.

2.1 Install Soil Vapor Probes

To collect the data necessary to try to differentiate the areas where wood waste is the primary source of methane gas from the areas where MSW is the primary source of methane gas, four soil vapor probes (designated GP-19 through GP-22) were installed on November 2, 3, 4, and 5, 2009. The locations of the probes are shown on Figure 3. GP-19, GP-20, and GP-21 are located within the footprint of the landfill at areas where there is limited surficial wood waste. GP-22 was located over 200 feet to the north of the landfill, at a location where the wood waste is over 14 feet thick (this probe was inadvertently destroyed after the November 2009 sampling event; see Section 2.2). Cascade Drilling, Inc. (Cascade), of Woodinville, Washington, installed the soil vapor probes under the direction of SLR personnel.

The boring for each vapor probe installation was drilled by using hollow-stem auger methods. Soil samples were collected at 2.5-foot intervals by using split-barrel sampling methods, and SLR continuously logged the soil encountered during drilling. The borings extended to depths of approximately 14 to 16 feet bgs. Each 1-inch-diameter Schedule 40 PVC probe was constructed with a 5-foot-long screen (0.020-inch slots) that was installed within the unsaturated zone. A blank PVC riser was attached to the screen and extended to just below the ground surface (GP-19) or to a few feet above ground surface (GP-20, GP-21, and GP-22). The top of each riser was completed with a quick-connect fitting to facilitate sample collection. The screens of GP-19, GP-20, and GP-21 were installed within MSW. The screen of GP-22 was installed within wood waste.

The bottom of each probe (including filter pack) was installed at a depth above the groundwater table. A filter pack consisting of 2x12 Colorado® silica sand was installed

from at least 6 inches below the bottom screen slot to at least 1 foot above the uppermost screen slot. A hydrated bentonite chip seal was installed above the filter pack to approximately 2 feet bgs, and at GP-19, GP-20, and GP-22, an aboveground steel casing was installed in concrete to protect the riser. Three protective steel bollards were installed around each protective casing. At GP-21, which is located in an area of truck traffic, a flush-grade, traffic-rated, steel monument was installed in concrete to protect the riser. Soil boring logs that describe the encountered materials and include the soil vapor probe construction details are presented in Appendix A.

2.2 Collect Soil Vapor Samples

On November 5, 2009 and February 3, 2010, SLR personnel extracted and analyzed soil vapors from each new soil vapor probe, except GP-22, and from previously installed probes GP-3 through GP-18 by using a CES/Landtec GEM-2000 multi-gas meter. GP-22 was only sampled in November 2009 because the probe had been accidentally destroyed by the property operations prior to February 2010. The combustible gas meter measured the percentages of oxygen, carbon dioxide, and combustible gas (reported as methane) in the extracted soil vapors. Based on the soil vapor sample analytical results (discussed below), the detected combustible gas consisted almost entirely of methane.

On November 5, 2009, after extracting soil vapors with the CES/Landtec GEM-2000 multi-gas meter, SLR collected soil vapor samples from probes GP-11, GP-13, GP-19, GP-20, GP-21, and GP-22, in laboratory-supplied bags, by using a rubber suction bulb and polyethylene tubing. Duplicate samples (designated GP-29 and GP-32) were collected from probes GP19 and GP-22, respectively. The samples were submitted to Isotech Laboratories, Inc. (Isotech) in Champaign, Illinois, for analysis. To evaluate whether the concentrations of certain constituents in gas generated by MSW differ significantly from the concentrations of those constituents in gas generated by wood waste, the soil vapor samples were analyzed for composition (nitrogen, oxygen, carbon dioxide, carbon monoxide, argon, hydrogen, helium, hydrogen sulfide, methane, ethane, ethylene, propane, isobutane, *n*-butane, isopentane, *n*-pentane, and hexanes) by using gas chromatography. The samples were also analyzed for carbon and hydrogen isotopes. Carbon isotope ratios (the ratio of ^{12}C and ^{13}C isotopes, or $\delta^{13}C$) of the methane component, and hydrogen ion isotopes (the ratio of ^{1}H and ^{2}H isotopes, or δDC) of the methane component were analyzed by using mass spectrometry. Based on the results, Isotech calculated the specific gravity and British thermal unit (BTU) of each sample.

On February 3, 2010, after extracting soil vapors with the CES/Landtec GEM-2000 multi-gas meter, SLR collected soil vapor samples from probes GP-3, GP-11, GP-13, and GP-19, in laboratory-supplied bags, by using a rubber suction bulb and polyethylene tubing. Duplicate samples (designated GP31 and GP33) were collected from probes GP11 and GP-3, respectively. The samples were submitted to Isotech for compositional

analysis. The samples were collected from GP-11, GP-13, and GP-19 to verify the November 2009 sampling results, and a sample was collected from GP-3 to identify the source of the methane concentrations near the east side of the former plywood plant building.

2.2.1 Soil Vapor Sampling Results

Unless the Yakima Landfill closed in December 1972, which is unlikely, there were no regulations that addressed landfill gas in soil; therefore, the minimal functional standards for landfilling that specifically address landfill gas do not apply to the site. However, for practical purposes, WAC 173-351-200 regulations for landfill gas and the MTCA Cleanup Regulations were used for this investigation to evaluate whether the methane conditions at the site are protective of human health and the environment.

2.2.1.1 November 2009 Samples

On November 5, 2009, the methane concentrations measured in the soil vapor probes ranged from 0 to 69.3 percent. The greatest methane concentrations (61.3 to 69.3 percent) were detected at the soil vapor probes (GP-19, GP-20, and GP-21) located within the footprint of the landfill and screened within MSW. Elevated methane concentrations (41.9 to 57.4 percent) were also detected at the probes (GP-11, GP-13, and GP-22) located to the north of the landfill that are screened within wood waste. Near the northwest, west, and southwest edges of the landfill, the methane concentrations (24.2 to 41.3 percent) also exceeded the upper explosive limit (UEL; 15 percent by volume) at probes GP-4, GP-5, GP-10, and GP-12. Further to the west and southwest, along the property line, methane was not detected (at probes GP-14 through GP-18). To the south and northeast of the landfill area (at probes GP-6 through GP-9), methane was also not detected. The combustible gas survey results from this investigation, and from the previous SLR investigation, are presented in Table 1, and the methane concentrations on November 5, 2009, are shown on Figure 4.

In November 2009, the soil vapor samples were collected from three probes screened within the footprint of the landfill (GP-19, GP-20, and GP-21) and from three probes screened within wood waste (GP-11, GP-13, and GP-22). The locations of the probes are shown on Figure 3. The soil vapor sample analytical results showed that the general characteristics of the gas generated by MSW are similar to the characteristics of the gas generated by wood waste. However, specific compositional data, such as the relative amounts of carbon dioxide (CO_2) and nitrogen, indicate that there are significant differences between the gas generated by MSW and the gas generated by wood waste. The MSW-generated gas contained lower nitrogen and CO_2 concentrations than the wood waste-generated gas. An Isotech plot of the nitrogen to methane ratios and the CO_2 to methane ratios in the samples depicts a distinct difference between the MSW-generated gas and the wood waste-generated gas. The Isotech plot is presented in Appendix B. The

soil vapor sample analytical results also showed that the analyzed methane concentrations were consistently within 4 percent of the combustible gas readings by the multi-gas meter.

Based on the soil vapor sample analytical results, it appears that the gas at probes GP-11, GP-19, GP-20, and GP-21 was generated by decomposition of MSW, and the gas at probes GP-13 and GP-22 was generated by the decomposition of wood waste. It is important to note that GP-11 is located approximately 60 feet to the north of the landfill and is screened within wood waste. A copy of the laboratory report is presented in Appendix C.

2.2.1.2 February 2010 Samples

On February 3, 2010, the methane concentrations measured in the soil vapor probes ranged from 0 to 77.7 percent. Similar to the November 2009 results, the greatest methane concentrations (69.5 to 77.7 percent) were detected at the soil vapor probes (GP-19, GP-20, and GP-21) located within the footprint of the landfill (screened within MSW). Elevated methane concentrations (62.4 and 45.4 percent) were also detected at the probes (GP-11 and GP-13, respectively) located to the north of the landfill that are screened within wood waste. Near the northwest, west, and southwest edges of the landfill, the methane concentrations (19.9 to 50.0 percent) exceeded the upper explosive limit (UEL; 15 percent by volume) at probes GP-4, GP-5, GP-10, and GP-12. Further to the west and southwest, along the property line, methane was not detected (at probes GP-14 through GP-18). To the south and northeast of the landfill area (at probes GP-6 through GP-9), methane was not detected. The methane concentrations on February 3, 2010, are shown on Figure 5.

In February 2010, the soil vapor samples were collected from one probe screened within the footprint of the landfill (GP-19) and from two probes screened within wood waste (GP-11 and GP-13) to verify the November 2009 sampling results. A sample was also collected from probe GP-3 to identify the source of the methane concentrations near the east side of the former plywood plant building. The locations of the probes are shown on Figure 3. The soil vapor sample analytical results confirmed the November 2009 results that the MSW-generated gas contains lower nitrogen and CO_2 concentrations than the wood waste-generated gas, and that the methane concentrations were consistently within 4 percent of the combustible gas readings by the multi-gas meter. The Isotech plot presented in Appendix B includes the February 2010 results. Based on the soil vapor sample analytical results, it appears that the gas at probes GP-11 and GP-19 was generated by decomposition of MSW, and the gas at probe GP-13 was generated by the decomposition of wood waste. A copy of the laboratory report is presented in Appendix C.

The samples from the soil vapor probe located near the east side of the former plywood plant building (GP-3; including duplicate sample GP33) contained nitrogen concentrations (74.64 and 74.67 percent) that were much greater than the nitrogen concentrations (0.69 to 14.87 percent) in the other soil vapor samples. The samples from GP-3 also contained CO_2 concentrations (11.21 and 11.22 percent) that were much lower than than the CO_2 concentrations (35.37 to 40.62 percent) in the other soil vapor samples. The nitrogen to methane ratios from GP-3 (5.67 and 5.70) were too high to include on the Isotech plot in Appendix B, and the CO_2 to methane ratios (0.85 and 0.86) would have plotted below the lower end of the gases from a wood waste source and above the upper end of the gases from an MSW source. Isotech evaluated the data from GP-3 and concluded that the elevated nitrogen concentrations in the soil vapors were not due to nitrogen enrichment at that location. Due to the elevated nitrogen concentrations, the source of the methane gas at GP-3 could not be identified.

2.3 Install Groundwater Monitoring Wells

To further assess the sources of the preliminary groundwater IHSs at locations hydraulically upgradient (north-northwest) of the Yakima Landfill, a groundwater monitoring well (designated MW-18) was installed approximately 270 feet to the east-northeast of upgradient well MW-11. To delineate the hydraulically downgradient extent of the preliminary groundwater IHSs and to characterize the hydraulic and geochemical interactions between site groundwater and the Yakima River, four groundwater monitoring wells (designated MW-14 through MW-17) were installed at locations to the east, south, and southeast of the sawmill property. The locations of the wells are shown on Figure 6. To the west of Highway 82, one of the wells (MW-17) is located approximately 375 feet to the south of the southeast corner of the sawmill property, on Washington State Department of Transportation (WSDOT) property, and another well (MW-16) is located approximately 880 feet south of the sawmill property, along the north end of North Fair Avenue (on City of Yakima property). The other two wells (MW-14 and MW-15) are located to the east of Highway 82, within 150 feet of the Yakima River. MW-15 is located approximately 460 feet to the east of the southeastern end of the sawmill property, on Yakima County property, and MW-14 is located approximately 1,000 feet to the southeast of the southeast corner of the sawmill property, on Yakima Greenway Foundation property. Prior to drilling, the City of Yakima obtained access agreements from WSDOT, Yakima County, and the Yakima Greenway Foundation to install the wells.

On November 2, 3, and 4, 2009, Cascade installed the groundwater monitoring wells under the direction of SLR personnel. The boring for each well installation was drilled by using hollow-stem auger methods. Soil samples were collected at 2.5-foot intervals by using split-barrel sampling methods, and SLR continuously logged the soil encountered during drilling. The borings extended to depths of approximately 14 to 21.5 feet bgs. Each 2-inch-diameter Schedule 40 PVC well was constructed with a 10- to 15-foot-long

screen (0.020-inch slots) that was installed at a depth that intercepts the groundwater table. A blank PVC riser was attached to the screen and extended to just below the ground surface (MW-14 through MW-17) or to a few feet above ground surface (MW-18). A filter pack consisting of 2x12 Colorado® silica sand was installed from at least 6 inches below the bottom screen slot to at least 1 foot above the uppermost screen slot. A hydrated bentonite chip seal was installed above the filter pack to approximately 2 feet bgs, and at MW-18, an aboveground steel casing was installed in concrete to protect the riser. Three protective steel bollards were installed around the protective casing. At MW-14, MW-15, MW-16, and MW-17, a flush-grade, traffic-rated, steel monument was installed in concrete to protect the riser. Soil boring logs that describe the encountered materials and include the monitoring well construction details are presented in Appendix A.

Cascade developed each new monitoring well by using surging and bailing methods to remove fine-grained materials and ensure hydraulic continuity between the well screen and formation materials. All drilling equipment was decontaminated by steam cleaning after completing each well.

2.4 Collect Groundwater and Surface Water Samples

To assess the groundwater contaminant concentrations beneath the Yakima Landfill area and hydraulically downgradient of the sawmill property, and to compare the geochemical characteristics of the site groundwater and the Yakima River, SLR personnel conducted groundwater sampling events on November 4 and 5, 2009, and on February 2, 3, and 4, 2010. Prior to conducting the November sampling event, SLR identified four gauging stations (designated RG-1 through RG-4) on the west bank of the Yakima River to measure the river elevations. RG-1 is located upstream of the Yakima Landfill, and RG-2, RG-3, and RG-4 are located downstream of the landfill (see Figure 7). Stations RG-1 and RG-3 are located near the bottom of the river bank to measure low seasonal river elevations, and RG-2 and RG-4 are located further up the river bank to measure higher river elevations. Yakima River stages were evaluated using stations RG-1 and RG-3 during the November 2009 and February 2010 monitoring events.

During both sampling events, groundwater samples were collected from the five new monitoring wells and from existing wells MW-7, MW-8, MW-9A, MW-11, MW-12, and MW-13 for laboratory analysis. In addition, a water sample from the Yakima River was collected at a location near the railroad tracks (at gauging station RG-1) to assess contaminant (preliminary groundwater IHS) concentrations in the river at a location upstream of the Yakima Landfill (background river concentrations). During the Febuary sampling event, duplicate samples (designated MW37 and MW38) were collected from wells MW-7 and MW-8, respectively.

During the sampling events, each well was purged and sampled by using low-flow methods with a peristaltic pump and new polyethylene tubing. During purging and immediately prior to sampling, SLR measured the pH, specific conductivity, and temperature of the purge water. Redox potential and dissolved oxygen were also typically measured; however, during the November 2009 sampling event, there were problems with the meter during the purging of several of the wells. The groundwater samples were submitted to Friedman & Bruya, Inc. (F&B) in Seattle, Washington, for analysis of the preliminary groundwater IHSs (vinyl chloride, arsenic, iron, manganese, sodium, nitrate, and pH) and additional major ions (calcium, chloride, sulfate, magnesium, and alkalinity) by using the following methods:

- Vinyl chloride by USEPA Method 8260C
- Dissolved arsenic, calcium, sodium, iron, magnesium, and manganese by USEPA Method 200.8
- Nitrate, chloride, and sulfate by USEPA Method 300.0
- pH by USEPA Method 150.1
- Alkalinity (carbonate and bicarbonate) by USEPA Method 310.1

The river water samples were analyzed for nitrate, pH, and dissolved arsenic, sodium, iron, and manganese. All of the samples for dissolved metals analysis were filtered in the field, and the samples for all other analyses were unfiltered.

2.4.1 Sample Analytical Results

The groundwater sample analytical results for the preliminary groundwater IHSs were compared to the site groundwater screening levels that were developed by SLR during the previous remedial investigation (SLR, 2009a). The selected groundwater screening levels are the lowest of the screening levels based on protection of drinking water and protection of surface water (the shallow groundwater beneath the Yakima Landfill likely discharges to the Yakima River).

2.4.1.1 November 2009 Sampling Event

The groundwater sample analytical results from the November 2009 sampling event indicated the following:

- The groundwater samples from all of the monitoring wells did not contain vinyl chloride concentrations above the method reporting limit (MRL); however, the MRL (0.2 µg/L) exceeded the groundwater screening level (0.03 µg/L).
- The groundwater samples from all of the monitoring wells contained dissolved arsenic concentrations (0.36 to 6.75 µg/L) that exceeded the groundwater screening level (0.06 µg/L). The greatest arsenic concentrations were in the

samples from upgradient wells MW-11 and MW-18. The arsenic concentrations are shown on Figure 7.

- The samples from all of the monitoring wells, except MW-9A, contained dissolved manganese concentrations (287 to 4,450 µg/L) that exceeded the groundwater screening level (50 µg/L). The manganese concentration in the sample from upgradient well MW-18 was at least 1,760 µg/L greater than the concentration in any other well. The manganese concentrations are shown on Figure 8.
- The groundwater samples from wells MW-7, MW-11, MW-12, MW-13, MW-15, MW-17, and MW-18 contained dissolved iron concentrations (1,550 to 35,400 µg/L) that exceeded the groundwater screening level (300 µg/L). The iron concentrations in the samples from upgradient wells MW-11 and MW-18 (35,400 and 26,100 µg/L, respectively) were at least 7,600 µg/L greater than the concentration in any other well. The iron concentrations are shown on Figure 9.
- The groundwater sample from well MW-8 contained a nitrate concentration (17,900 µg/L) that exceeded the groundwater screening level (10,000 µg/L). MW-8 is located near the southern (downgradient) end of the landfill (see Figure 6).
- The groundwater samples from MW-7, MW-8, MW-14, MW-16, MW-17, and MW-18 contained dissolved sodium concentrations (23,400 to 48,300 µg/L) that exceeded the groundwater screening level (20,000 µg/L). The sample from downgradient well MW-8 contained a dissolved sodium concentration that was at least 9,900 µg/L greater than the concentration in any other well. The sodium concentrations are shown on Figure 10.
- The groundwater samples from MW-7, MW-8, MW-11, and MW-18 contained pH values (6.34 to 6.47) that were more acidic than the screening level range (6.5 to 8.5). MW-11 and MW-18 are located upgradient of the landfill and MW-7 and MW-8 are located near the southern (downgradient) end of the landfill (see Figure 6).

The groundwater sample analytical results for the preliminary groundwater IHSs are presented in Table 2, and copies of the laboratory reports are presented in Appendix C.

The water sample collected from the Yakima River, at a location upstream of the landfill site, contained detectable arsenic, manganese, nitrate, and sodium concentrations (0.52, 6.96, 171, and 5,020 µg/L, respectively). The pH of the water was 6.80. The river water sample analytical results are presented in Table 3, and a copy of the laboratory report is presented in Appendix C.

2.4.1.2 February 2010 Event

The groundwater sample analytical results from the February 2010 sampling event indicated the following:

- The groundwater samples from all of the monitoring wells did not contain vinyl chloride concentrations above the MRL (0.03 µg/L).
- The groundwater samples from all of the monitoring wells contained dissolved arsenic concentrations (0.26 to 3.01 µg/L, respectively) that exceeded the groundwater screening level. Similar to the November 2009 sampling results, the greatest arsenic concentrations were in the samples from upgradient wells MW-11 and MW-18.
- The samples from all of the monitoring wells, except MW-9A and MW-14, contained dissolved manganese concentrations (192 to 6,290 µg/L) that exceeded the groundwater screening level. The samples from a well (MW-8) located near the southern end of the landfill and from an upgradient well (MW-18) contained dissolved manganese concentrations (6,290 and 5,360 µg/L, respectively) that were at least 2,780 µg/L greater than the concentration in any other well. The locations of MW-8 and MW-18 are shown on Figure 6.
- The groundwater samples from wells MW-7 (duplicate sample only), MW-11, MW-12, MW-13, MW-15, MW-17, and MW-18 contained dissolved iron concentrations (495 to 7,200 µg/L) that exceeded the groundwater screening level. Similar to the November 2009 sampling results, the greatest dissolved iron concentrations were in the samples from upgradient wells MW-11 and MW-18 (7,200 and 4,910 µg/L, respectively).
- The groundwater samples from wells MW-7 and MW-8 contained nitrate concentrations (10,300 and 95,300 µg/L, respectively) that exceeded the groundwater screening level. MW-7 and MW-8 are located near the southern (downgradient) end of the landfill.
- The groundwater samples from MW-7, MW-8, MW-16, MW-17, and MW-18 contained dissolved sodium concentrations (21,700 to 52,600 µg/L) that exceeded the groundwater screening level. Similar to the November 2009 sampling results, the sample from downgradient well MW-8 contained the greatest dissolved sodium concentration (at least 23,700 µg/L greater than the concentration in any other well).
- The groundwater samples from downgradient wells MW-7 and MW-8 contained pH values (6.23 to 6.48) that were more acidic than the screening level range.

The water sample collected from the Yakima River, at a location upstream of the landfill site, contained detectable arsenic, manganese, nitrate, and sodium concentrations (0.45, 2.72, 321, and 6,540 µg/L, respectively). The pH of the water was 8.04. The river water

sample analytical results are presented in Table 3, and a copy of the laboratory report is presented in Appendix C.

2.5 Groundwater/Surface Water Monitoring

On November 6, 2009 and February 1, 2010, SLR personnel measured the depths to groundwater in wells MW-6, MW-7, MW-8, MW-9A, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, and MW-18 by using an electronic water level meter. At the time of each groundwater elevation monitoring event, SLR also measured the depths to water at the Yakima River gauging stations where water was present by using an electronic water level meter. The depth to groundwater measurements were converted to elevations based on the results of a survey conducted by Gray Surveying & Engineering, Inc. (see Section 2.7).

On November 6, 2009, the depths to groundwater in the wells ranged from 6.19 to 19.41 feet. The depths to the river water at gauging stations RG-1 and RG-3 were 3.56 and 2.21 feet, respectively.

On February 1, 2010, the depths to groundwater in the wells ranged from 7.11 to 20.07 feet. The depths to the river water at gauging stations RG-1 and RG-3 were 2.77 and 2.32 feet, respectively. During the November 2009 and February 2010 monitoring events, the river water elevation was too low to measure the depths to the river water at stations RG-2 and RG-4. A discussion of the groundwater flow patterns and the groundwater/river water interactions is presented in Section 2.9. The depth to groundwater and river water measurements and the water elevations from this investigation, as well as from previous investigations, are presented in Table 4.

2.6 Waste Disposal

The decontamination water, development water, and sampling purge water that were generated from the investigation activities were temporarily stored at the southern part of the sawmill property in properly labeled, 55-gallon drums. After obtaining a temporary permit from the City of Yakima, the water was drained into the city's sanitary sewer system.

2.7 Surveying

Gray Surveying & Engineering, Inc., a licensed surveyor from Yakima, Washington, surveyed the vertical elevations of all of the newly installed monitoring wells and soil vapor probes, and the river elevation gauging locations. The elevations of the ground

surface at each of the new investigation locations and the elevations of the tops of the well and probe casings were surveyed to the nearest 0.01-foot, relative to the NAVD 88 datum. The elevations of the wells and river gauging locations are listed in Table 4.

2.8 Site Geology

During this investigation and the previous investigations, the subsurface materials encountered beneath the southern part of the Boise Cascade property included fill and alluvial gravel, sand, and silt. The fill materials consist of sand, silt, gravelly silt, sandy gravel, silty gravel, wood waste, and MSW. Fill materials extend to depths of as much as 24.5 feet bgs. Sandy gravel with cobbles, interpreted as native soil, is typically present below the fill materials. Locally, silty sand, silty gravel, or sandy silt occurs between the fill and sandy gravel units. Geologic cross sections that depict the general relationships between the geologic units and the landfilled waste were presented in SLR's *Renedial Investigation Report*, dated October 12, 2009.

To the south, southeast, and east of the southern end of the Boise Cascade property, the subsurface materials encountered in the borings consisted of alluvial gravel, sandy gravel, sand, and silty sand.

2.9 Site Hydrogeology

The groundwater monitoring data from the 1998 hydrogeologic study and the 2009 remedial investigation showed that the general flow direction of the shallow groundwater beneath the southern part of the Boise Cascade property was consistently to the southeast, towards the Yakima River (Landau, 1998 and SLR, 2009a). The Yakima River is located approximately 300 feet to the southeast of the southeastern corner of the landfill (see Figure 1).

Groundwater levels were monitored in monitoring wells MW-6, MW-7, MW-8, MW-9A, MW-11, MW-12, and MW-13 during February and April 2009 (SLR, 2009a), and during November 2009 and February 2010. During this period, the depths to groundwater in these monitoring wells ranged from 9.76 to 20.70 feet below the tops of the well casings (6.73 to 17.95 feet bgs). The groundwater elevations in these wells ranged from 1,038.39 to 1,055.26 feet above the NAVD 88 datum. Groundwater elevations were lowest during February 2009 in all of the wells.

Groundwater levels were also monitored at MW-14, MW-15, MW-16, MW-17, and MW-18 during November 2009 and February 2010. During this period, the depths to groundwater in these wells ranged from 7.11 to 18.03 feet below the tops of the well casings (7.18 to 15.12 feet bgs). The groundwater elevations in these wells ranged from

1,032.66 to 1,046.30 feet above the NAVD 88 datum. The depth to groundwater and groundwater elevation data from the 2009 and 2010 monitoring events, as well as from the previous groundwater monitoring events at the landfill area, are presented in Table 4. Construction details of the monitoring wells that were used for evaluating groundwater flow during this investigation are presented in Table 5.

To evaluate potential influence of the Yakima River on the groundwater beneath the Yakima Landfill, SLR monitored Yakima River water levels concurrent with groundwater monitoring during November 2009 and February 2010. The depth to water and river water elevation data are presented in Table 4.

The interpreted groundwater elevation contours for the measurements collected on November 6, 2009, are shown on Figure 11, and the elevation contours for the measurements collected on February 1, 2010, are shown on Figure 12. Beneath the landfill, the groundwater generally flows from the northwest to the southeast. Near the western edge of the landfill, groundwater flow appears to be radial from the area of well MW-13. The groundwater elevation data in this area suggest that a localized groundwater recharge source (such as the stormwater pond or a leaking underground water line) is present in the vicinity of MW-13, and that the flow from the recharge area is constrained by the relative permeabilities of surrounding soils. These interpretations are consistent with data collected during February and April 2009, and with the groundwater geochemistry results discussed below.

Based on the groundwater flow directions, the monitoring wells that are located directly upgradient of the MSW and can be used to define "background" groundwater chemistry for the local recharge area include MW-12 and MW-13. Wells MW-11 and MW-18 are located directly upgradient of the MSW and can be used to define "background" groundwater chemistry for the wood waste area to the north of the MSW. Wells that are located downgradient of the MSW (and the wood waste) include MW-7, MW-8, and MW-17. Although well MW-9A is located upgradient of the MSW, flow near MW-9A is primarily northward (radial from the recharge area that is located near MW-13) and not towards the MSW. Therefore, groundwater samples from well MW-9A are not considered representative of "background" groundwater chemistry relative to the MSW.

In 2009 and 2010, the groundwater elevations in the apparent groundwater recharge area, as measured at MW-13, ranged from approximately 1,055.26 to 1,056.33 feet above the NAVD 88 datum. Beneath the landfill (outside of the recharge area), the groundwater elevations from 1998 through 2009 ranged from approximately 1,038 to 1,047 feet above the NAVD 88 datum. A comparison of groundwater elevation data and basal elevations of the MSW show that groundwater levels are generally at or below the base of the MSW.

A comparison of the groundwater elevation data and the river elevation data shows that groundwater levels beneath the landfill area are generally higher than the Yakima River

elevations. In November 2009 and February 2010, groundwater generally flowed southeast from the landfill towards the Yakima River. However, the distribution of dissolved iron, arsenic, manganese, and sodium in the groundwater beneath the landfill area (see Figures 7 through 10) differs from the pattern that would be expected based on the groundwater flow direction observed during the 2009 and 2010 monitoring events. The distributions of dissolved iron, arsenic, manganese, and sodium in groundwater extend further south than would be anticipated. The observed distributions of these analytes indicate that historical groundwater flow directions in the landfill area were towards the south-southeast. It is possible that the gradients vary seasonally, with flow beneath the eastern portion of the landfill being more southerly during the spring and summer months. It is also possible that the local recharge area near MW-13 is a relatively recent phenomenon and has changed historic groundwater gradients beneath the landfill area.

The geochemical analytical data from the November 2009 and February 2010 sampling events indicate that Yakima River base flow differs geochemically from the area groundwater. For example, the proportion of sulfate plus chloride in the groundwater sample collected from well MW-14 in February 2010 varied by more than 10 percent from the proportion in the sample collected from MW-14 in November 2009. This variations appear to reflect seasonal mixing of Yakima River baseflow and area groundwater near this well. MW-14 is located approximately 100 feet from the river (see Figure 6). The groundwater sample analytical results for the geochemical indicators are shown in Table 6 and copies of the laboratory reports are presented in Appendix C.

The ionic character of groundwater samples from the November 2009 and February 2010 sampling events, as well as from the previous February 2009 sampling event (SLR, 2009a), were evaluated and the results are shown graphically on Figures 13, 14, and 15. These figures show that the ionic composition of the groundwater from well MW-8 was consistent with the other site wells located outside of the groundwater recharge area in February 2009, but differed significantly in November 2009 and February 2010. Specifically, all of the groundwater samples collected during the February 2009 event are dominated by bicarbonate. For the November 2009 and February 2010 events, the samples from MW-8 are not dominated by any anion or cation type, as the relative proportion of sulfate and chloride increased significantly (from less than 20 percent to approximately 60 percent), possibly in response to recharge from the water used to extinguish the September 2009 log fire. Significant changes in ionic proportions are not observed in the samples collected from the other wells in November 2009 and February 2010.

The geochemical data also indicate that groundwater samples collected from the well (MW-13) near the apparent recharge area consistently contains proportionally more calcium and less magnesium than the samples from any of the other wells. These data

suggest that the source of the groundwater recharge to the MW-13 area differs from that of other portions of the site.

3 CONCLUSIONS

From November 2009 through February 2010, SLR conducted an additional subsurface investigation of the Yakima Landfill site to try to resolve the remaining data gaps identified in Section 1. Based on the investigation results that were presented in Section 2, SLR presents the following conclusions related to the environmental conditions at the property.

- The laboratory-analyzed methane concentrations were similar (within 4 percent) to the combustible gas readings by the CES/Landtec GEM-2000 multi-gas meter; therefore, the analytical data confirm that the combustible gas detected by the meter consisted almost entirely of methane.

- The methane concentrations measured in the soil vapor probes ranged from 0 to 77.7 percent. The greatest methane concentrations (61.3 to 77.7 percent) were detected at the probes (GP-19, GP-20, and GP-21) located within the footprint of the landfill (screened within MSW). Elevated methane concentrations (41.9 to 62.4 percent) were also detected at the probes (GP-11, GP-13, and GP-22) located to the north of the landfill that are screened within wood waste. Near the northwest, west, and southwest edges of the landfill, the methane concentrations (19.9 to 50.0 percent) exceeded the upper explosive limit (15 percent by volume) at probes GP-4, GP-5, GP-10, and GP-12. Further to the west and southwest, along the property line (at probes GP-14 through GP-18), methane was not detected. To the south and northeast of the landfill area, near the property line (at probes GP-6 through GP-9), methane was also not detected.

- Since the landfill extends beyond the eastern property line in a localized area near the southeastern corner of the property and the soil vapor sampling results indicate that the methane concentrations in the landfill exceed the lower explosive limit (LEL; 5 percent by volume), the methane concentrations beyond the eastern property line (only near the southeastern corner of the property) likely exceed the LEL.

- The soil vapor sampling results from this investigation and the previous SLR investigation indicate that the methane gas concentrations have been fairly consistent and that seasonal variations in methane gas migration beneath the southern part of the sawmill property are minimal.

- The soil vapor sample analytical results showed that specific compositional data, such as the relative amounts of CO_2 and nitrogen, could be used to identify the methane gas generated by MSW and the methane gas generated by wood waste. Based on the soil vapor sample analytical results, it appears that the gas at probes located within the landfill footprint (GP-19, GP-20, and GP-21) was generated by decomposition of MSW, and the gas at two probes located to the north of the landfill (within wood waste; GP-13 and GP-22) was generated by the decomposition of wood waste. However, the gas at probe GP-11 appears to be generated by the decomposition of MSW even though it is located approximately 60 feet to the north of the landfill and is screened within wood waste. Due to anomalously high nitrogen concentrations in the soil vapor samples from probe GP-3, the source of the methane concentrations near the east side of the former plywood plant building could not be identified.

- Combustible gas measurements were not collected within the former plywood plant building; however, based on the soil vapor sampling results from this investigation and the previous SLR investigation, elevated methane concentrations (22.6 to 50 percent) were measured in a soil vapor probe (GP-10) located less than 20 feet from the southeast corner of the building. Therefore, it is likely that methane concentrations exceed the LEL in soils beneath the southern part of the building. Methane concentrations (13.2 to 19.5 percent) above the LEL were measured in a soil vapor probe (GP-3) located less than 30 feet from the east side of the building. Therefore, methane concentrations may exceed the LEL in soils beneath the eastern part of the building. It is also possible that methane concentrations exceed 25 percent of the LEL within portions of the building. Based on limited wood waste near the southern end of the building, the methane at GP-10 is likely due to decomposition of MSW. The source of the methane at GP-3 could not be determined.

- None of the groundwater samples contained vinyl chloride concentrations greater than the MRLs; however, the MRL for the November 2009 sampling event (0.2 µg/L) was slightly greater than the groundwater screening level (0.03 µg/L). Since vinyl chloride was not detected in any of the samples collected during this investigation or the previous SLR investigation, vinyl chloride was eliminated as groundwater IHS for the Yakima Landfill site.

- All of the groundwater samples contained dissolved arsenic concentrations (0.32 to 6.75 µg/L) that exceeded the groundwater screening level (0.06 µg/L). During both sampling events, the greatest arsenic concentrations were at the wells (MW-11 and MW-18) located to the north (hydraulically upgradient) of the landfill, and the concentrations steadily decreased with distance towards the Yakima River. This indicates that the source of the arsenic-impacted groundwater is located upgradient of the landfill. Since the MSW does not appear to be a source of the arsenic-

impacted groundwater, arsenic was eliminated as a groundwater IHS for the Yakima Landfill site.

- The groundwater samples from wells MW-7, MW-11, MW-12, MW-13, MW-15, MW-17, and MW-18, contained dissolved iron concentrations (417 to 35,400 µg/L) that exceeded the groundwater screening level (300 µg/L). During both sampling events, the greatest iron concentrations were at the wells (MW-11 and MW-18) located hydraulically upgradient of the landfill and the concentrations steadily decreased with distance toward the Yakima River. This indicates that the source of the iron-impacted groundwater is located upgradient of the landfill. Since the MSW does not appear to be a source of the iron-impacted groundwater, iron was eliminated as a groundwater IHS for the Yakima Landfill site.

- Since the groundwater sampling results did not indicate an increase in arsenic and iron concentrations at the southern (downgradient) end of the landfill, it appears that the arsenic and iron concentrations in the 2008 leachate samples (SLR, 2009a) are representative of background conditions (dissolved arsenic and iron concentrations from an upgradient source) and arsenic- and iron-bearing colloidal oxyhydroxides in the samples. This interpretation recognizes that the leachate samples were collected from undeveloped temporary wells and field filtered (field filtering is known to have limited effectiveness in removing colloids). The distribution of dissolved arsenic and iron in samples from developed monitoring wells indicates that there is an upgradient source of these analytes.

- All of the groundwater samples, except both samples from MW-9A and the February 2010 sample from MW-14, contained dissolved manganese concentrations (192 to 6,290 µg/L) that exceeded the groundwater screening level (50 µg/L). During the November 2009 sampling event, the greatest manganese concentration was at a well (MW-18) located hydraulically upgradient of the landfill, and the concentrations decreased with distance toward the Yakima River. During the February 2010 sampling event, the samples from a well (MW-8) located near the southern (hydraulically downgradient) end of the landfill and from upgradient well MW-18 contained the greatest manganese concentrations (6,290 and 5,360 µg/L, respectively). The sampling results indicate that the primary source of the manganese-impacted groundwater is located upgradient of the landfill; however, the MSW appears to be contributing to the manganese concentrations. Since the MSW may be a source of manganese concentrations that exceed the groundwater screening level, manganese was retained as a groundwater IHS.

- The groundwater samples from wells MW-7, MW-8, MW-14, MW-16, MW-17, and/or MW-18 contained dissolved sodium concentrations (21,700 to 52,600 µg/L) that exceeded the groundwater screening level (20,000 µg/L). During both sampling events, the greatest sodium concentrations (48,300 to 52,600 µg/L) were

at a well (MW-8) located near the southern (hydraulically downgradient) end of the landfill; however, the groundwater samples from upgradient well MW-18 also contained sodium concentrations (21,700 to 38,400 µg/L) above the screening level. The sampling results indicate that a source of sodium concentrations above the screening level is located upgradient of the landfill, and the MSW is also a significant source of sodium. Since the MSW appears to be a source of sodium concentrations that exceed the screening level, sodium was retained as a groundwater IHS.

- The manganese and sodium appear to extend to the Yakima River; however, there are no surface water cleanup levels for manganese or sodium.

- Groundwater samples from wells (MW-7 and MW-8) located near the downgradient end of the landfill contained nitrate concentrations (10,300 to 95,300 µg/L) that exceeded the groundwater screening level (10,000 µg/L). During this investigation and the previous investigations, the groundwater samples from all of the other wells did not contain nitrate concentrations greater than 3,130 µg/L. Based on the groundwater sampling results, the source of the elevated nitrate concentrations at MW-7 and MW-8 is likely MSW; therefore, nitrate was retained as a groundwater IHS. Based on the greater nitrate concentrations in the samples collected from MW-7 and MW-8 in February 2010, it appears that a slug of nitrate was leached from the landfill area when extinguishing the September 2009 log fire with a significant volume of water.

- The nitrate concentrations above the screening level likely extend beyond the southern end of the sawmill property; however, the elevated concentrations do not appear to extend beyond the neighboring JELD-WEN property.

- During the November 2009 groundwater sampling event, the groundwater samples from upgradient wells MW-11 and MW-18 and from wells located near the downgradient end of the landfill (MW-7 and MW-8) contained pH values (6.34 to 6.47) that were more acidic than the groundwater screening level range (6.5 to 8.5). During the February 2010 groundwater sampling event, the groundwater samples from downgradient wells MW-7 and MW-8 contained pH values (6.23 to 6.47) that were more acidic than the screening level range. The pH values at MW-11 and MW-18 (6.50 and 6.57, respectively) were at the bottom of the acceptable range. The groundwater sampling results indicate that the primary source of the acidic groundwater conditions is located hydraulically upgradient of the MSW; however, the MSW is contributing slightly to the acidic conditions. Since the MSW is not the primary source of the acidic groundwater conditions, pH was eliminated as a groundwater IHS for the Yakima Landfill site.

- Groundwater monitoring data indicate that the groundwater flows to the south or southeast beneath the landfill. Groundwater level data from November 2009 and February 2010 indicate that groundwater flows generally to the southeast beneath the landfill; however, based on the distribution of several groundwater analytes (iron, arsenic, manganese, and sodium), it appears that the groundwater beneath the landfill area has historically flowed to the south-southeast.

- Groundwater level data and geochemical data indicate that a source of groundwater recharge (such as the stormwater pond or a leaking underground water line) is present near MW-13. Groundwater derived from this recharge source affects groundwater flow and geochemistry beneath the landfilled area.

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

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TABLES

Table 1
Combustible Gas Survey Results
Closed City of Yakima Landfill
Yakima, Washington

Soil Vapor Probe ID	Date	Gas Concentration[a] (%)		
		Combustible Gas (Presumably Methane)	Carbon Dioxide	Oxygen
GP-3	2/24/2009	19.5	14.8	0.0
	4/17/2009	17.8	12.0	0.3
	11/5/2009	13.7	15.8	0.0
	2/3/2010	13.2	12.2	0.0
GP-4	2/25/2009	22.4	9.2	0.0
	4/17/2009	21.6	11.9	0.0
	11/5/2009	37.2	17.1	0.0
	2/3/2010	37.8	10.2	0.5
GP-5	2/25/2009	17.6	13.7	0.0
	4/17/2009	16.2	12.7	0.0
	11/5/2009	27.2	17.2	0.8
	2/3/2010	19.9	13.5	0.0
GP-6	2/25/2009	0.1	12.7	6.1
	4/17/2009	0.2	11.3	8.5
	11/5/2009	0.0	18.4	3.9
	2/3/2010	0.0	13.4	5.6
GP-7	2/25/2009	0.0	1.8	19.2
	4/17/2009	0.1	2.7	19.4
	11/5/2009	0.0	1.8	19.2
	2/3/2010	0.0	2.5	18.9
GP-8	2/25/2009	0.0	3.8	15.3
	4/17/2009	0.1	4.8	14.2
	11/5/2009	0.0	2.9	17.9
	2/3/2010	0.0	2.7	17.8
GP-9	2/25/2009	0.1	2.0	17.5
	4/17/2009	0.1	3.3	17.8
	11/5/2009	0.0	3.1	18.3
	2/3/2010	0.0	4.5	15.9
GP-10	2/25/2009	22.6	16.8	0.0
	4/17/2009	32.4	21.4	0.0
	11/5/2009	41.3	31.4	1.5
	2/3/2010	50.0	24.1	0.0
GP-11	2/25/2009	58.5	33.9	0.0
	4/17/2009	51.7	35.6	0.0
	11/5/2009	57.4	39.0	0.0
	2/3/2010	62.4	36.2	0.0

Table 1
Combustible Gas Survey Results
Closed City of Yakima Landfill
Yakima, Washington

Soil Vapor Probe ID	Date	Gas Concentration[a] (%)		
		Combustible Gas (Presumably Methane)	Carbon Dioxide	Oxygen
GP-12	2/25/2009	15.4	18.8	0.0
	4/17/2009	21.3	21.1	0.0
	11/5/2009	24.2	24.8	3.2
	2/3/2010	28.1	23.3	0.0
GP-13	2/25/2009	51.6	40.1	0.0
	4/17/2009	53.7	43.1	0.0
	11/5/2009	41.9	40.8	0.0
	2/3/2010	45.4	39.9	0.0
GP-14	4/17/2009	0.0	3.9	15.0
	11/5/2009	0.0	4.2	16.3
	2/3/2010	0.0	3.3	16.5
GP-15	4/17/2009	0.0	2.0	18.5
	11/5/2009	0.0	0.7	20.2
	2/3/2010	0.0	1.1	19.4
GP-16	4/17/2009	0.0	1.7	19.0
	11/5/2009	0.0	1.3	19.7
	2/3/2010	0.0	1.8	18.8
GP-17	4/17/2009	0.2	1.5	19.6
	11/5/2009	0.0	1.9	17.3
	2/3/2010	0.0	1.3	19.1
GP-18	4/17/2009	0.1	0.5	21.0
	11/5/2009	0.0	0.7	20.4
	2/3/2010	0.0	0.7	20.0
GP-19	11/5/2009	61.3	39.8	0.0
	2/3/2010	69.5	35.5	0.0
GP-20	11/5/2009	65.9	35.8	0.0
	2/3/2010	77.7	26.0	0.0
GP-21	11/5/2009	69.3	25.7	0.0
	2/3/2010	75.7	24.8	0.0
GP-22	11/5/2009	43.1	43.2	0.0
	2/3/2010	Not measured. Probe had been destroyed.		

Notes:

Oxygen = O_2.

The lower explosive limit (LEL) and upper explosive limit (UEL) for methane are 5 percent by volume and 15 percent by volume, respectively.

[a] Concentrations were measured by using a CES/Landtec GEM-2000 multi-gas monitor.

Table 2
Groundwater Sample Analytical Results -
Preliminary Indicator Hazardous Substances
Closed City of Yakima Landfill
Yakima, Washington

Well ID	Date[a]	Analytical Result (µg/L)						
		pH[b]	Arsenic[c]	Iron[c]	Manganese[c]	Nitrate[d]	Sodium[c]	Vinyl Chloride[e]
Lowest Groundwater Screening Level[f]		**6.5 to 8.5**	**0.06**	**300**	**50**	**10,000**	**20,000**	**0.03**
MW-7	2/6/2008	**6.49**	<50[g]	**37,500**	**2,520**	<50	**22,900**	**0.06**
	2/26/2009	**6.28**	**3.83**	**23,700**	**1,950**	1,610	19,300	<0.03
	11/4/2009	**6.45**	**3.06**	**18,500**	**2,330**	199	**22,900**	<0.2[g]
	2/4/2010	**6.47**	**0.39**	22	**1,590**	**10,300**	**28,600**	<0.03 J
MW37 (dupl. of MW-7)	2/4/2010	**6.36**	**1.20**	**851**	**1,750**	**11,200**	**28,900**	<0.03 J
MW-8	2/6/2008	6.76	<50[g]	**12,200**	**2,340**	200	**33,800**	**0.034**
	2/26/2009	6.54	<1[g]	**3,330**	**2,380**	**14,400**	**27,000**	<0.03
	11/4/2009	**6.34**	**0.98 E**	45	**2,690**	**17,900**	**48,300**	<0.2[g]
	2/4/2010	**6.28**	**0.93**	<20	**6,290**	**95,300**	**52,600**	<0.03 J
MW38 (dupl. of MW-8)	2/4/2010	**6.23**	**0.97**	<20	**6,210**	**94,700**	**51,800**	<0.03 J
MW-9A	3/25/2008	6.77	<50[g]	270	**872**	1,410	15,700	<1[g]
	2/26/2009	6.69	<1[g]	<10	<10	2,180	10,900	<0.03
`	11/4/2009	6.72	**0.93 E**	<20	13.3	3,130	11,100	<0.2[g]
`	2/4/2010	6.65	**1.00**	<20	<1	2,800	14,400	<0.03 J
MW-11	2/26/2009	**6.28**	**4.33**	**24,100**	**1,410**	33	15,300	<0.03
	11/4/2009	**6.47**	**4.80**	**35,400**	**1,890**	27	17,300	<0.2[g]
	2/4/2010	6.50	**3.01**	**7,200**	**1,610**	28	20,100	<0.03 J
MW-12	2/26/2009	**6.01**	<1[g]	**7,600**	**503**	14	10,300	<0.03
	11/4/2009	6.53	**2.01**	**5,840**	**745**	16	13,300	<0.2[g]
	2/4/2010	6.34	**0.87**	**3,000**	**767**	24	16,700	<0.03 J
MW-13	2/26/2009	**6.49**	<1[g]	**3,650**	**649**	18	10,700	<0.03
	11/4/2009	6.85	**0.36 E**	**1,550**	**287**	26	7,760	<0.2[g]
	2/4/2010	7.22	**0.26**	**495**	**192**	201	9,370	<0.03 J
MW-14	11/5/2009	6.90	**0.61 E**	63	**331**	265	**27,800**	<0.2[g]
	2/4/2010	7.19	**0.32**	<20	2.88	2,710	15,900	<0.03 J
MW-15	11/5/2009	6.61	**1.39**	**7,970**	**993**	13	9,600	<0.2[g]
	2/4/2010	6.66	**0.71**	**876**	**1,080**	15	11,300	<0.03 J
MW-16	11/5/2009	6.76	**0.77 E**	<20	**587**	306	**36,800**	<0.2[g]
	2/4/2010	6.60	**0.72**	<20	**917**	18	**23,800**	<0.03 J
MW-17	11/5/2009	6.50	**2.15**	**16,800**	**2,150**	27	**23,400**	<0.2[g]
	2/4/2010	6.67	**0.85**	**1,750**	**2,580**	806	**27,800**	<0.03 J
MW-18	11/5/2009	**6.36**	**6.75**	**26,100**	**4,450**	35	**38,400**	<0.2[g]
	2/4/2010	6.57	**2.08**	**4,910**	**5,360**	134	**21,700**	<0.03 J

Notes:

NE = Cleanup level not established.

NA = Not analyzed.

µg/L = micrograms per liter (ppb).

E = Value was reported by laboratory as an estimate because it is below the normal reporting limit.

J = Value was reported by laboratory as an estimate because it was analyzed outside of the recommended holding time. The sample initially did not contain a detectable concentration above a higher reporting limit (0.2 µg/L), and the re-analysis to a lower reporting limit was outside of the holding time.

Values in **bold** exceed the groundwater screening level.

[a] Samples collected on 2/6/2008 by Parametrix. Samples collected on 2/26/2009, 11/4/2009, 11/5/2009, and 2/4/2010 by SLR.

[b] Samples collected on 2/6/2008 analyzed for pH by EPA Method 150.1. Samples collected on 2/26/2009, 11/4/2009, 11/5/2009, and 2/4/2010 analyzed for pH by EPA Method 9040C.

[c] Samples collected on 2/6/2008 analyzed for dissolved metals by EPA Method SW6010B. Samples collected on 2/26/2009, 11/4/2009, 11/5/2009, and 2/4/2010 analyzed for dissolved metals by EPA Method 200.8.

[d] Samples analyzed for nitrate by EPA Method 300.0.

[e] Samples analyzed for vinyl chloride by EPA Method 8260C.

[f] Groundwater screening levels were the lowest selected federal maximum contaminant level (MCL) for protection of drinking water or the lowest available state water quality criteria (WQC) for protection of surface water. If an MCL or a WQC were not available, then the screening level was obtained from the MTCA Method B equation for groundwater or surface water.

[g] Method reporting limit exceeded the screening level.

Table 3
River Water Sample Analytical Results
Closed City of Yakima Landfill
Yakima, Washington

Sampling Point ID[a]	Date	Analytical Result (µg/L)					
		pH[b]	Arsenic[c]	Iron[c]	Manganese[c]	Nitrate[d]	Sodium[c]
River-1109	11/5/2009	6.80	0.52 E	<20	6.96	171	5,020
RG1-0210	2/4/2010	8.04	0.45	<20	2.72	321	6,540

Notes:

µg/L = micrograms per liter (ppb).

E = Value was reported by laboratory as an estimate because it is below the normal reporting limit.

[a]All river water samples were collected at river gauging point RG-1.

[b]Samples analyzed for pH by EPA Method 9040C.

[c]Samples analyzed for dissolved metals by EPA Method 200.8.

[d]Samples analyzed for nitrate by EPA Method 300.0.

Table 4
Groundwater and River Water Monitoring Data
Closed City of Yakima Landfill
Yakima, Washington

Measuring Point ID	Elevation[a] (feet)	Date	Depth to Water[b] (feet)	Groundwater Elevation (feet)
Groundwater Monitoring Wells				
MW-6	1059.68	7/28/1998	12.70	1046.98
		8/21/1998	12.39	1047.29
		9/21/1998	12.55	1047.13
		10/16/1998	13.34	1046.34
		10/10/2006	12.63	1047.05
		2/12/2007	14.20	1045.48
		2/7/2008	15.47	1044.21
		2/26/2009	14.94	1044.74
		4/17/2009	13.39	1046.29
		11/6/2009	14.20	1045.48
		2/1/2010	14.41	1045.27
MW-7	1049.05	7/28/1998	7.64	1041.41
		8/21/1998	7.68	1041.37
		9/21/1998	7.84	1041.21
		10/16/1998	8.45	1040.60
		10/10/2006	8.40	1040.65
		2/12/2007	10.06	1038.99
		2/7/2008	10.89	1038.16
		2/26/2009	10.66	1038.39
		4/17/2009	9.76	1039.29
		11/6/2009	9.51	1039.54
		2/1/2010	10.02	1039.03
MW-8	1051.59	7/28/1998	5.57	1046.02
		8/21/1998	5.54	1046.05
		9/21/1998	5.74	1045.85
		10/16/1998	6.19	1045.40
		2/6/2008	10.70	1040.89
		2/26/2009	10.97	1040.62
		4/17/2009	10.17	1041.42
		11/6/2009	8.77	1042.82
		2/1/2010	10.14	1041.45
MW-9A	1064.46	3/25/2008	16.85	1047.61
		2/26/2009	15.25	1049.21
		4/17/2009	12.19	1052.27
		11/6/2009	12.48	1051.98
		2/1/2010	13.80	1050.66
MW-11	1065.94	2/26/2009	20.70	1045.24
		4/17/2009	20.23	1045.71
		11/6/2009	19.41	1046.53
		2/1/2010	20.07	1045.87

Table 4
Groundwater and River Water Monitoring Data
Closed City of Yakima Landfill
Yakima, Washington

Measuring Point ID	Elevation[a] (feet)	Date	Depth to Water[b] (feet)	Groundwater Elevation (feet)
Groundwater Monitoring Wells (continued)				
MW-12	1068.53	2/26/2009	15.40	1053.13
		4/17/2009	15.34	1053.19
		11/6/2009	15.32	1053.21
		2/1/2010	15.41	1053.12
MW-13	1066.13	2/26/2009	10.87	1055.26
		4/17/2009	10.87	1055.26
		11/6/2009	10.49	1055.64
		2/1/2010	9.80	1056.33
MW-14	1041.39	11/6/2009	8.73	1032.66
		2/1/2010	8.41	1032.98
MW-15	1050.59	11/6/2009	13.12	1037.47
		2/1/2010	12.68	1037.91
MW-16	1046.84	11/6/2009	7.61	1039.23
		2/1/2010	9.36	1037.48
MW-17	1044.29	11/6/2009	6.19	1038.10
		2/1/2010	7.11	1037.18
MW-18	1063.85	11/6/2009	17.55	1046.30
		2/1/2010	18.03	1045.82
Yakima River Gauging Stations				
RG-1	1044.03	11/6/2009	3.56	1040.47
		2/1/2010	2.77	1041.26
RG-2	1041.96	11/6/2009	NM	--
		2/1/2010	NM	--
RG-3	1037.37	11/6/2009	3.75	1033.62
		2/1/2010	2.32	1035.05
RG-4	1033.42	11/6/2009	NM	--
		2/1/2010	NM	--

Notes:

[a] Elevations of top of well casings and river gauging points surveyed to NAVD 88 datum by Gray Surveying & Engineering, Inc., in February and November 2009.

[b] Depth to water measured from top of well casing or from river gauging point by using an electric water level meter.

NM = Not measured because river water was not present directly below the gauging station.

Wells MW-6, MW-7, MW-8, MW-11, MW-12, MW-13, and MW-18 are completed above ground and the top of each well casing is approximately 3 feet above the ground surface. Wells MW-9A, MW-14, MW-15, MW-16, and MW-17 are flush-grade completions. The ground surface elevation at each well location is listed in Table 5.

Table 5
Monitoring Well Construction Details
Closed City of Yakima Landfill
Yakima, Washington

Well	Top of Casing Elevation (ft)	Ground Surface Elevation (ft)	Depth to Top of Screen (ft)	Depth to Base of Screen (ft)	Depth to Top of Sand (ft)	Depth to Bottom of Boring (ft)	Top of Screen Elevation (ft)	Base of Screen Elevation (ft)	Top of Sand Elevation (ft)	Bottom of Boring Elevation (ft)
MW-6	1059.7	1056.9	9.5	19.0	6.5	20.0	1047.4	1037.9	1050.4	1036.9
MW-7	1049.1	1046.0	4.8	14.8	3.5	15.3	1041.2	1031.2	1042.5	1030.7
MW-8	1051.6	1048.6	4.5	14.8	3.5	15.0	1044.1	1033.8	1045.1	1033.6
MW-9A	1064.5	1064.9	14.0	29.0	11.0	29.0	1050.9	1035.9	1053.9	1035.9
MW-11	1065.9	1063.2	6.0	20.8	4.0	22.0	1057.2	1042.4	1059.2	1041.2
MW-12	1068.5	1065.7	6.2	21.0	4.0	22.0	1059.5	1044.7	1061.7	1043.7
MW-13	1066.1	1063.6	6.2	21.0	4.0	21.5	1057.4	1042.6	1059.6	1042.1
MW-14	1041.4	1041.3	3.1	17.7	2.0	18.0	1038.2	1023.6	1039.3	1023.3
MW-15	1050.6	1050.8	5.1	19.7	3.5	20.3	1045.7	1031.1	1047.3	1030.5
MW-16	1046.8	1047.2	3.9	13.7	3.0	14.0	1043.3	1033.5	1044.2	1033.2
MW-17	1044.3	1044.4	3.9	13.7	3.0	14.0	1040.5	1030.7	1041.4	1030.4
MW-18	1063.9	1060.9	6.6	21.2	4.0	21.5	1054.3	1039.7	1056.9	1039.4

Note:
Elevation data from surveys conducted by Gray Surveying & Engineering, Inc., in February and November 2009. Elevations relative to NAVD 88 datum.

Table 6
Groundwater Sample Analytical Results - Geochemical Indicators
Closed City of Yakima Landfill
Yakima, Washington

Well ID	Date[a]	Analytical Result				
		Alkalinity[b] (mg $CaCO_3$/L)	Chloride[c] (mg/L)	Sulfate[c] (mg/L)	Calcium[d] (mg/L)	Magnesium[d] (mg/L)
MW-7	2/6/2008	274	19.4	5.5	48.1	NA
	2/26/2009	264	20.7	<1.0	39.9	15.0
	11/4/2009	241	21.9	9.12	49.1	18.2
	2/4/2010	263	24.1	1.40	52.4	17.9
MW37 (dupl. of MW-7)	2/4/2010	264	23.6	<1.0	57.5	18.1
MW-8	2/6/2008	306	32.8	5.6	39.1	NA
	2/26/2009	284	32.8	3.02	35.4	15.6
	11/4/2009	174	108	58.0	51.4	27.6
	2/4/2010	187	111	53.3	118	54.5
MW38 (dupl. of MW-8)	2/4/2010	188	112	55.0	109	54.2
MW-9A	3/25/2008	127	15.6	17.9	29.4	NA
	2/26/2009	118	15.2	7.9	26.6	8.57
	11/4/2009	97.5	10.9	10.7	23.8	8.02
	2/4/2010	118	13.1	12.7	26.8	8.92
MW-11	2/26/2009	216	11.9	<1.0	30.0	10.7
	11/4/2009	202	13.5	<1.0	44.8	14.5
	2/4/2010	196	11.9	<1.0	31.6	11.0
MW-12	2/26/2009	67.5	7.62	6.17	9.14	3.53
	11/4/2009	84.0	6.96	<1.0	14.2	4.32
	2/4/2010	98.4	10.6	3.68	17.4	5.67
MW-13	2/26/2009	136	6.06	4.63	31.7	3.55
	11/4/2009	72.4	6.26	1.89	19.1	1.83
	2/4/2010	57.4	6.33	12.5	18.0	1.64
MW-14	11/5/2009	117	35.4	12.1	17.3	8.29
	2/4/2010	62.2	29.8	14.6	19.9	7.33
MW-15	11/5/2009	123	8.27	<1.0	18.1	8.32
	2/4/2010	128	10.9	<1.0	23.5	8.68
MW-16	11/5/2009	190	28.5	110	49.4	18.6
	2/4/2010	192	26.7	10.6	37.8	12.2
MW-17	11/5/2009	236	18.0	<1.0	35.4	13.8
	2/4/2010	284	22.3	3.12	47.8	16.5
MW-18	11/5/2009	345	37.0	1.69	49.7	24.4
	2/4/2010	356	19.7	<1.0	69.4	25.2

Notes:

mg/L = milligrams per liter (ppm).

Values in **bold** exceed the groundwater screening level or are outside of the screening level range (pH only).

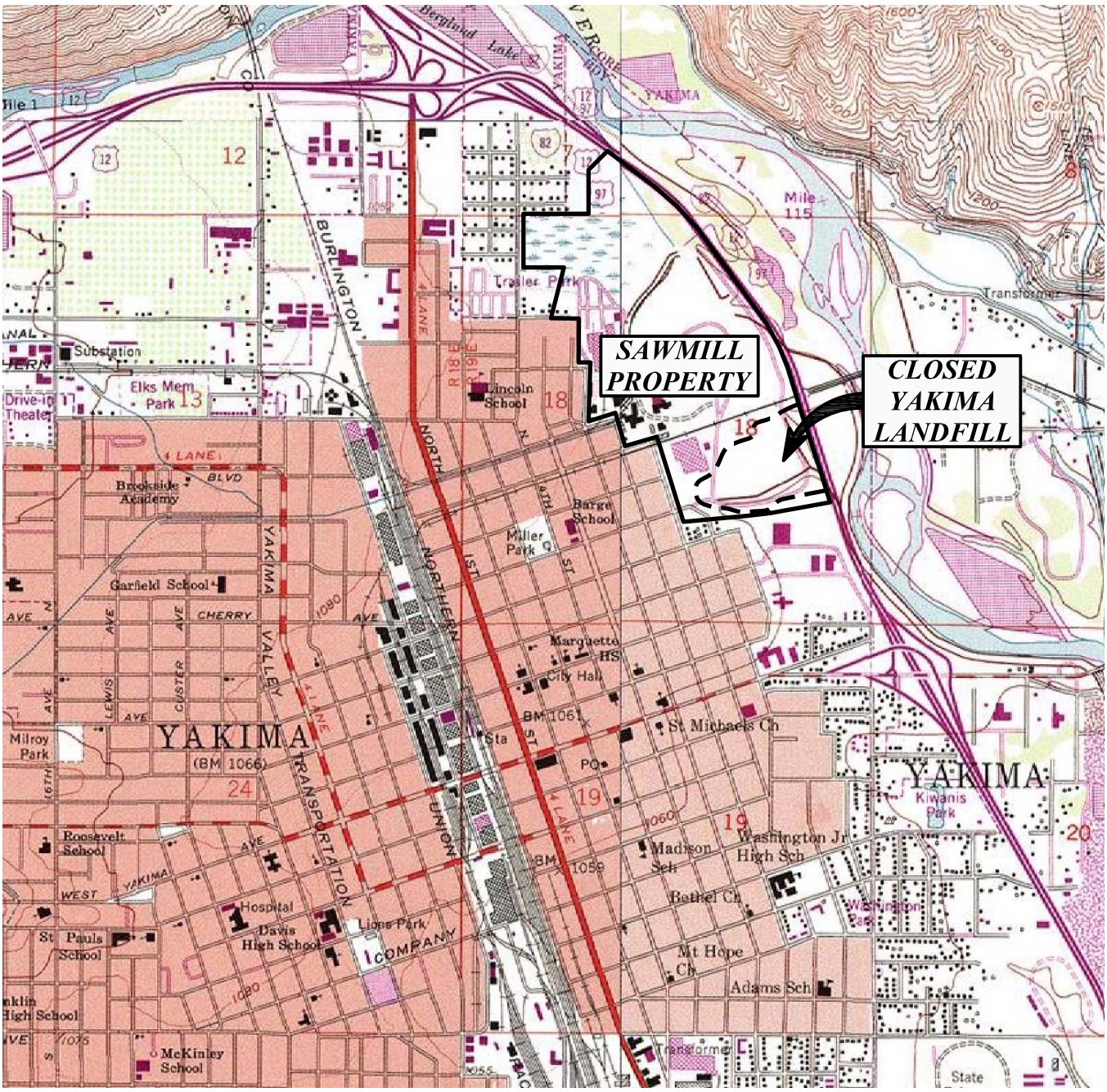
[a] Samples collected on 2/6/2008 by Parametrix. Samples collected on 2/26/2009 by SLR.

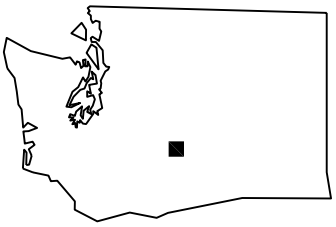
[b] Samples collected on 2/6/2008 analyzed for alkalinity by EPA Method SM 2320. Samples collected on 2/26/2009, 11/4/2009, and 11/5/2009 analyzed for alkalinity by EPA Method 310.1.

[c] Samples collected on 2/6/2008 analyzed for chloride by EPA Method 325.2 and sulfate by EPA Method 375.2. Samples collected on 2/26/2009, 11/4/2009, and 11/5/2009 analyzed for chloride and sulfate by EPA Method 300.0.

[d] Samples analyzed for calcium and magnesium by EPA Method 200.8.

FIGURES





WASHINGTON

0 2000 4000

SCALE IN FEET

SOURCE: USGS 7.5 Minute Quadrangle Yakima West and Yakima East, 1985 Contour Interval 20 Feet.

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FIGURE 1
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

LANDFILL LOCATION MAP

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LEGEND

- TP-11 ⊠ 2009 TEST PIT LOCATION AND DESIGNATION
- MW-12 ⊕ 2009 MONITORING WELL LOCATION AND DESIGNATION
- GP-5 ⊗ 2009 SOIL VAPOR PROBE LOCATION AND DESIGNATION
- SB-17 ● 2009 SOIL BORING LOCATION AND DESIGNATION
- MW-9 ⊕ PRE-2009 MONITORING WELL LOCATION AND DESIGNATION
- GP-3 ◑ 2008 SOIL VAPOR PROBE LOCATION AND DESIGNATION
- PROPERTY LINE
- ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
- RAILROAD TRACKS
- FENCE

EAST "G" St.
EAST "F" St.
EAST "E" St.
N. 8th St.
PROPERTY LINE
FORMER PLYWOOD PLANT
BARKER AREA
DIRT ROAD
ASPHALT
ASPHALT ROAD
ELEVATED CHIP BINS
LOG DECK
STORMWATER POND
DRAINAGE SWALE
DRAINAGE DITCH
HIGHWAY 82
OFF-RAMP
GATE
FENCE
PROPERTY LINE
ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE

MW-6, GP-1, MW-11, TP-13, TP-14, GP-6, SB-26, TP-11, TP-58, TP-57, GP-13, TP-42, TP-41, TP-46, TP-60, TP-10, TP-9, TP-61, SB-25, SB-30, TP-8, TP-47, TP-48, SB-29, TP-62, GP-11, TP-49, TP-54, TP-55, TP-56, TP-50, TP-53, SB-24, TP-40, TP-59, MW-9A, MW-9, GP-3, MW-12, SB-21, SB-20, TP-51, SB-19, TP-52, SB-41, SB-18, SB-23, TP-45, SB-40, GP-16, TP-39, SB-38, SB-39, SB-22, STORMWATER POND, GP-10, TP-63, TP-38, SB-37, SB-36, GP-2, SB-27, SB-11, TP-36, TP-37, SB-12, SB-35, MW-13, TP-35, GP-4, SB-10, SB-34, SB-16, SB-17, SB-31, SB-32, SB-33, SB-15, TP-12, GP-17, TP-34, SB-14, TP-44, ASPHALT, SB-13, SB-8, SB-3, SB-2, SB-1, GATE, TP-33, SB-7, TP-29, SB-4, SB-9, TP-31, TP-30, SB-6, TP-21, TP-20, TP-19, TP-18, TP-17, TP-16, GP-5, TP-32, SB-28, SB-5, TP-22, GP-8, GP-7, TP-15, GP-12, TP-28, TP-27, TP-26, TP-25, TP-23, TP-24, MW-8, MW-7, GP-18, FENCE, GP-15, GP-14, GP-9, PROPERTY LINE

0 200 400
SCALE IN FEET

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FIGURE 2
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

PREVIOUS INVESTIGATION LOCATIONS

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LEGEND

- GP-5 ⊗ 2009 SOIL VAPOR PROBE LOCATION AND DESIGNATION
- GP-3 ◑ 2008 SOIL VAPOR PROBE LOCATION AND DESIGNATION
- PROPERTY LINE
- ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
- RAILROAD TRACKS
- FENCE

EAST "G" St.
PROPERTY LINE
GP-16
EAST "F" St.
N. 8th St.
EAST "E" St.
GP-17
GP-18
FORMER PLYWOOD PLANT
GP-3
BARKER AREA
GP-22
GP-13
GP-11
DIRT ROAD
ASPHALT
ELEVATED CHIP BINS
STORMWATER POND
GP-10
GP-21
GP-4
ASPHALT
GATE
GP-5
GP-12
FENCE
GP-15
GP-14
PROPERTY LINE
LOG DECK
GP-6
DRAINAGE SWALE
ASPHALT ROAD
DRAINAGE DITCH
GP-20
GP-19
ASPHALT ROAD
ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
GP-8
GP-7
GP-9
PROPERTY LINE
HIGHWAY 82
OFF-RAMP

0 200 400
SCALE IN FEET

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FIGURE 3
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

SOIL VAPOR PROBE LOCATIONS

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LEGEND

GP-5 ⊗ 2009 SOIL VAPOR PROBE LOCATION AND DESIGNATION

GP-3 ◑ 2008 SOIL VAPOR PROBE LOCATION AND DESIGNATION

(57.4%) PERCENTAGE OF COMBUSTIBLE GAS (PRESUMABLY METHANE) BY VOLUME IN SOIL VAPOR SAMPLES COLLECTED ON NOVEMBER 5, 2009

PROPERTY LINE

ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE

RAILROAD TRACKS

FENCE

NOTE:

THE FLAMMABLE RANGE OF METHANE IS APPROXIMATELY 5% (LOWER EXPLOSIVE LIMIT) TO 15% (UPPER EXPLOSIVE LIMIT) BY VOLUME IN AIR.

EAST "G" St.
EAST "F" St.
EAST "E" St.
N. 8th St.
HIGHWAY 82
OFF-RAMP
PROPERTY LINE
FORMER PLYWOOD PLANT
BARKER AREA
ASPHALT
DIRT ROAD
ELEVATED CHIP BINS
LOG DECK
DRAINAGE DITCH
DRAINAGE SWALE
ASPHALT ROAD
STORMWATER POND
GATE
FENCE
ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE

GP-3 (13.7%)
GP-4 (37.2%)
GP-5 (27.2%)
GP-6 (0.0%)
GP-7 (0.0%)
GP-8 (0.0%)
GP-9 (0.0%)
GP-10 (41.3%)
GP-11 (57.4%)
GP-12 (24.2%)
GP-13 (41.9%)
GP-14 (0.0%)
GP-15 (0.0%)
GP-16 (0.0%)
GP-17 (0.0%)
GP-18 (0.0%)
GP-19 (61.3%)
GP-20 (65.9%)
GP-21 (69.3%)
GP-22 (43.1%)

0 200 400
SCALE IN FEET

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FIGURE 4
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

COMBUSTIBLE GAS CONCENTRATIONS - NOVEMBER 5, 2009

LEGEND

- GP-5 ⊗ — 2009 SOIL VAPOR PROBE LOCATION AND DESIGNATION
- GP-3 ◑ — 2008 SOIL VAPOR PROBE LOCATION AND DESIGNATION
- GP-22 ⊗ — DESTROYED SOIL VAPOR PROBE LOCATION AND DESIGNATION
- (62.4%) — PERCENTAGE OF COMBUSTIBLE GAS (PRESUMABLY METHANE) BY VOLUME IN SOIL VAPOR SAMPLES COLLECTED ON FEBRUARY 3, 2010
- PROPERTY LINE
- ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
- RAILROAD TRACKS
- FENCE

NOTE:

THE FLAMMABLE RANGE OF METHANE IS APPROXIMATELY 5% (LOWER EXPLOSIVE LIMIT) TO 15% (UPPER EXPLOSIVE LIMIT) BY VOLUME IN AIR.

EAST "G" St.
EAST "F" St.
EAST "E" St.
N. 8th St.
PROPERTY LINE
FORMER PLYWOOD PLANT
BARKER AREA
ASPHALT
DIRT ROAD
ELEVATED CHIP BINS
LOG DECK
DRAINAGE DITCH
DRAINAGE SWALE
ASPHALT ROAD
HIGHWAY 82
OFF-RAMP
STORMWATER POND
ASPHALT
GATE
FENCE
ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
PROPERTY LINE

GP-16 (0.0%)
GP-3 (13.2%)
GP-22
GP-13 (45.4%)
GP-11 (62.4%)
GP-6 (0.0%)
GP-10 (50.0%)
GP-21 (75.7%)
GP-4 (37.8%)
GP-17 (0.0%)
GP-20 (77.7%)
GP-19 (69.5%)
GP-5 (19.9%)
GP-12 (28.1%)
GP-18 (0.0%)
GP-15 (0.0%)
GP-14 (0.0%)
GP-9 (0.0%)
GP-8 (0.0%)
GP-7 (0.0%)

0 200 400
SCALE IN FEET

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FIGURE 5
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

COMBUSTIBLE GAS CONCENTRATIONS - FEBRUARY 3, 2010

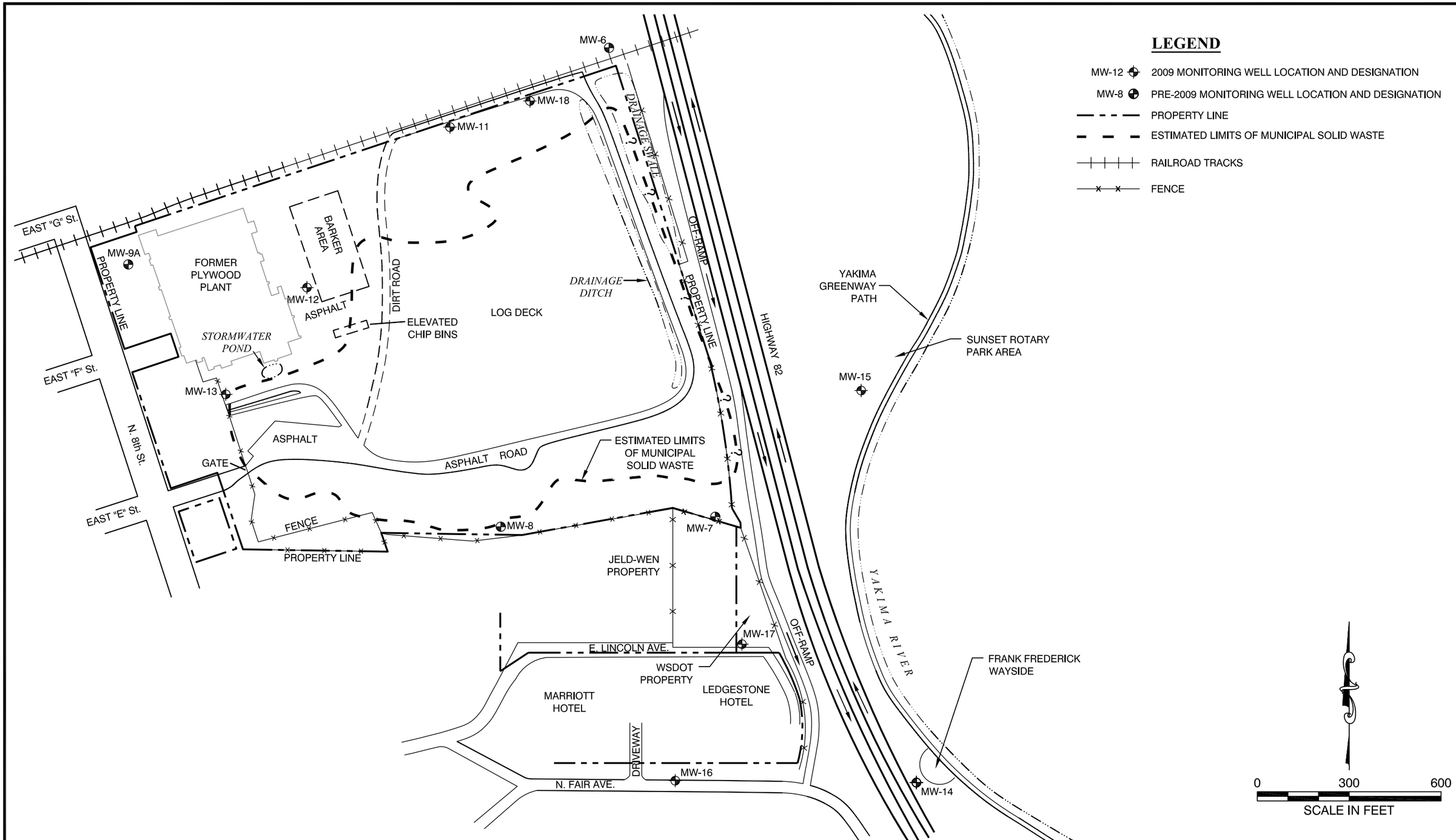

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FIGURE 6
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

GROUNDWATER MONITORING WELL LOCATIONS

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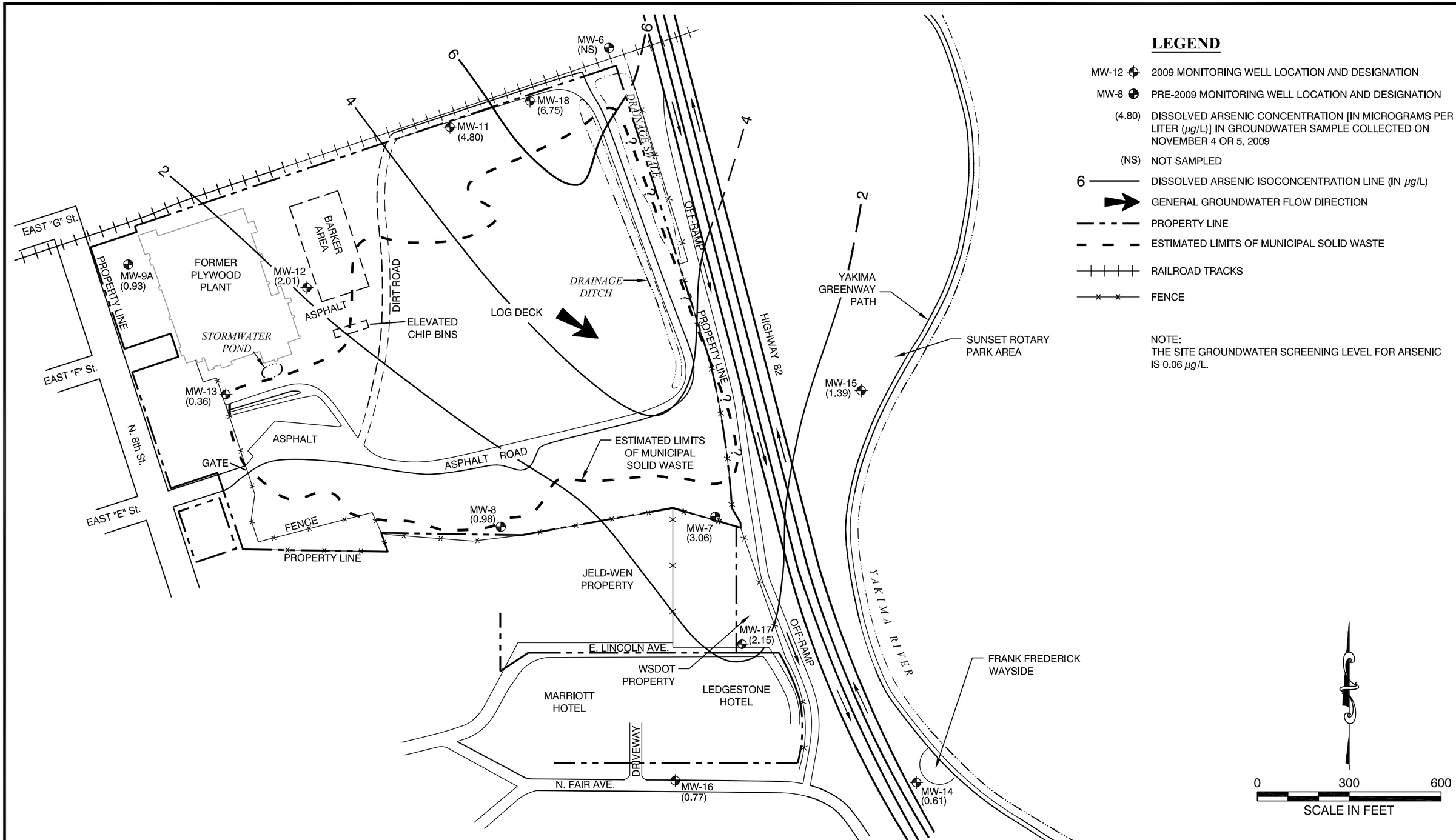

LEGEND

- MW-12 — 2009 MONITORING WELL LOCATION AND DESIGNATION
- MW-8 — PRE-2009 MONITORING WELL LOCATION AND DESIGNATION
- (4.80) — DISSOLVED ARSENIC CONCENTRATION [IN MICROGRAMS PER LITER ($\mu g/L$)] IN GROUNDWATER SAMPLE COLLECTED ON NOVEMBER 4 OR 5, 2009
- (NS) — NOT SAMPLED
- 6 — DISSOLVED ARSENIC ISOCONCENTRATION LINE (IN $\mu g/L$)
- GENERAL GROUNDWATER FLOW DIRECTION
- PROPERTY LINE
- ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
- RAILROAD TRACKS
- FENCE

NOTE:
THE SITE GROUNDWATER SCREENING LEVEL FOR ARSENIC IS 0.06 $\mu g/L$.

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FIGURE 7
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

DISSOLVED ARSENIC CONCENTRATIONS - NOVEMBER 2009

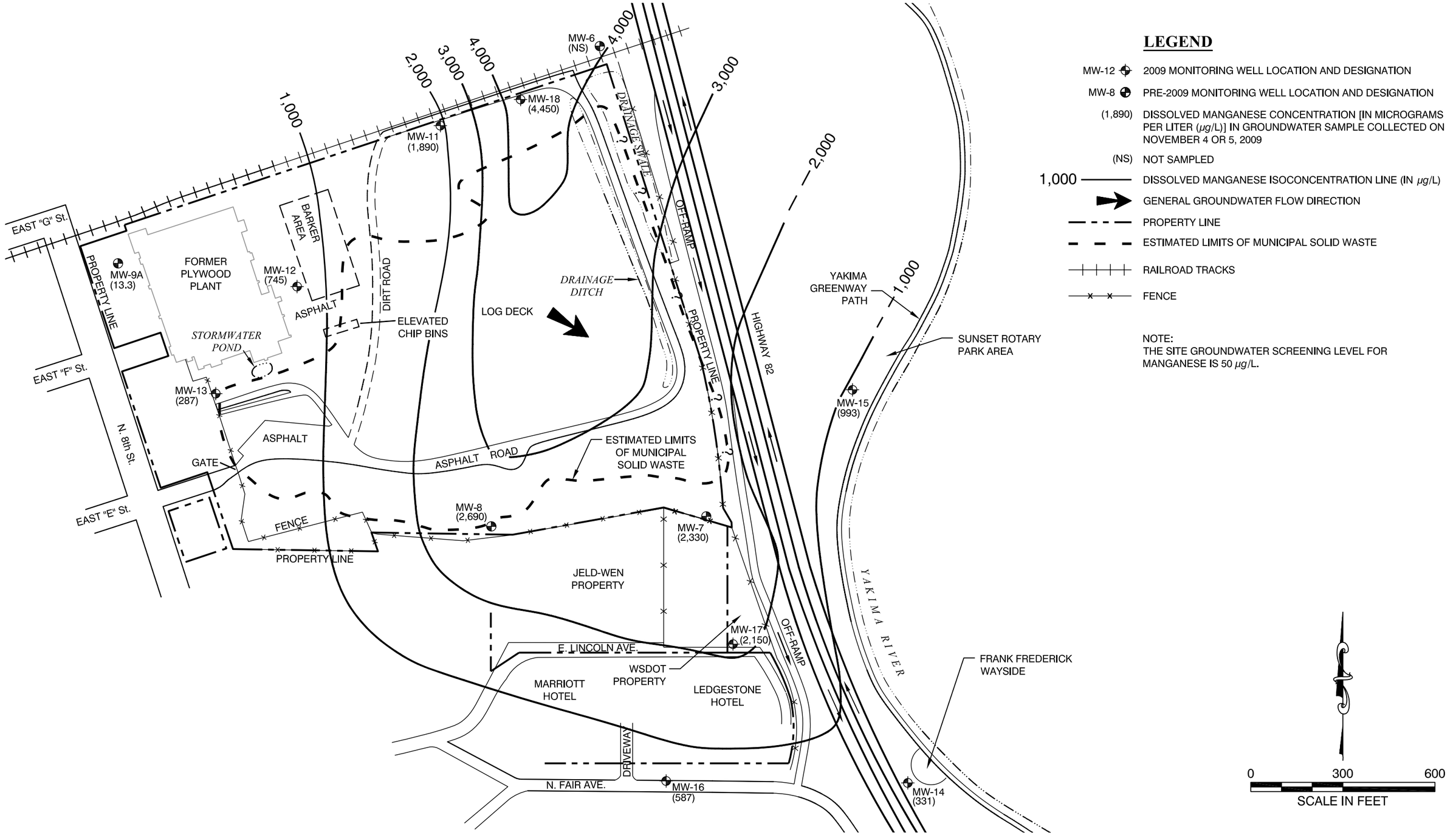

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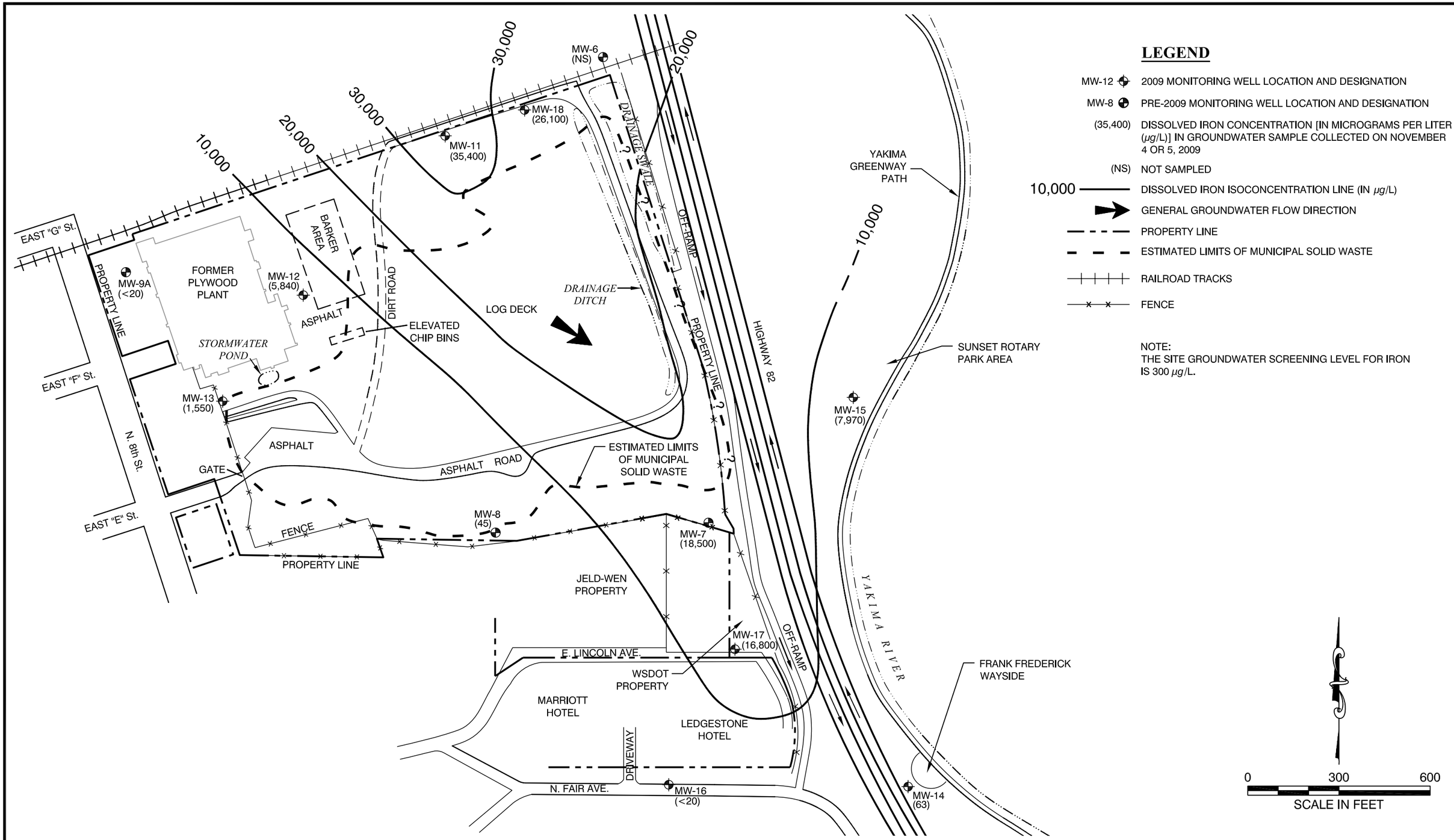
FIGURE 8
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

DISSOLVED MANGANESE CONCENTRATIONS - NOVEMBER 2009



LEGEND

- MW-12 — 2009 MONITORING WELL LOCATION AND DESIGNATION
- MW-8 — PRE-2009 MONITORING WELL LOCATION AND DESIGNATION
- (35,400) — DISSOLVED IRON CONCENTRATION [IN MICROGRAMS PER LITER (µg/L)] IN GROUNDWATER SAMPLE COLLECTED ON NOVEMBER 4 OR 5, 2009
- (NS) — NOT SAMPLED
- 10,000 — DISSOLVED IRON ISOCONCENTRATION LINE (IN µg/L)
- GENERAL GROUNDWATER FLOW DIRECTION
- PROPERTY LINE
- ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
- RAILROAD TRACKS
- FENCE

NOTE:
THE SITE GROUNDWATER SCREENING LEVEL FOR IRON IS 300 µg/L.

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FIGURE 9
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

DISSOLVED IRON CONCENTRATIONS - NOVEMBER 2009

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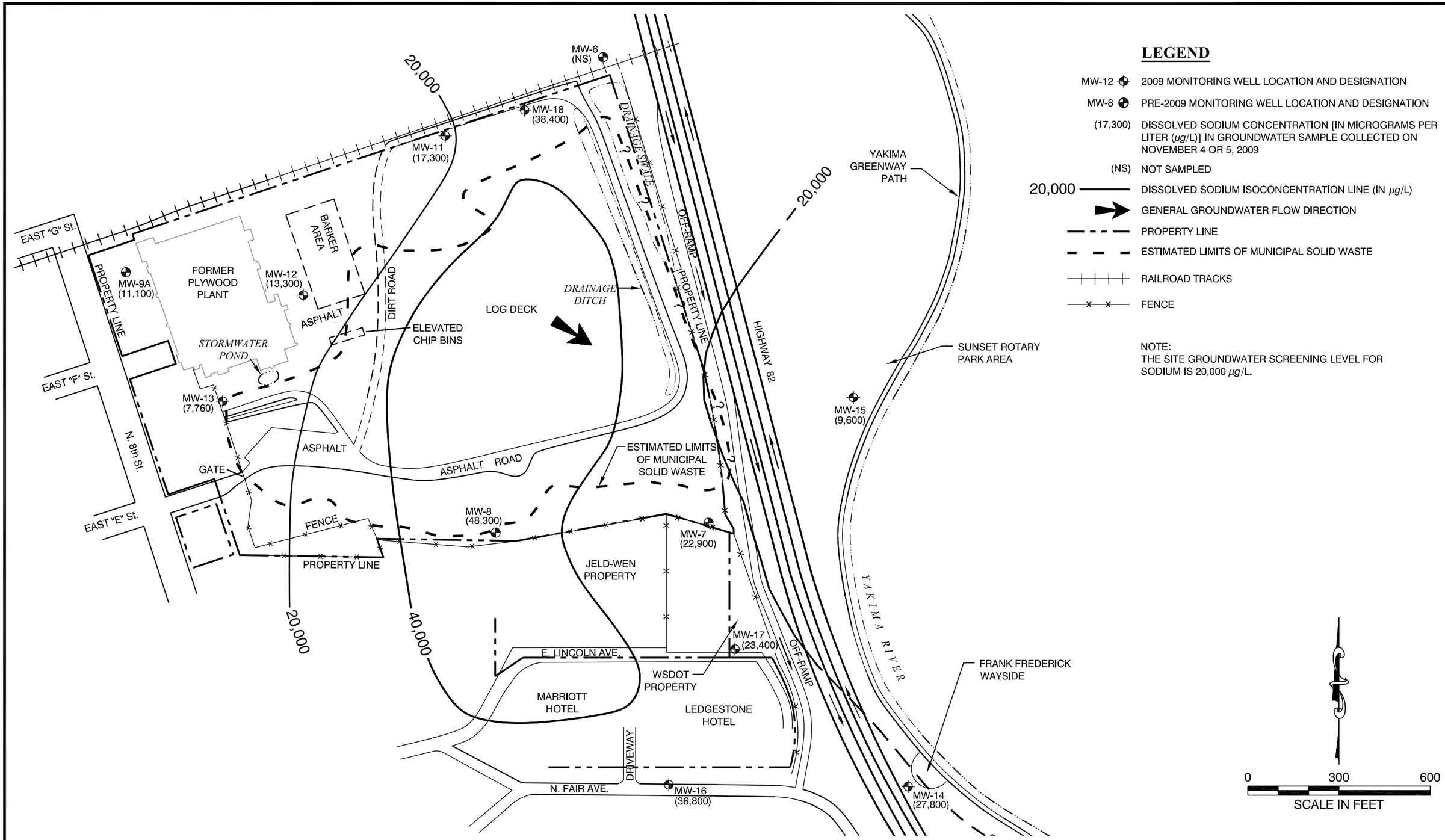

LEGEND

- MW-12 — 2009 MONITORING WELL LOCATION AND DESIGNATION
- MW-8 — PRE-2009 MONITORING WELL LOCATION AND DESIGNATION
- (17,300) — DISSOLVED SODIUM CONCENTRATION [IN MICROGRAMS PER LITER (μg/L)] IN GROUNDWATER SAMPLE COLLECTED ON NOVEMBER 4 OR 5, 2009
- (NS) — NOT SAMPLED
- 20,000 — DISSOLVED SODIUM ISOCONCENTRATION LINE (IN μg/L)
- GENERAL GROUNDWATER FLOW DIRECTION
- PROPERTY LINE
- ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
- RAILROAD TRACKS
- FENCE

NOTE:
THE SITE GROUNDWATER SCREENING LEVEL FOR SODIUM IS 20,000 μg/L.

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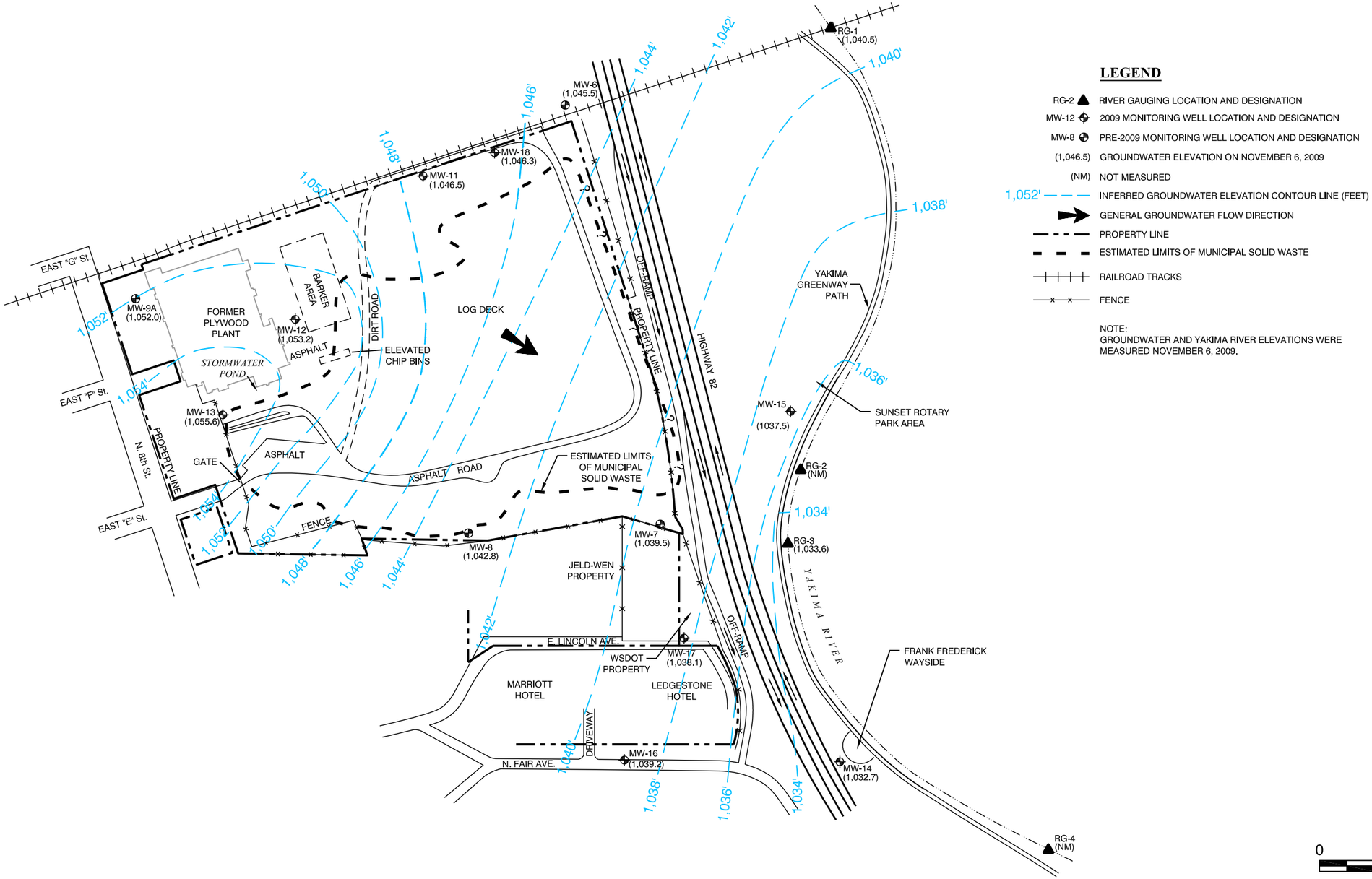
FIGURE 10
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

DISSOLVED SODIUM CONCENTRATIONS - NOVEMBER 2009



LEGEND

- RG-2 ▲ RIVER GAUGING LOCATION AND DESIGNATION
- MW-12 ⊕ 2009 MONITORING WELL LOCATION AND DESIGNATION
- MW-8 ⊕ PRE-2009 MONITORING WELL LOCATION AND DESIGNATION
- (1,046.5) GROUNDWATER ELEVATION ON NOVEMBER 6, 2009
- (NM) NOT MEASURED
- 1,052' INFERRED GROUNDWATER ELEVATION CONTOUR LINE (FEET)
- GENERAL GROUNDWATER FLOW DIRECTION
- PROPERTY LINE
- ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
- RAILROAD TRACKS
- FENCE

NOTE:
GROUNDWATER AND YAKIMA RIVER ELEVATIONS WERE MEASURED NOVEMBER 6, 2009.

0 400 800
SCALE IN FEET

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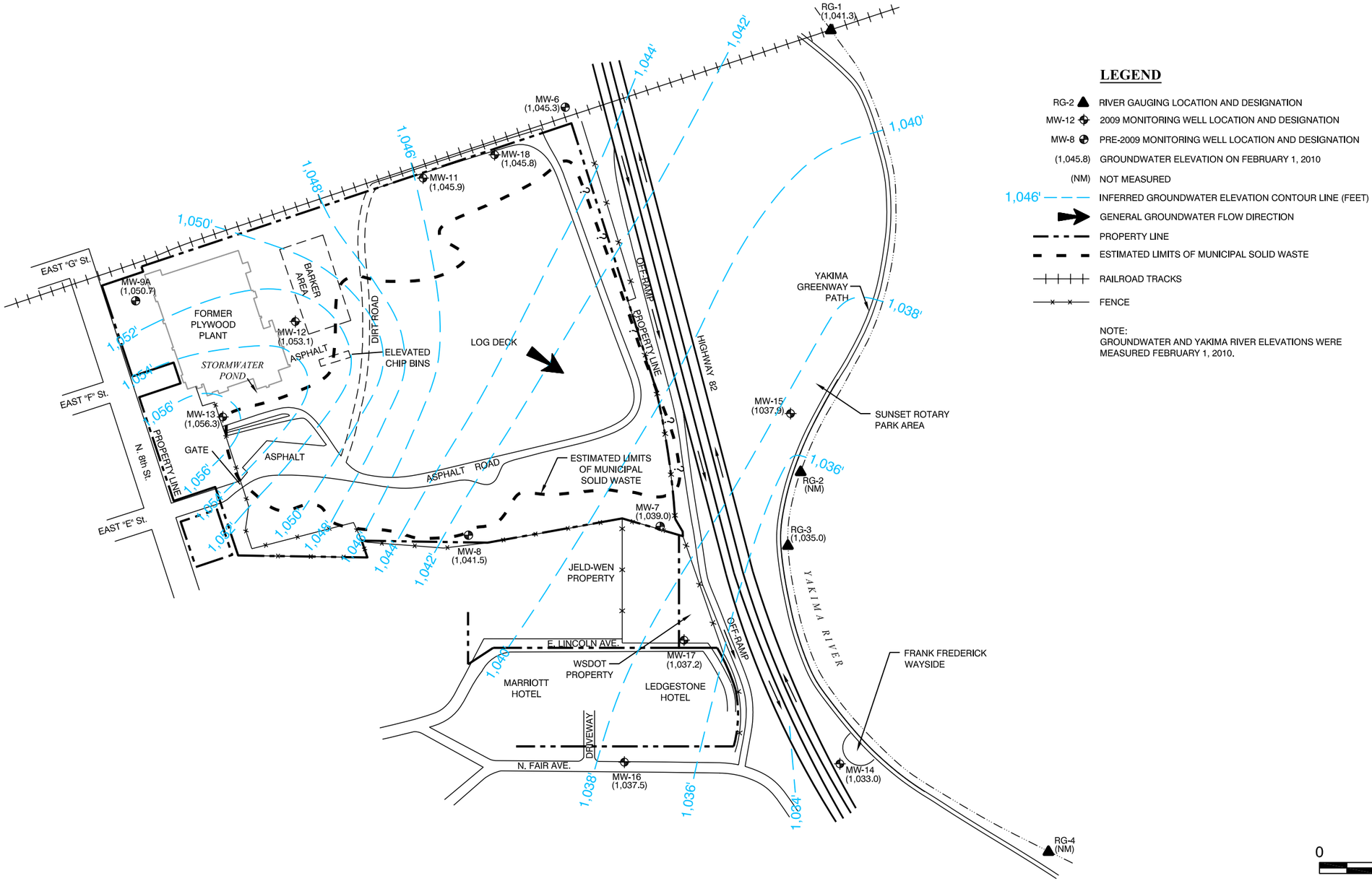
FIGURE 11
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

GROUNDWATER ELEVATION CONTOUR MAP - NOVEMBER 2009



LEGEND

- RG-2 — RIVER GAUGING LOCATION AND DESIGNATION
- MW-12 — 2009 MONITORING WELL LOCATION AND DESIGNATION
- MW-8 — PRE-2009 MONITORING WELL LOCATION AND DESIGNATION
- (1,045.8) — GROUNDWATER ELEVATION ON FEBRUARY 1, 2010
- (NM) — NOT MEASURED
- 1,046' — INFERRED GROUNDWATER ELEVATION CONTOUR LINE (FEET)
- GENERAL GROUNDWATER FLOW DIRECTION
- PROPERTY LINE
- ESTIMATED LIMITS OF MUNICIPAL SOLID WASTE
- RAILROAD TRACKS
- FENCE

NOTE:
GROUNDWATER AND YAKIMA RIVER ELEVATIONS WERE MEASURED FEBRUARY 1, 2010.

0 400 800
SCALE IN FEET

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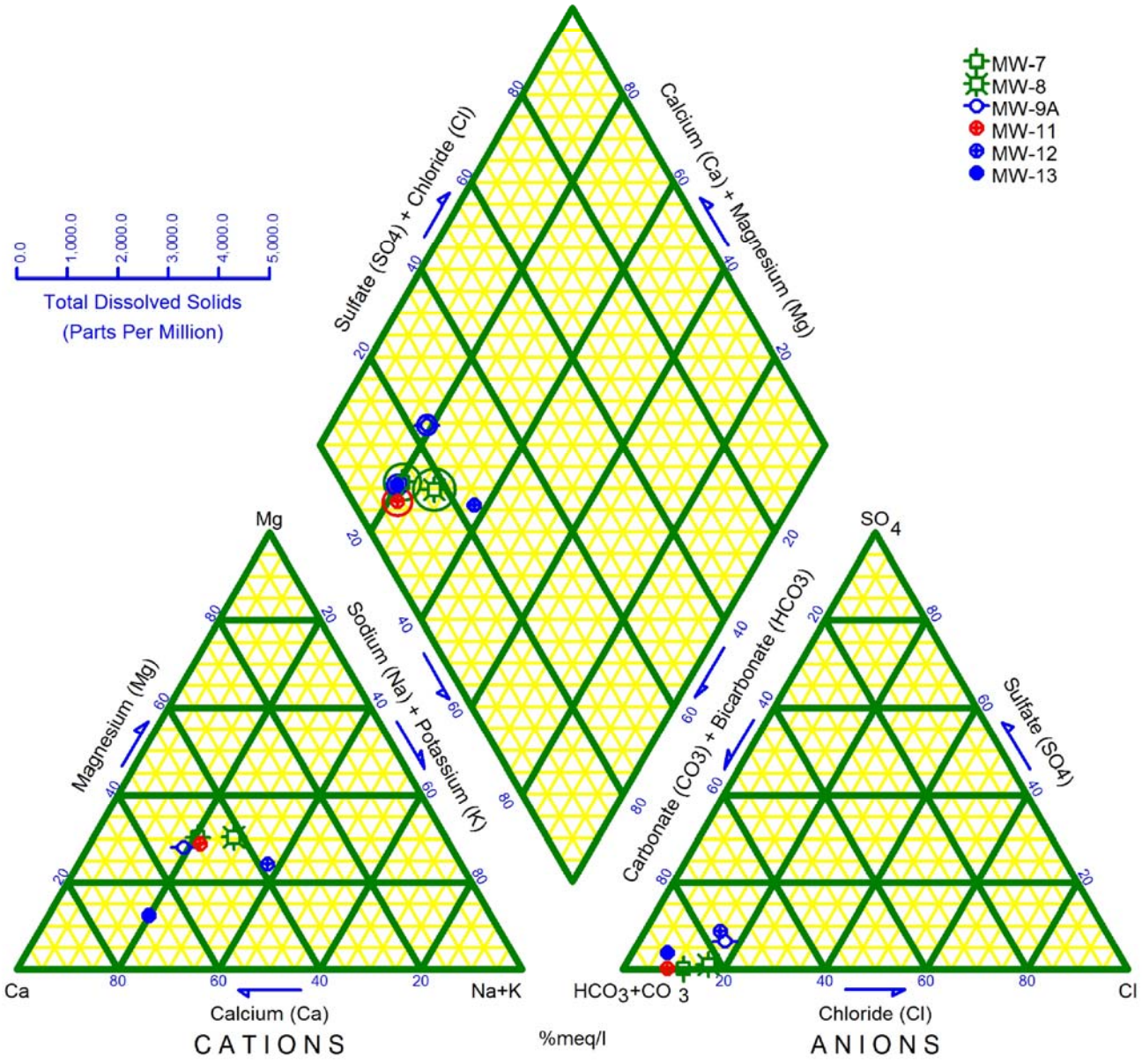
FIGURE 12
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

GROUNDWATER ELEVATION CONTOUR MAP - FEBRUARY 2010



SLR International Corp 22122 20th AVE SE BLDG. H, SUITE 150 BOTHELL, WA 98021 T: 425-402-8800 F: 425-402-8488	DATE 03/10 DWN. BDT APPR. _____ REVIS. _____ PROJECT NO. 001.0221.00006	FIGURE 13 CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL YAKIMA, WASHINGTON **IONIC EVALUATION - FEBRUARY 2009 GROUNDWATER SAMPLES**

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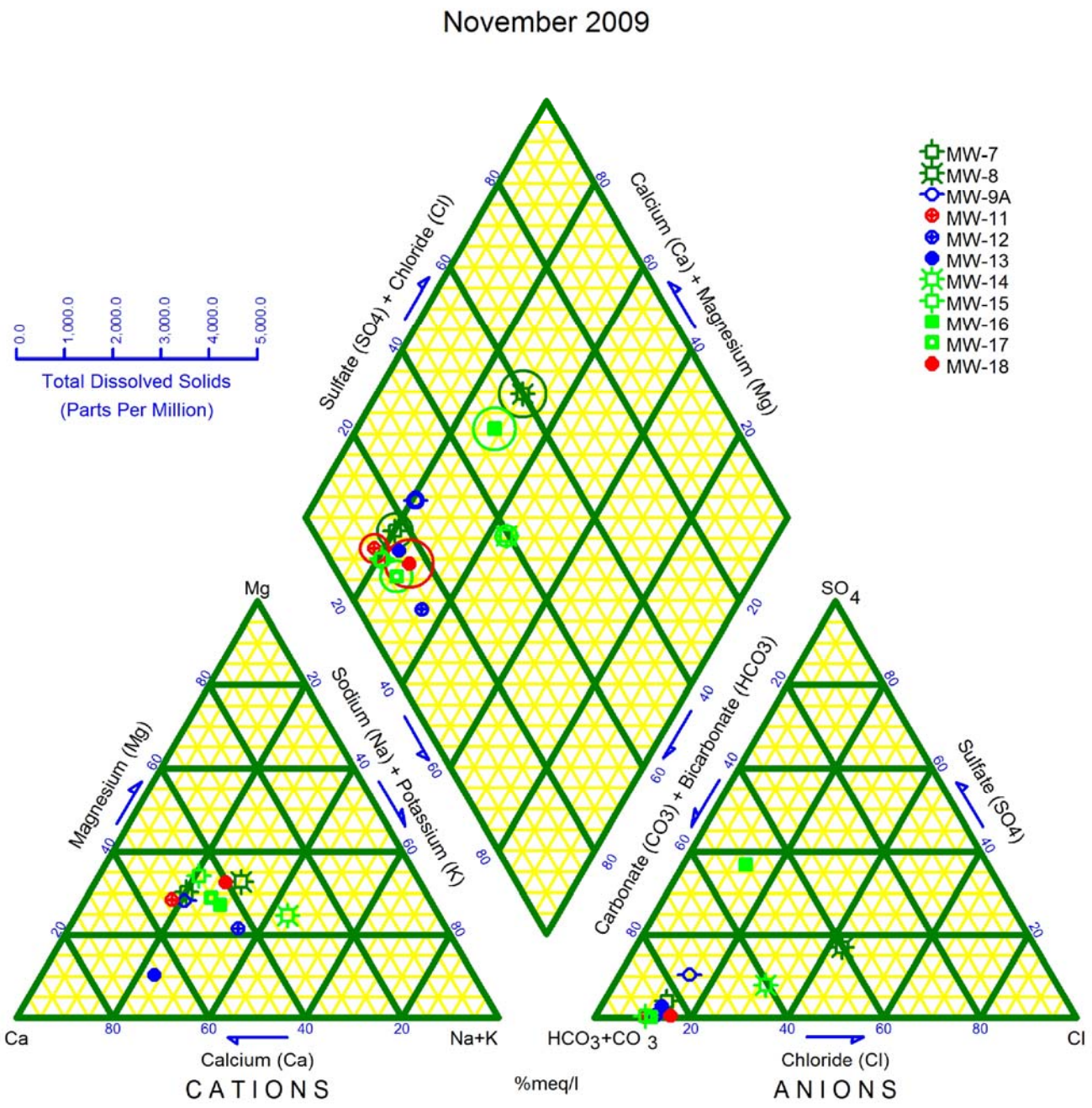

SLR International Corp 22122 20th AVE SE BLDG. H, SUITE 150 BOTHELL, WA 98021 T: 425-402-8800 F: 425-402-8488	DATE 03/10 DWN. BDT APPR. _____ REVIS. _____ PROJECT NO. 001.0221.00006	FIGURE 14 CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL YAKIMA, WASHINGTON **IONIC EVALUATION - NOVEMBER 2009** **GROUNDWATER SAMPLES**

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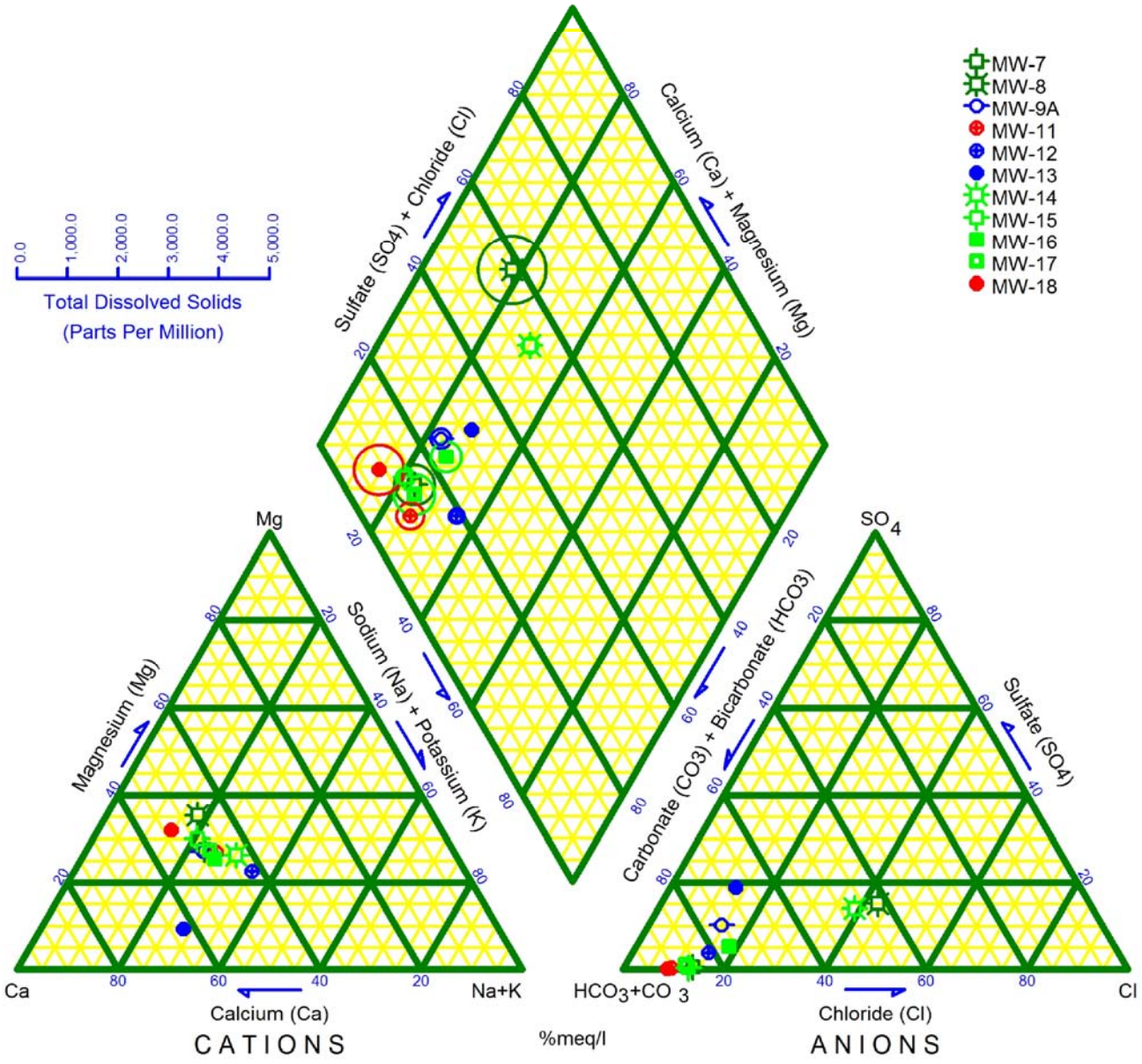

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BLDG. H, SUITE 150
BOTHELL, WA 98021
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APPR. _____
REVIS. _____
PROJECT NO.
001.0221.00006

FIGURE 15
CLOSED CITY OF YAKIMA MUNICIPAL LANDFILL
YAKIMA, WASHINGTON

IONIC EVALUATION - FEBRUARY 2010
GROUNDWATER SAMPLES

APPENDIX A

SOIL BORING LOGS

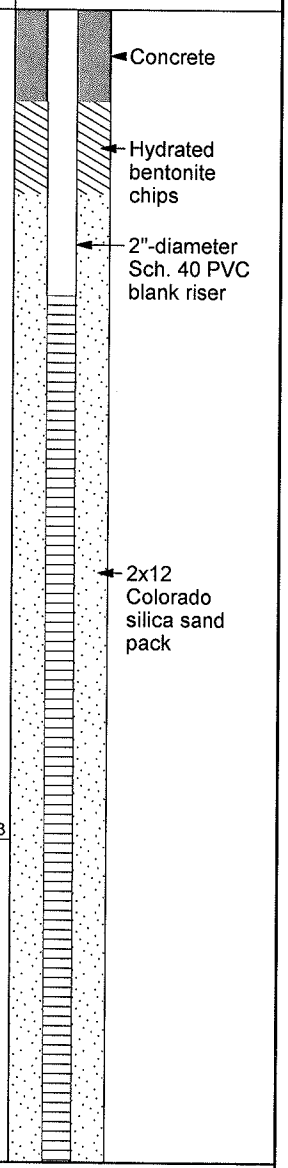
SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

WELL NUMBER MW-14

CLIENT City of Yakima
PROJECT NAME Former City of Yakima Landfill
PROJECT NUMBER 001.0221.00006
PROJECT LOCATION Yakima, Washington
DATE STARTED 11/4/09 **COMPLETED** 11/4/09
GROUND ELEVATION 1041.25 ft **HOLE SIZE** 8.5" Diameter
DRILLING DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 10.0 ft / Elev 1031.3 ft
LOGGED BY C. Lee **CHECKED BY**
AT END OF ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0								**GRAVEL**, gray, medium- to coarse-grained, some cobbles, trace fine-grained sand, very dense, dry to damp.
2.5		D&M		100	50/2"	GP		
5.0		D&M		0	50/4"			@ 5.0 feet: No recovery.
7.5		D&M		100	50/1"			
9.0								1032.3
10.0		D&M		100	50/3"	GP		**SANDY GRAVEL**, grayish brown, fine- to coarse-grained, some cobbles, little fine- to coarse-grained sand, trace fines, very dense, damp to ▽ wet.
12.5								

WELL DIAGRAM



REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

(Continued Next Page)

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22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
SLR International Corp Fax: 425.402.8488

WELL NUMBER MW-14

CLIENT City of Yakima **PROJECT NAME** Former City of Yakima Landfill

PROJECT NUMBER 001.0221.00006 **PROJECT LOCATION** Yakima, Washington

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
12.5									
	X	D&M		100	50/6"			**SANDY GRAVEL**, grayish brown, fine- to coarse-grained, some cobbles, little fine- to coarse-grained sand, trace fines, very dense, damp to wet. *(continued)*	
15.0									
	X	D&M		100	50/6"	GP			2"-diameter Sch. 40 PVC 0.020"-slotted screen
17.5									
	X	D&M		100	50/6"			18.0	1023.3 End cap

Boring completed at 18.0 feet.

WELL COMPLETION DETAILS:

0 to 3.1 feet: 2"-diameter Sch. 40 PVC blank riser.
3.1 to 17.7 feet: 2"-diameter Sch. 40 PVC 0.020"-slotted screen.
17.7 to 18 feet: 2"-diameter Sch. 40 PVC end cap.

0 to 1 feet: Concrete.
1 to 2 feet: Hydrated bentonite chips.
2 to 18 feet: 2x12 Colorado silica sand.

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

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SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

WELL NUMBER MW-15

CLIENT City of Yakima
PROJECT NAME Former City of Yakima Landfill
PROJECT NUMBER 001.0221.00006
PROJECT LOCATION Yakima, Washington
DATE STARTED 11/4/09 **COMPLETED** 11/4/09
GROUND ELEVATION 1050.78 ft **HOLE SIZE** 8.5" Diameter
DRILLING DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 14.0 ft / Elev 1036.8 ft
LOGGED BY C. Lee **CHECKED BY**
AT END OF ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0.0								**BARK CHIPS.**	Concrete
								1.0 — 1049.8	
								SAND, light brown, fine-grained, few fine gravel, loose to medium dense, dry.	
2.5									
		D&M		20	13	SP			Hydrated bentonite chips
5.0									2"-diameter Sch. 40 PVC blank riser
		D&M		5	17				
7.5								7.0 — 1043.8	
		D&M		70	27	SM		**SILTY SAND**, reddish brown, fine-grained, little gray silt, medium dense, damp, mottled.	
								9.5 — 1041.3	2x12 Colorado silica sand pack
10.0								**GRAVELLY SAND**, reddish brown, fine-grained, some fine to coarse gravel, medium dense to very dense, damp.	
		D&M		10	41	SP			
12.5									

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

(Continued Next Page)

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SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

WELL NUMBER MW-15

CLIENT City of Yakima **PROJECT NAME** Former City of Yakima Landfill

PROJECT NUMBER 001.0221.00006 **PROJECT LOCATION** Yakima, Washington

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
12.5									
	X	D&M		90	50/5"	SP		**GRAVELLY SAND**, reddish brown, fine-grained, some fine to coarse gravel, medium dense to very dense, damp. *(continued)*	
								14.0 ▽ 1036.8	
								GRAVEL, gray, fine- to coarse-grained, few coarse-grained sand, trace fines, wet, landfill odor.	
15.0									
	X	D&M		50	50/4"	GW			
								16.5 1034.3	
								GRAVELLY SAND, gray, fine- to coarse-grained, some fine to coarse gravel, trace fines, very dense, wet, landfill odor.	
17.5									
	X	D&M		100	50/5"	SW			
20.0									
	X	D&M		100	50/4"			20.4 1030.4	

2"-diameter Sch. 40 PVC 0.020"-slotted screen

End cap

Boring completed at 20.4 feet.

WELL COMPLETION DETAILS:

0 to 5.1 feet: 2"-diameter Sch. 40 PVC blank riser.
5.1 to 19.7 feet: 2"-diameter Sch. 40 PVC 0.020"-slotted screen.
19.7 to 20 feet: 2"-diameter Sch. 40 PVC end cap.

0 to 1.5 feet: Concrete.
1.5 to 3.5 feet: Hydrated bentonite chips.
3.5 to 20.4 feet: 2x12 Colorado silica sand.

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

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SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

WELL NUMBER MW-16

CLIENT City of Yakima
PROJECT NAME Former City of Yakima Landfill
PROJECT NUMBER 001.0221.00006
PROJECT LOCATION Yakima, Washington
DATE STARTED 11/3/09 **COMPLETED** 11/3/09
GROUND ELEVATION 1047.17 ft **HOLE SIZE** 8.5" Diameter
DRILLING DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 7.0 ft / Elev 1040.2 ft
LOGGED BY C. Lee **CHECKED BY**
AT END OF ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0.0								0.5 **ASPHALT.** 1046.7	Concrete
						GP		**SANDY GRAVEL**, brown, medium- to coarse-grained, some fine- to coarse-grained sand, damp.	
								1.5 1045.7	
2.5								**GRAVEL**, brown, medium- to coarse-grained, some cobbles, few fine- to coarse-grained sand, very dense, damp.	Hydrated bentonite chips
	X	D&M		100	50/6"	GP			2"-diameter Sch. 40 PVC blank riser
								4.0 1043.2	
5.0								**SANDY GRAVEL**, brown, fine- to medium-grained, little fine- to medium-grained sand, very dense, damp.	
	X	D&M		100	50/5"	GP			
								6.5 1040.7	
7.5								**GRAVEL**, gray, coarse-grained, some cobbles, very ▽ dense, damp to wet. @ 7.0 feet: Becomes wet.	2x12 Colorado silica sand pack
	X	D&M		0	50/6"	GP		@ 7.5 feet: No recovery.	
								9.0 1038.2	
10.0								**SAND**, brown, fine- to medium-grained, few medium gravel, very dense, wet.	2"-diameter Sch. 40 PVC 0.020"-slotted screen
	X	D&M		100	50/6"	SP			
								11.5 1035.7	
12.5						SP		**GRAVELLY SAND**, brown, medium- to coarse-grained, some fine to medium gravel, trace fines, very dense, wet.	

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

(Continued Next Page)

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SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

WELL NUMBER MW-16

CLIENT City of Yakima **PROJECT NAME** Former City of Yakima Landfill

PROJECT NUMBER 001.0221.00006 **PROJECT LOCATION** Yakima, Washington

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
12.5									
	X	D&M		100	50/6"	SP		**GRAVELLY SAND**, brown, medium- to coarse-grained, some fine to medium gravel, trace fines, very dense, wet. *(continued)*	
								14.0 1033.2	End cap

Boring completed at 14.0 feet.

WELL COMPLETION DETAILS:

0 to 3.9 feet: 2"-diameter Sch. 40 PVC blank riser.
3.9 to 13.7 feet: 2"-diameter Sch. 40 PVC 0.020"-slotted screen.
13.7 to 14 feet: 2"-diameter Sch. 40 PVC end cap.

0 to 1.5 feet: Concrete.
1.5 to 3 feet: Hydrated bentonite chips.
3 to 14 feet: 2x12 Colorado silica sand.

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

WELL NUMBER MW-17

CLIENT City of Yakima
PROJECT NAME Former City of Yakima Landfill
PROJECT NUMBER 001.0221.00006
PROJECT LOCATION Yakima, Washington
DATE STARTED 11/3/09 **COMPLETED** 11/3/09
GROUND ELEVATION 1044.36 ft **HOLE SIZE** 8.5" Diameter
DRILLING DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 7.0 ft / Elev 1037.4 ft
LOGGED BY C. Lee **CHECKED BY**
AT END OF ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0.0						GP		**SANDY GRAVEL**, brown, medium- to coarse-grained, little fine- to medium-grained sand, damp.	Concrete
								1.0 — 1043.4	
								GRAVELLY SAND, brown, fine- to medium-grained, little fine to medium gravel, few fines, dense, damp to moist.	
2.5						SP			Hydrated bentonite chips
		D&M		30	32				2"-diameter Sch. 40 PVC blank riser
								4.5 — 1039.9	
5.0								**SANDY GRAVEL**, brown, fine- to coarse-grained, some fine-grained sand, dense, moist.	
		D&M		30	38	GP			
								7.0 ▽ — 1037.4	2x12 Colorado silica sand pack
7.5								**GRAVEL**, gray, medium- to coarse-grained, some cobbles, trace fines, very dense, wet.	
		D&M		50	50/5"	GP			
								@ 9.0 feet: Auger refusal. Moved boring three feet west and resumed drilling.	
								9.5 — 1034.9	2"-diameter Sch. 40 PVC 0.020"-slotted screen
10.0								**SAND**, gray, medium- to coarse-grained, few fine gravel, very dense, wet.	
		D&M		50	50/6"	SP			
								11.5 — 1032.9	
12.5						GP		**SANDY GRAVEL**, gray, fine- to medium-grained, little fine- to coarse-grained sand, trace fines, wet.	

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

(Continued Next Page)

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SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

WELL NUMBER MW-17

CLIENT City of Yakima **PROJECT NAME** Former City of Yakima Landfill

PROJECT NUMBER 001.0221.00006 **PROJECT LOCATION** Yakima, Washington

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
12.5									
	X	D&M		50	50/5"	GP		**SANDY GRAVEL**, gray, fine- to medium-grained, little fine- to coarse-grained sand, trace fines, wet. *(continued)*	
								14.0 1030.4	End cap

Boring completed @ 14.0 feet.

WELL COMPLETION DETAILS:

0 to 3.9 feet: 2"-diameter Sch. 40 PVC blank riser.
3.9 to 13.7 feet: 2"-diameter Sch. 40 PVC 0.020"-slotted screen.
13.7 to 14 feet: 2"-diameter Sch. 40 PVC end cap.

0 to 1.5 feet: Concrete.
1.5 to 3 feet: Hydrated bentonite chips.
3 to 14 feet: 2x12 Colorado silica sand.

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

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SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

WELL NUMBER MW-18

CLIENT City of Yakima
PROJECT NAME Former City of Yakima Landfill
PROJECT NUMBER 001.0221.00006
PROJECT LOCATION Yakima, Washington
DATE STARTED 11/2/09 **COMPLETED** 11/2/09
GROUND ELEVATION 1060.94 ft **HOLE SIZE** 8.5" Diameter
DRILLING DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 12.0 ft / Elev 1048.9 ft
LOGGED BY C. Lee **CHECKED BY**
AT END OF ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0.0						WW		**WOOD WASTE**, large bark chips, sawdust, damp.	Concrete
								1.5 — 1059.4	
								SAND, dark brown, fine-grained, trace fine to medium gravel, medium dense, damp.	
2.5						SP			
	X	D&M		30	29				Hydrated bentonite chips
								4.5 — 1056.4	
5.0								**WOOD WASTE**, small bark chips, sawdust, dense, damp.	
	X	D&M		100	31				2"-diameter Sch. 40 PVC blank riser
						WW			
7.5								@ 7.0 feet: Becomes moist.	
	X	D&M		30	35				
								@ 8.5 feet: Some gray silt.	
								9.5 — 1051.4	
10.0								**SAND**, gray, very fine-grained, medium dense, few silt, moist.	2x12 Colorado silica sand pack
	X	D&M		100	38	SP			
								12.0 ▽ — 1048.9	
12.5						ML		**SILT**, gray, little very fine-grained sand, medium stiff, wet, rotten egg odor.	

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

(Continued Next Page)

SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

WELL NUMBER MW-18

CLIENT City of Yakima **PROJECT NAME** Former City of Yakima Landfill

PROJECT NUMBER 001.0221.00006 **PROJECT LOCATION** Yakima, Washington

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
12.5									
		D&M		100	5	ML		**SILT**, gray, little very fine-grained sand, medium stiff, wet, rotten egg odor. *(continued)*	
								14.5 — 1046.4	
15.0								**SILTY SAND**, gray, fine-grained, some fines, very loose, wet, rotten egg odor.	
		D&M		100	3	SM			
17.5									
		D&M		0	4			@ 17.5 feet: No recovery.	2"-diameter Sch. 40 PVC 0.020"-slotted screen
								19.5 — 1041.4	
20.0								**GRAVEL**, gray, medium-grained, trace fines, loose, wet.	
		D&M		70	7	GP			
								21.5 — 1039.4	End cap

Boring completed at 21.5 feet.

WELL COMPLETION DETAILS:

+2.9 to 6.6 feet: 2"-diameter Sch. 40 PVC blank riser.
6.6 to 21.2 feet: 2"-diameter Sch. 40 PVC 0.020"-slotted screen.
21.2 to 21.5 feet: 2"-diameter Sch. 40 PVC end cap.

0 to 2 feet: Concrete.
2 to 4 feet: Hydrated bentonite chips.
4 to 21.5 feet: 2x12 Colorado silica sand.

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

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SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

PROBE NUMBER GP-19

CLIENT City of Yakima
PROJECT NAME Former City of Yakima Landfill
PROJECT NUMBER 001.0221.00006
PROJECT LOCATION Yakima, Washington
DATE STARTED 11/4/09 **COMPLETED** 11/4/09
GROUND ELEVATION 1060.71 ft **HOLE SIZE** 8.5" Diameter
DRILLING DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 14.5 ft / Elev 1046.2 ft
LOGGED BY C. Lee **CHECKED BY**
AT END OF ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PROBE DIAGRAM
0.0						WW		0.5 **WOOD WASTE**, sawdust, bark, ash. 1060.2	Concrete
						SM		**SILTY SAND**, dark reddish-brown, fine-grained, little fines, few fine gravel, very moist.	
2.5								2.0 1058.7 **MUNICIPAL SOLID WASTE**, medium dense, moist.	
		D&M		30	30			@ 2.5 feet: Paper, wood, glass.	
5.0									Hydrated bentonite chips
		D&M		60	22			@ 5 feet: Fiber, wood, soil/decomposable (50% by volume).	
7.5						MSW			
		D&M		60	18			@ 7.5 feet: Paper, plastic, soil/decomposable (20% by volume).	1"-diameter Sch. 40 PVC blank riser
10.0									
		D&M		50	19			@ 10 feet: Paper, plastic, fiber, soil/decomposable (10% by volume).	2x12 Colorado silica sand pack
12.5									

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

(Continued Next Page)

SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

PROBE NUMBER GP-19

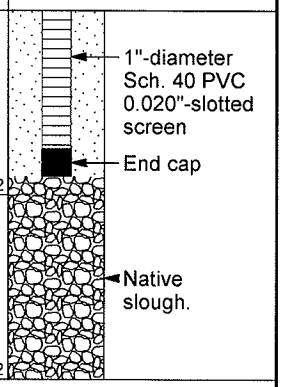
CLIENT City of Yakima **PROJECT NAME** Former City of Yakima Landfill

PROJECT NUMBER 001.0221.00006 **PROJECT LOCATION** Yakima, Washington

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
12.5								
		D&M		70	10	MSW		**MUNICIPAL SOLID WASTE**, medium dense, moist. *(continued)* @ 12.5 feet: Wood, plastic, glass, soil/decomposable (25% by volume).
								14.5 ▽ 1046.2
15.0								**SILTY SAND**, gray, fine-grained, little fines, very dense, wet.
		D&M		70	62	SM		
								16.5 1044.2

Boring completed at 16.5 feet.

PROBE DIAGRAM



SOIL VAPOR PROBE COMPLETION DETAILS:

+3 to 9.2 feet: 1"-diameter Sch. 40 PVC blank riser.
9.2 to 14 feet: 1"-diameter Sch. 40 PVC 0.020"-slotted screen.
14 to 14.3 feet: 1"-diameter Sch. 40 PVC end cap.

0 to 1.5 feet: Concrete.
1.5 to 7 feet: Hydrated bentonite chips.
7 to 14.3 feet: 2x12 Colorado silica sand.
14.3 to 16.5 feet: Native slough.

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

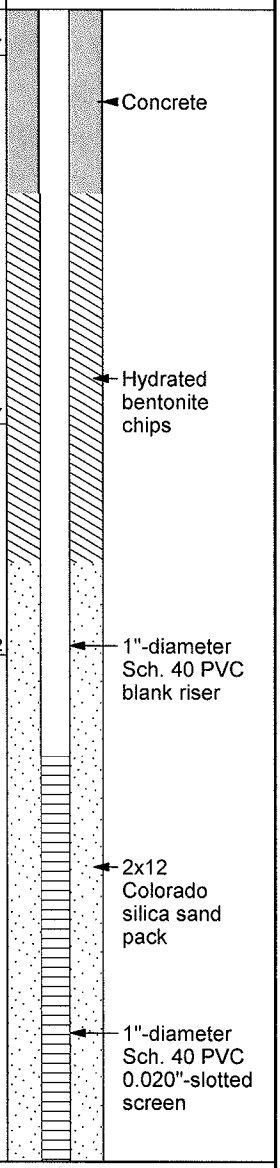
SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

PROBE NUMBER GP-20

CLIENT City of Yakima
PROJECT NAME Former City of Yakima Landfill
PROJECT NUMBER 001.0221.00006
PROJECT LOCATION Yakima, Washington
DATE STARTED 11/3/09 **COMPLETED** 11/3/09
GROUND ELEVATION 1057.16 ft **HOLE SIZE** 8.5" Diameter
DRILLING DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 14.0 ft / Elev 1043.2 ft
LOGGED BY C. Lee **CHECKED BY**
AT END OF ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0						WW		**WOOD WASTE**, sawdust, bark, ash, very moist.
								0.5 — 1056.7
								SANDY GRAVEL, reddish brown, medium- to coarse-grained, little fine- to coarse-grained sand, few fines, medium dense, very moist.
2.5						GP		
		D&M		30	24			
								4.5 — 1052.7
5.0								**SILTY SAND**, dark brown, fine-grained, little fines, medium dense, very moist to moist.
		D&M		50	12	SM		
								7.0 — 1050.2
7.5								**MUNICIPAL SOLID WASTE**, medium dense.
		D&M		50	23			@ 7.5 feet: Metal, wood, glass, paper, soil/decomposable (50% by volume), moist.
10.0						MSW		
		D&M		50	19			@ 10 feet: Wood, paper, plastic, fiber, soil/decomposable (20% by volume), moist.
12.5								

PROBE DIAGRAM



REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

(Continued Next Page)

SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

PROBE NUMBER GP-20

CLIENT City of Yakima **PROJECT NAME** Former City of Yakima Landfill

PROJECT NUMBER 001.0221.00006 **PROJECT LOCATION** Yakima, Washington

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PROBE DIAGRAM
12.5									
		D&M		30	24	MSW		**MUNICIPAL SOLID WASTE**, medium dense. *(continued)* @ 12.5 feet: Metal, wood, soil/decomposable (40% by volume), moist to wet. ▽ @ 14 feet: Becomes wet.	End cap
								14.5 1042.7	
15.0								**SANDY SILT**, dark gray, little fine-grained sand, hard, wet, trace roots.	Native material and municipal solid waste slough.
		D&M		30	47	ML			
								16.5 1040.7	

Boring completed at 16.5 feet.

SOIL VAPOR PROBE COMPLETION DETAILS:

+3.1 to 8.1 feet: 1"-diameter Sch. 40 PVC blank riser.
8.1 to 12.9 feet: 1"-diameter Sch. 40 PVC 0.020"-slotted screen.
12.9 to 13.2 feet: 1"-diameter Sch. 40 PVC end cap.

0 to 2 feet: Concrete.
2 to 6 feet: Hydrated bentonite chips.
6 to 13.5 feet: 2x12 Colorado silica sand.
13.5 to 16.5 feet: Native material and municipal solid waste slough.

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

PROBE NUMBER GP-21

CLIENT City of Yakima
PROJECT NAME Former City of Yakima Landfill
PROJECT NUMBER 001.0221.00006
PROJECT LOCATION Yakima, Washington
DATE STARTED 11/5/09 **COMPLETED** 11/5/09
GROUND ELEVATION 1063.38 ft **HOLE SIZE** 8.5" Diameter
DRILLING DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING --
LOGGED BY C. Lee **CHECKED BY**
AT END OF ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PROBE DIAGRAM
0.0									
						WW		**WOOD WASTE**, wood chips, sawdust, damp.	Concrete
2.5									
		D&M		100	37	SM		3.0 1060.4 **SILTY SAND**, dark gray, fine-grained, little fines, few fine gravel, dense, damp. 4.0 1059.4	
5.0								**MUNICIPAL SOLID WASTE**, medium dense, moist to damp.	Hydrated bentonite chips
		D&M		100	24			@ 5 feet: Brick, wood, metal, soil/decomposable (20% by volume).	
7.5									
		D&M		30	15	MSW		@ 7.5 feet: Plastic, metal, soil/decomposable (70% by volume).	1"-diameter Sch. 40 PVC blank riser
10.0									
		D&M		15	16			@ 10 feet: Ash, fiber, paper.	2x12 Colorado silica sand pack
12.5									

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

(Continued Next Page)

SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

PROBE NUMBER GP-21

CLIENT City of Yakima **PROJECT NAME** Former City of Yakima Landfill

PROJECT NUMBER 001.0221.00006 **PROJECT LOCATION** Yakima, Washington

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PROBE DIAGRAM
12.5									
		D&M		100	25	MSW		**MUNICIPAL SOLID WASTE**, medium dense, moist to damp. *(continued)* @ 12.5 feet: Wood, glass, metal, soil/decomposable (30% by volume). @ 13.5 feet: Some Ponderosa pine bark.	1"-diameter Sch. 40 PVC 0.020"-slotted screen
						SM		13.5 1049.9 **SILTY SAND**, gray, fine-grained, little fines, medium dense, moist.	End cap
15.0								14.5 1048.9 **GRAVELLY SAND**, gray, fine-grained, some fine to medium gravel, few fines, very dense, moist.	
		D&M		70	51	SP		16.5 1046.9	

Boring completed at 16.5 feet.

SOIL VAPOR PROBE COMPLETION DETAILS:

0 to 9.2 feet: 1"-diameter Sch. 40 PVC blank riser.
9.2 to 14 feet: 1"-diameter Sch. 40 PVC 0.020"-slotted screen.
14 to 14.3 feet: 1"-diameter Sch. 40 PVC end cap.

0 to 2 feet: Concrete.
2 to 7 feet: Hydrated bentonite chips.
7 to 16.5 feet: 2x12 Colorado silica sand.

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

PROBE NUMBER GP-22

CLIENT City of Yakima
PROJECT NAME Former City of Yakima Landfill
PROJECT NUMBER 001.0221.00006
PROJECT LOCATION Yakima, Washington
DATE STARTED 11/2/09 **COMPLETED** 11/2/09
GROUND ELEVATION 1063.30 ft **HOLE SIZE** 8.5" Diameter
DRILLING DRILLING CONTRACTOR Cascade Drilling
GROUND WATER LEVELS:
DRILLING DRILLING METHOD Hollow Stem Auger
▽ **AT TIME OF DRILLING** 13.0 ft / Elev 1050.3 ft
LOGGED BY C. Lee **CHECKED BY**
AT END OF ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0								**WOOD WASTE**, sawdust, trace fine gravel, damp to wet.
2.5	X	D&M		100	50/4"			
5.0	X	D&M		25	50/3"	WW		@ 6.5 feet: Bark chips and sawdust.
7.5	X	D&M		0	50/5"			@ 7.5 feet: No recovery.
10.0	X	D&M		100	21			
12.5								

PROBE DIAGRAM

- Concrete
- Hydrated bentonite chips
- 1"-diameter Sch. 40 PVC blank riser
- 2x12 Colorado silica sand pack
- 1"-diameter Sch. 40 PVC 0.020"-slotted screen

REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

(Continued Next Page)

SLR
SLR International Corp
22122 20th Avenue SE
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

PROBE NUMBER GP-22

CLIENT City of Yakima **PROJECT NAME** Former City of Yakima Landfill

PROJECT NUMBER 001.0221.00006 **PROJECT LOCATION** Yakima, Washington

DEPTH (ft)	INTERVAL	TYPE	NAME	RECOVERY %	BLOW COUNTS PER FOOT (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PROBE DIAGRAM
12.5									
		D&M		100	28	WW		**WOOD WASTE**, sawdust, trace fine gravel, damp to wet. *(continued)* @ 13 feet: Becomes wet.	End cap Native slough.
								14.0	1049.3

Boring completed at 14.0 feet.

SOIL VAPOR PROBE COMPLETION DETAILS:

+3.5 to 7.8 feet: 1"-diameter Sch. 40 PVC blank riser.
7.8 to 12.6 feet: 1"-diameter Sch. 40 PVC 0.020"-slotted screen.
12.6 to 12.9 feet: 1"-diameter Sch. 40 PVC end cap.

0 to 2 feet: Concrete.
2 to 6 feet: Hydrated bentonite chips.
6 to 13 feet: 2x12 Colorado silica sand.
13 to 14 feet: Native slough.

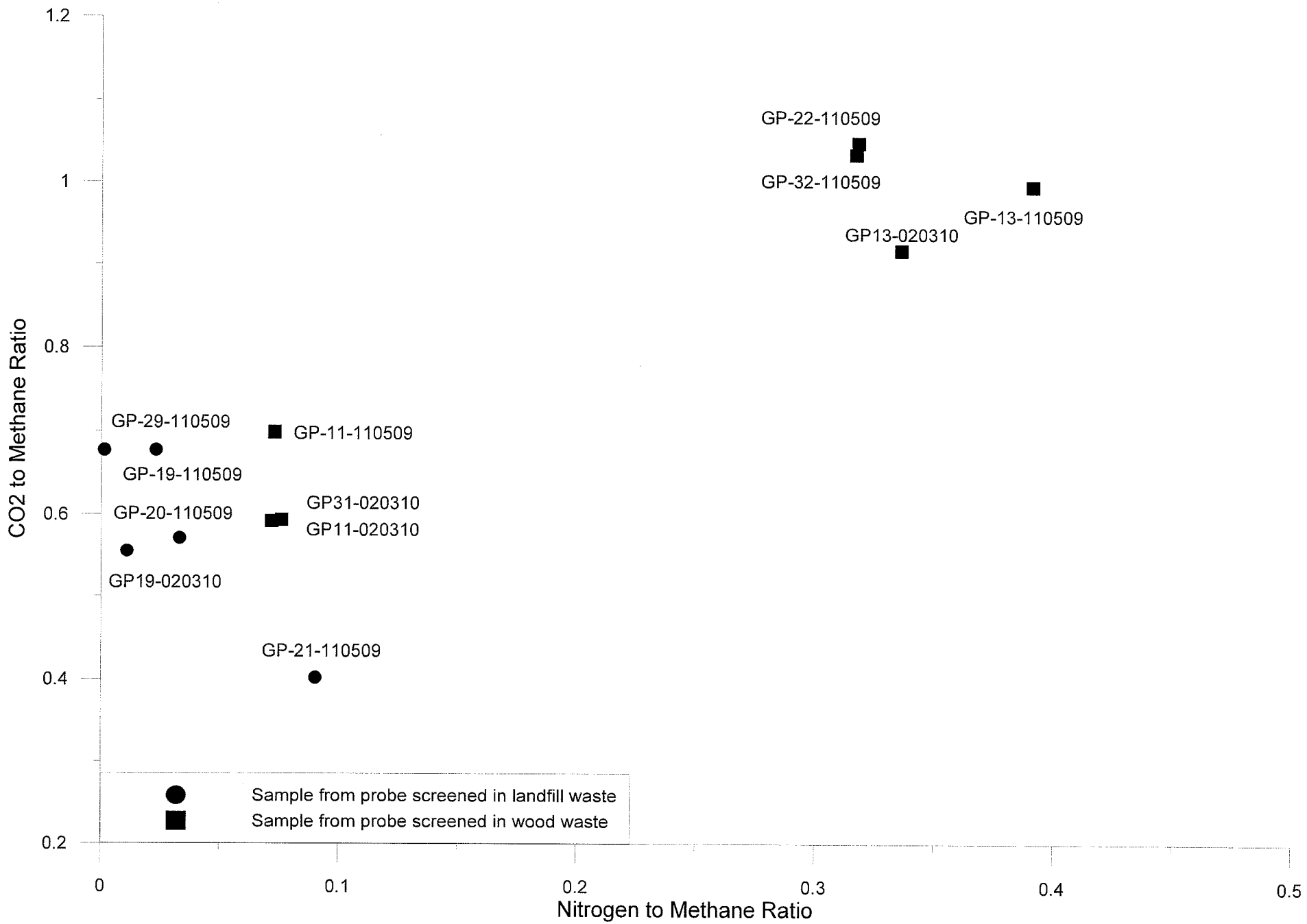
REMARKS

D&M = Samples collected by using an 18-inch-long, 3.0-inch outside diameter Dames & Moore split-barrel sampler driven by a 300 lb. wireline hammer.

▽ Water level at time of drilling.

APPENDIX B

PLOT OF NITROGEN TO METHANE RATIOS AND CO_2 TO METHANE RATIOS IN SOIL VAPOR SAMPLES


Former Yakima Landfill Site
Samples collected 11/5/2009 and 2/3/2010
CO2 to Methane Ratio
Nitrogen to Methane Ratio
1.2
1
0.8
0.6
0.4
0.2
0
0.1
0.2
0.3
0.4
0.5
GP-22-110509
GP-32-110509
GP-13-110509
GP13-020310
GP-29-110509
GP-11-110509
GP-19-110509
GP31-020310
GP11-020310
GP-20-110509
GP19-020310
GP-21-110509
Sample from probe screened in landfill waste
Sample from probe screened in wood waste

APPENDIX C

LABORATORY REPORTS

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 174607 Job #: 12209
Sample Name: GP-22-110509 Co. Lab#:
Company: SLR International Corp
Date Sampled: 11/05/2009
Container: Cali-5-Bond Bag
Field/Site Name: Former Yakima Landfill
Location: Yakima, WA
Formation/Depth:
Sampling Point:
Date Received: 11/09/2009 Date Reported: 12/07/2009

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	0.0100			
Argon	0.153			
Oxygen	0.0709			
Nitrogen	13.40			
Carbon Dioxide	44.20			
Methane	42.16	-58.00	-356.9	
Ethane	0.0006			
Ethylene	nd			
Propane	0.0003			
Iso-butane	0.0001			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0003			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 428
Specific gravity, calculated: 1.038

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 174608 Job #: 12209
Sample Name: GP-32-110509 Co. Lab#:
Company: SLR International Corp
Date Sampled: 11/05/2009
Container: Cali-5-Bond Bag
Field/Site Name: Former Yakima Landfill
Location: Yakima, WA
Formation/Depth:
Sampling Point:
Date Received: 11/09/2009 Date Reported: 12/07/2009

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	0.0109			
Argon	0.137			
Oxygen	0.108			
Nitrogen	13.44			
Carbon Dioxide	43.88			
Methane	42.42	-58.05	-360.8	
Ethane	0.0007			
Ethylene	nd			
Propane	0.0004			
Iso-butane	0.0002			
N-butane	0.0002			
Iso-pentane	0.0002			
N-pentane	0.0003			
Hexanes +	0.0002			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 430
Specific gravity, calculated: 1.035

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 174609 Job #: 12209
Sample Name: GP-13-110509 Co. Lab#:
Company: SLR International Corp
Date Sampled: 11/05/2009
Container: Cali-5-Bond Bag
Field/Site Name: Former Yakima Landfill
Location: Yakima, WA
Formation/Depth:
Sampling Point:
Date Received: 11/09/2009 Date Reported: 12/07/2009

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	0.0013			
Argon	0.172			
Oxygen	0.0718			
Nitrogen	16.34			
Carbon Dioxide	41.62			
Methane	41.79	-53.05	-353.0	
Ethane	0.0007			
Ethylene	nd			
Propane	0.0001			
Iso-butane	0.0001			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0003			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 424
Specific gravity, calculated: 1.025

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 174610 Job #: 12209
Sample Name: GP-11-110509 Co. Lab#:
Company: SLR International Corp
Date Sampled: 11/05/2009
Container: Cali-5-Bond Bag
Field/Site Name: Former Yakima Landfill
Location: Yakima, WA
Formation/Depth:
Sampling Point:
Date Received: 11/09/2009 Date Reported: 12/07/2009

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	nd			
Argon	0.0446			
Oxygen	0.226			
Nitrogen	4.10			
Carbon Dioxide	39.35			
Methane	56.28	-56.74	-353.8	
Ethane	0.0021			
Ethylene	0.0002			
Propane	0.0001			
Iso-butane	0.0002			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0005			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 571
Specific gravity, calculated: 0.952

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 174611 Job #: 12209
Sample Name: GP-20-110509 Co. Lab#:
Company: SLR International Corp
Date Sampled: 11/05/2009
Container: Cali-5-Bond Bag
Field/Site Name: Former Yakima Landfill
Location: Yakima, WA
Formation/Depth:
Sampling Point:
Date Received: 11/09/2009 Date Reported: 12/07/2009

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	nd			
Argon	0.0236			
Oxygen	0.366			
Nitrogen	2.05			
Carbon Dioxide	35.46			
Methane	62.10	-55.90	-348.9	
Ethane	0.0015			
Ethylene	0.0001			
Propane	0.0004			
Iso-butane	0.0005			
N-butane	0.0001			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0004			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 630
Specific gravity, calculated: 0.907

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 174612 Job #: 12209
Sample Name: GP-19-110509 Co. Lab#:
Company: SLR International Corp
Date Sampled: 11/05/2009
Container: Cali-5-Bond Bag
Field/Site Name: Former Yakima Landfill
Location: Yakima, WA
Formation/Depth:
Sampling Point:
Date Received: 11/09/2009 Date Reported: 12/07/2009

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	0.0229			
Argon	nd			
Oxygen	0.0279			
Nitrogen	0.072			
Carbon Dioxide	40.33			
Methane	59.54	-56.15	-353.4	
Ethane	0.0017			
Ethylene	0.0003			
Propane	0.0004			
Iso-butane	0.0005			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0013			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 604
Specific gravity, calculated: 0.944

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 174613 Job #: 12209
Sample Name: GP-29-110509 Co. Lab#:
Company: SLR International Corp
Date Sampled: 11/05/2009
Container: Cali-5-Bond Bag
Field/Site Name: Former Yakima Landfill
Location: Yakima, WA
Formation/Depth:
Sampling Point:
Date Received: 11/09/2009 Date Reported: 12/07/2009

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	0.0223			
Argon	nd			
Oxygen	0.0785			
Nitrogen	1.35			
Carbon Dioxide	39.80			
Methane	58.74	-56.05	-352.7	
Ethane	0.0017			
Ethylene	0.0003			
Propane	0.0004			
Iso-butane	0.0006			
N-butane	0.0002			
Iso-pentane	0.0002			
N-pentane	0.0003			
Hexanes +	0.0017			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 596
Specific gravity, calculated: 0.944

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 174614 Job #: 12209
Sample Name: GP-21-110509 Co. Lab#:
Company: SLR International Corp
Date Sampled: 11/05/2009
Container: Cali-5-Bond Bag
Field/Site Name: Former Yakima Landfill
Location: Yakima, WA
Formation/Depth:
Sampling Point:
Date Received: 11/09/2009 Date Reported: 12/07/2009

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	0.0080			
Argon	0.0621			
Oxygen	0.112			
Nitrogen	6.03			
Carbon Dioxide	26.90			
Methane	66.88	-61.38	-346.7	
Ethane	0.0036			
Ethylene	0.0003			
Propane	0.0003			
Iso-butane	0.0003			
N-butane	0.0001			
Iso-pentane	nd			
N-pentane	0.0001			
Hexanes +	0.0013			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 679
Specific gravity, calculated: 0.840

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

Isotech Gas Data

Job 12209
Former Yakima Landfill
Yakima, WA

Isotech Lab No.	Sample Name	GC date	He %	H_2 %	Ar %	O_2 %	CO_2 %	N_2 %	CO %	C_1 %	C_2 %	C_3 %	iC_4 %	nC_4 %	iC_5 %	nC_5 %	C_6+ %	MS date	$\delta^{13}C_1$ ‰	δDC_1 ‰	Specific Gravity	BTU
174607	GP-22-110509	11/9/2009	0	0.0100	0.153	0.0709	44.20	13.40	0	42.16	0.0006	0.0003	0.0001	0	0	0	0.0003	12/3/2009	-58.00	-356.9	1.038	428
174608	GP-32-110509	11/11/2009	0	0.0109	0.137	0.108	43.88	13.44	0	42.42	0.0007	0.0004	0.0002	0.0002	0.0002	0.0003	0.0002	12/3/2009	-58.05	-360.8	1.035	430
174609	GP-13-110509	11/30/2009	0	0.0013	0.172	0.0718	41.62	16.34	0	41.79	0.0007	0.0001	0.0001	0	0	0	0.0003	12/3/2009	-53.05	-353.0	1.025	424
174610	GP-11-110509	11/30/2009	0	0	0.0446	0.226	39.35	4.10	0	56.28	0.0021	0.0001	0.0002	0	0	0	0.0005	12/3/2009	-56.74	-353.8	0.952	571
174611	GP-20-110509	12/1/2009	0	0	0.0236	0.366	35.46	2.05	0	62.10	0.0015	0.0004	0.0005	0.0001	0	0	0.0004	12/3/2009	-55.90	-348.9	0.907	630
174612	GP-19-110509	12/1/2009	0	0.0229	0	0.0279	40.33	0.072	0	59.54	0.0017	0.0004	0.0005	0	0	0	0.0013	12/3/2009	-56.15	-353.4	0.944	604
174613	GP-29-110509	12/2/2009	0	0.0223	0	0.0785	39.80	1.35	0	58.74	0.0017	0.0004	0.0006	0.0002	0.0002	0.0003	0.0017	12/3/2009	-56.05	-352.7	0.944	596
174614	GP-21-110509	12/2/2009	0	0.0080	0.0621	0.112	26.90	6.03	0	66.88	0.0036	0.0003	0.0003	0.0001	0	0.0001	0.0013	12/3/2009	-61.38	-346.7	0.84	679

Chemical analysis based on standards accurate to within 2%

Send Data and Invoice to

Name: Mike Staton
Company: SLR International Corp
Address: 22122 20th Ave. SE, H-150
Bothell, WA 98021
Phone: (425) 402-8800
Fax: (425) 402-8488
Email: mstaton@slrcorp.com

Project: Former Yakima Landfill
Location: Yakima, WA
Sampled by: Chris Lee

Circle one:
Standard
Priority
Rush

Analysis Package Codes on Back

ISOTECH
Isotech Laboratories Inc
1308 Parkland Court
Champaign, IL 61821
Phone 217-398-3490
Fax 217-398-3493
www.isotechlabs.com
mail@isotechlabs.com

Sample Description

Container Number	Sample Identification	Date Sampled	Time	Analyses Requested			Comments
N/A	GP-22-110509	11/5/2009	12:10	*			Hold for possible follow-up analysis
N/A	GP-32-110509		12:25	*			
N/A	GP-13-110509		12:35	*			
N/A	GP-11-110509		12:50	*			
N/A	GP-20-110509		13:05	*			
N/A	GP-19-110509		13:15	*			
N/A	GP-29-110509		13:25	*			
N/A	GP-21-110509		13:40	*			

* Please analyze according to discussions via email.

Chain-of-Custody Record

Signature	Company	Date	Time
Relinquished by Chris Lee	SLR	11/5/09	1345
Received by			
Relinquished by			
Received by			
Relinquished by			
Received by			

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 16, 2009

Mike Staton, Project Manager
SLR International Corp.
22122 20th Ave. SE., H-150
Bothell, WA 98021

Dear Mr. Staton:

Included are the amended results from the testing of material submitted on November 5, 2009 from the 001.0221.00006 Yakima Landfill, F&BI 911035 project. Per your request, the arsenic results were lowered to the method detection limit.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SLR1120R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
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Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

November 20, 2009

Mike Staton, Project Manager
SLR International Corp.
22122 20th Ave. SE., H-150
Bothell, WA 98021

Dear Mr. Staton:

Included are the results from the testing of material submitted on November 5, 2009 from the 001.0221.00006 Yakima Landfill, F&BI 911035 project. There are 28 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SLR1120R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 5, 2009 by Friedman & Bruya, Inc. from the SLR International Corp. 001.0221.00006 Yakima Landfill, F&BI 911035 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	SLR International Corp.
911035-01	MW-7-1109
911035-02	MW-8-1109
911035-03	MW-13-1109
911035-04	MW-9A-1109
911035-05	MW-12-1109
911035-06	MW-11-1109
911035-07	Trip Blank

The samples were sent to Aquatic Research for nitrate, chloride, sulfate, alkalinity, Ca, Na, Fe, and Mg analyses. Review of the enclosed report indicates that all quality assurance was acceptable.

All quality control requirements were acceptable.

Date of Report: 11/20/09
Date Received: 11/05/09
Project: 001.0221.00006 Yakima Landfill, F&BI 911035
Date Extracted: NA
Date Analyzed: 11/05/09

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH USING EPA METHOD 9040C

Sample ID Laboratory ID	pH
MW-7-1109 911035-01	6.45
MW-8-1109 911035-02	6.34
MW-13-1109 911035-03	6.85
MW-9A-1109 911035-04	6.72
MW-12-1109 911035-05	6.53
MW-11-1109 911035-06	6.47

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-7-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-01
Date Analyzed:	11/11/09	Data File:	911035-01.058
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	109	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	3.06

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-7-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-01 10x
Date Analyzed:	11/16/09	Data File:	911035-01 10x.036
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	97	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	2,330

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-8-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-02
Date Analyzed:	11/11/09	Data File:	911035-02.059
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	104	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.98 j

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-8-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-02 10x
Date Analyzed:	11/16/09	Data File:	911035-02 10x.037
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	2,690

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-13-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-03
Date Analyzed:	11/11/09	Data File:	911035-03.060
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	100	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.36 j

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-13-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-03 10x
Date Analyzed:	11/16/09	Data File:	911035-03 10x.038
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	287

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-9A-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-04
Date Analyzed:	11/11/09	Data File:	911035-04.061
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	109	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.93 j

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-9A-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-04 10x
Date Analyzed:	11/16/09	Data File:	911035-04 10x.039
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	100	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	13.3

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-12-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-05
Date Analyzed:	11/11/09	Data File:	911035-05.062
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	106	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	2.01

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-12-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-05 10x
Date Analyzed:	11/16/09	Data File:	911035-05 10x.040
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	745

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-11-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-06
Date Analyzed:	11/11/09	Data File:	911035-06.063
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	110	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	4.80

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-11-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911035-06 10x
Date Analyzed:	11/16/09	Data File:	911035-06 10x.043
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	1,890

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	I9-481 mb
Date Analyzed:	11/11/09	Data File:	I9-481 mb.047
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	106	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.15 j

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	I9-481 mb
Date Analyzed:	11/16/09	Data File:	I9-481 mb.031
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	83	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-7-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/05/09	Lab ID:	911035-01
Date Analyzed:	11/05/09	Data File:	110509.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	65	127
Toluene-d8	100	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-8-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/05/09	Lab ID:	911035-02
Date Analyzed:	11/05/09	Data File:	110511.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	65	127
Toluene-d8	100	69	127
4-Bromofluorobenzene	98	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-13-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/05/09	Lab ID:	911035-03
Date Analyzed:	11/05/09	Data File:	110512.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	108	65	127
Toluene-d8	103	69	127
4-Bromofluorobenzene	102	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-9A-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/05/09	Lab ID:	911035-04
Date Analyzed:	11/05/09	Data File:	110513.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	65	127
Toluene-d8	100	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-12-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/05/09	Lab ID:	911035-05
Date Analyzed:	11/05/09	Data File:	110514.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	65	127
Toluene-d8	101	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-11-1109	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/05/09	Lab ID:	911035-06
Date Analyzed:	11/05/09	Data File:	110515.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	65	127
Toluene-d8	101	69	127
4-Bromofluorobenzene	98	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Trip Blank	Client:	SLR International Corp.
Date Received:	11/05/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/05/09	Lab ID:	911035-07
Date Analyzed:	11/05/09	Data File:	110508.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	65	127
Toluene-d8	101	69	127
4-Bromofluorobenzene	97	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/05/09	Lab ID:	091560 mb
Date Analyzed:	11/05/09	Data File:	110507.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	65	127
Toluene-d8	103	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Date of Report: 11/20/09
Date Received: 11/05/09
Project: 001.0221.00006 Yakima Landfill, F&BI 911035

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH BY METHOD 9040C

Laboratory Code: 911035-02 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
pH	6.34	6.33	0	0-20

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 911050-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	ug/L (ppb)	<1	<1	nm	0-20
Manganese	ug/L (ppb)	6.96	7.27	4	0-20

Laboratory Code: 911050-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	<1	99	50-150
Manganese	ug/L (ppb)	20	6.96	97	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	92	70-130
Manganese	ug/L (ppb)	20	102	70-130

Date of Report: 11/20/09
Date Received: 11/05/09
Project: 001.0221.00006 Yakima Landfill, F&BI 911035

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 911035-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Vinyl chloride	ug/L (ppb)	<0.2	<0.2	nm

Laboratory Code: 911035-06 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	125	35-159

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	109	118	53-131	8

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI005-33**		**PAGE 1**
REPORT DATE:	**11/19/09**		
DATE SAMPLED:	**11/04/09**	**DATE RECEIVED:**	**11/05/09**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 911035

CASE NARRATIVE

Six water samples were received by the laboratory in good condition and analyzed according to the chain of custody. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

SAMPLE ID	ALKALINITY (mgCaCO3/l)	SULFATE (mg/L)	CHLORIDE (mg/L)	NITRATE (mg/L)
MW-7-1109	241	9.12	21.9	0.199
MW-8-1109	174	58.0	108	17.9
MW-13-1109	72.4	1.89	6.26	0.026
MW-9A-1109	97.5	10.7	10.9	3.13
MW-12-1109	84.0	<1.00	6.96	0.016
MW-11-1109	202	<1.00	13.5	0.027

SAMPLE ID	CALCIUM (mg/L)	SODIUM (mg/L)	IRON (mg/L)	MAGNESIUM (mg/L)
MW-7-1109	49.1	22.9	18.5	18.2
MW-8-1109	51.4	48.3	0.045	27.6
MW-13-1109	19.1	7.76	1.55	1.83
MW-9A-1109	23.8	11.1	<0.020	8.02
MW-12-1109	14.2	13.3	5.84	4.32
MW-11-1109	44.8	17.3	35.4	14.5

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI005-33**		**PAGE 2**
REPORT DATE:	**11/19/09**		
DATE SAMPLED:	**11/04/09**	**DATE RECEIVED:**	**11/05/09**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 911035

QA/QC DATA

QC PARAMETER	ALKALINITY (mgCaCO3/l)	SULFATE (mg/L)	CHLORIDE (mg/L)	NITRATE (mg/L)
METHOD	SM18 2320B	SM184500SO4E	SM18 4500CL-C	SM184500N03F
DATE ANALYZED	11/17/09	11/10/09	11/18/09	11/06/09
DETECTION LIMIT	1.00	1.00	0.50	0.010
DUPLICATE				
SAMPLE ID	BATCH	BATCH	BATCH	MW-11-1109
ORIGINAL	117	12.1	35.4	0.027
DUPLICATE	118	12.2	36.0	0.027
RPD	0.85%	0.63%	1.64%	2.62%
SPIKE SAMPLE				
SAMPLE ID		BATCH	BATCH	MW-11-1109
ORIGINAL		12.1	35.4	0.027
SPIKED SAMPLE		22.1	45.6	0.218
SPIKE ADDED		10.0	10.0	0.200
% RECOVERY	NA	99.82%	101.66%	95.84%
QC CHECK				
FOUND	98.4	9.86	29.5	0.417
TRUE	100	10.0	30.0	0.408
% RECOVERY	98.40%	98.55%	98.40%	102.23%
BLANK	NA	<1.00	<0.50	<0.010

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI005-33**		**PAGE 3**
REPORT DATE:	**11/19/09**		
DATE SAMPLED:	**11/04/09**	**DATE RECEIVED:**	**11/05/09**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 911035

QA/QC DATA

QC PARAMETER	CALCIUM (mg/L)	SODIUM (mg/L)	IRON (mg/L)	MAGNESIUM (mg/L)
METHOD	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
DATE ANALYZED	11/11/09	11/11/09	11/11/09	11/11/09
DETECTION LIMIT	0.100	0.500	0.020	0.100
DUPLICATE				
SAMPLE ID	BATCH	BATCH	BATCH	BATCH
ORIGINAL	0.968	0.598	0.073	<0.100
DUPLICATE	0.953	0.588	0.070	<0.100
RPD	1.53%	1.64%	4.60%	NC
SPIKE SAMPLE				
SAMPLE ID	BATCH	BATCH	BATCH	BATCH
ORIGINAL	0.968	0.598	0.073	<0.100
SPIKED SAMPLE	12.9	11.6	10.3	10.2
SPIKE ADDED	10.0	10.0	10.0	10.0
% RECOVERY	119.42%	110.50%	102.49%	102.01%
QC CHECK				
FOUND	9.95	9.26	1.02	9.51
TRUE	10.0	10.0	1.00	10.0
% RECOVERY	99.54%	92.58%	101.90%	95.12%
BLANK	<0.100	<0.500	<0.020	<0.100

RPD = RELATIVE PERCENT DIFFERENCE
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Steven Lazoff
Laboratory Director

911035

SAMPLE CHAIN OF CUSTODY

ME 11-5-09 V3/AI3

Page # 1 of 1

Send Report To

Company SLR - Mike Staton

Address MStaton@slrcorp.com

City, State, ZIP

Phone # (425) 402-6800 Fax #

SAMPLERS (signature) Chris Kramer

PROJECT NAME/NO. 001.0221.00006 Yakima Landfill

PO #

REMARKS Dis. Metals filtered in field

As, Ca, Na, Fe, Mg, Mn

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Dis. Metals	nitrate chlorite	PH, Alkalinity	Sulfide			Notes
MW-7-1109	01 A-E	11/4/09	650	GW	5				X			X	X	X	/			V-perchem 11/4/09 ms.
MW-8-1109	02 A-E	"	935	"	"				X			X	X	X	/			
MW-13-1109	03 A-E	"	1004	"	"				X			X	X	X	/			
MW-9A-1109	04 A-E	"	1100	"	"				X			X	X	X	/			
MW-12-1109	05 A-E	"	1150	"	"				X			X	X	X	/			
MW-11-1109	06 A-E	"	1227	"	"				X			X	X	X	/			
Trip Blank	07	-	-	W	1													(NP) 11-5-09 Added in Lab

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Chris Kramer	Chris Kramer	SLR	11/4/09	1400
Received by: Nhan Phan	Nhan Phan	FEBI	11/5/09	8:55
Relinquished by:				
Received by:		Samples received at 0 °C		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 16, 2009

Mike Staton, Project Manager
SLR International Corp.
22122 20th Ave. SE., H-150
Bothell, WA 98021

Dear Mr. Staton:

Included are the amended results from the testing of material submitted on November 6, 2009 from the 001.0221.00006, F&BI 911051 project. Per your request, the arsenic results were lowered to the method detection limit.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SLR1120R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
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Bradley T. Benson, B.S.
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3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

November 20, 2009

Mike Staton, Project Manager
SLR International Corp.
22122 20th Ave. SE., H-150
Bothell, WA 98021

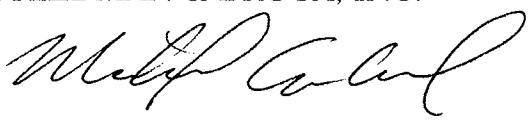
Dear Mr. Staton:

Included are the results from the testing of material submitted on November 6, 2009 from the 001.0221.00006, F&BI 911051 project. There are 24 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
SLR1120R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 6, 2009 by Friedman & Bruya, Inc. from the SLR International Corp. 001.0221.00006, F&BI 911051 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	SLR International Corp.
911051-01	MW-18-1109
911051-02	MW-17-1109
911051-03	MW-16-1109
911051-04	MW-15-1109
911051-05	MW-14-1109

The samples were sent to Aquatic Research for nitrate, chloride, sulfate, alkalinity, Ca, Na, Fe, and Mg analyses. Review of the enclosed report indicates that all quality assurance was acceptable.

All quality control requirements were acceptable.

Date of Report: 11/20/09
Date Received: 11/06/09
Project: 001.0221.00006, F&BI 911051
Date Extracted: NA
Date Analyzed: 11/06/09

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH USING EPA METHOD 9040C

Sample ID Laboratory ID	pH
MW-18-1109 911051-01	6.36
MW-17-1109 911051-02	6.50
MW-16-1109 911051-03	6.76
MW-15-1109 911051-04	6.61
MW-14-1109 911051-05	6.90

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-18-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-01
Date Analyzed:	11/11/09	Data File:	911051-01.052
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	107	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	6.75

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-18-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-01 10x
Date Analyzed:	11/16/09	Data File:	911051-01 10x.044
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	4,450

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-17-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-02
Date Analyzed:	11/11/09	Data File:	911051-02.053
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	106	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	2.15

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-17-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-02 10x
Date Analyzed:	11/16/09	Data File:	911051-02 10x.045
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	2,150

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-16-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-03
Date Analyzed:	11/11/09	Data File:	911051-03.055
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	101	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.77 j

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-16-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-03 10x
Date Analyzed:	11/16/09	Data File:	911051-03 10x.046
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	587

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-15-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-04
Date Analyzed:	11/11/09	Data File:	911051-04.056
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	107	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	1.39

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-15-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-04 10x
Date Analyzed:	11/16/09	Data File:	911051-04 10x.047
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	993

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-14-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-05
Date Analyzed:	11/11/09	Data File:	911051-05.057
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	102	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.61 j

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-14-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	911051-05 10x
Date Analyzed:	11/16/09	Data File:	911051-05 10x.048
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	331

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	I9-481 mb
Date Analyzed:	11/11/09	Data File:	I9-481 mb.047
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	106	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.15 j

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/10/09	Lab ID:	I9-481 mb
Date Analyzed:	11/16/09	Data File:	I9-481 mb.031
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	BTB, AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	83	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-18-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/06/09	Lab ID:	911051-01
Date Analyzed:	11/06/09	Data File:	110556.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	65	127
Toluene-d8	100	69	127
4-Bromofluorobenzene	101	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-17-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/06/09	Lab ID:	911051-02
Date Analyzed:	11/06/09	Data File:	110558.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	65	127
Toluene-d8	100	69	127
4-Bromofluorobenzene	97	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-16-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/06/09	Lab ID:	911051-03
Date Analyzed:	11/06/09	Data File:	110559.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	65	127
Toluene-d8	99	69	127
4-Bromofluorobenzene	97	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-15-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/06/09	Lab ID:	911051-04
Date Analyzed:	11/06/09	Data File:	110560.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	65	127
Toluene-d8	102	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-14-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/06/09	Lab ID:	911051-05
Date Analyzed:	11/06/09	Data File:	110561.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	65	127
Toluene-d8	101	69	127
4-Bromofluorobenzene	98	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006, F&BI 911051
Date Extracted:	11/06/09	Lab ID:	091562 mb
Date Analyzed:	11/06/09	Data File:	110547.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	65	127
Toluene-d8	102	69	127
4-Bromofluorobenzene	104	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Date of Report: 11/20/09
Date Received: 11/06/09
Project: 001.0221.00006, F&BI 911051

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH BY METHOD 9040C

Laboratory Code: 911035-02 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
pH	6.34	6.33	0	0-20

Date of Report: 11/20/09
Date Received: 11/06/09
Project: 001.0221.00006, F&BI 911051

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 911050-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	ug/L (ppb)	<1	<1	nm	0-20
Manganese	ug/L (ppb)	6.96	7.27	4	0-20

Laboratory Code: 911050-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	<1	99	50-150
Manganese	ug/L (ppb)	20	6.96	97	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	92	70-130
Manganese	ug/L (ppb)	20	102	70-130

Date of Report: 11/20/09
Date Received: 11/06/09
Project: 001.0221.00006, F&BI 911051

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 911051-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Vinyl chloride	ug/L (ppb)	<0.2	<0.2	nm

Laboratory Code: 911036-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	<0.2	120	35-159

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	129	131	53-131	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI005-35**		**PAGE 1**
REPORT DATE:	**11/19/09**		
DATE SAMPLED:	**11/05/09**	**DATE RECEIVED:**	**11/06/09**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 911051

CASE NARRATIVE

Five water samples were received by the laboratory in good condition and analyzed according to the chain of custody. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

SAMPLE ID	ALKALINITY (mgCaCO3/l)	SULFATE (mg/L)	CHLORIDE (mg/L)	NITRATE (mg/L)
MW-18-1109	345	1.69	37.0	0.035
MW-17-1109	236	<1.00	18.0	0.027
MW-16-1109	190	110	28.5	0.306
MW-15-1109	123	<1.00	8.27	0.013
MW-14-1109	117	12.1	35.4	0.265

	DISSOLVED METALS			
SAMPLE ID	CALCIUM (mg/L)	SODIUM (mg/L)	IRON (mg/L)	MAGNESIUM (mg/L)
MW-18-1109	49.7	38.4	26.1	24.4
MW-17-1109	35.4	23.4	16.8	13.8
MW-16-1109	49.4	36.8	<0.020	18.6
MW-15-1109	18.1	9.60	7.97	8.32
MW-14-1109	17.3	27.8	0.063	8.29

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI005-35**		**PAGE 2**
REPORT DATE:	**11/19/09**		
DATE SAMPLED:	**11/05/09**	**DATE RECEIVED:**	**11/06/09**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 911051

QA/QC DATA

QC PARAMETER	ALKALINITY (mgCaCO3/l)	SULFATE (mg/L)	CHLORIDE (mg/L)	NITRATE (mg/L)
METHOD	SM18 2320B	SM184500SO4E	SM18 4500CL-C	SM184500N03F
DATE ANALYZED	11/17/09	11/10/09	11/18/09	11/06/09
DETECTION LIMIT	1.00	1.00	0.50	0.010
DUPLICATE				
SAMPLE ID	MW-14-1109	MW-14-1109	MW-14-1109	BATCH
ORIGINAL	117	12.1	35.4	0.027
DUPLICATE	118	12.2	36.0	0.027
RPD	0.85%	0.63%	1.64%	2.62%
SPIKE SAMPLE				
SAMPLE ID		MW-14-1109	MW-14-1109	BATCH
ORIGINAL		12.1	35.4	0.027
SPIKED SAMPLE		22.1	45.6	0.218
SPIKE ADDED		10.0	10.0	0.200
% RECOVERY	NA	99.82%	101.66%	95.84%
QC CHECK				
FOUND	98.4	9.86	29.5	0.417
TRUE	100	10.0	30.0	0.408
% RECOVERY	98.40%	98.55%	98.40%	102.23%
BLANK	NA	<1.00	<0.50	<0.010

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: FBI005-35

REPORT DATE: 11/19/09

DATE SAMPLED: 11/05/09 **DATE RECEIVED:** 11/06/09

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 911051

QA/QC DATA

	DISSOLVED METALS			
QC PARAMETER	CALCIUM (mg/L)	SODIUM (mg/L)	IRON (mg/L)	MAGNESIUM (mg/L)
METHOD	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
DATE ANALYZED	11/09/09	11/09/09	11/09/09	11/09/09
DETECTION LIMIT	0.100	0.500	0.020	0.100
DUPLICATE				
SAMPLE ID	MW-14-1109	MW-14-1109	MW-14-1109	MW-14-1109
ORIGINAL	17.3	27.8	0.063	8.29
DUPLICATE	17.5	27.8	0.060	8.42
RPD	1.24%	0.28%	6.01%	1.60%
SPIKE SAMPLE				
SAMPLE ID	MW-14-1109	MW-14-1109	MW-14-1109	MW-14-1109
ORIGINAL	17.3	27.8	0.063	8.29
SPIKED SAMPLE	28.6	36.8	10.8	17.6
SPIKE ADDED	10.0	10.0	10.0	10.0
% RECOVERY	112.87%	90.02%	107.24%	93.35%
QC CHECK				
FOUND	9.10	9.22	1.05	9.78
TRUE	10.0	10.0	1.00	10.0
% RECOVERY	90.97%	92.18%	104.74%	97.82%
BLANK	<0.100	<0.500	<0.020	<0.100

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Steven Lazoff
Laboratory Director

911051

SAMPLE CHAIN OF CUSTODY

ME 11-6-09

Page # 1 of 1 V2/AI2

Send Report To

Company SLR - Mike Staton

Address MStaton@SLRcorp.com

City, State, ZIP

Phone # (425) 402-8800 Fax #

SAMPLERS (signature) [signature]

PROJECT NAME/NO. 001.0221.00006 Yakima Landfill

PO #

REMARKS
* Dis. metals: Calcium, Iron, Magnesium, sodium Manganese, sodium, arsenic
~~* Dis. metals ..., sodium, iron, manganese~~

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260 (VC only)	SVOCs by 8270	HFS	* Dis. metals (200.8)	chloride sulfate Nitrate (300.0)	pH Alkalinity (150.1) (310.1)	~~Dis metals 7~~	~~Nitrate pH~~		Notes
MW-18-1109	01 A-E	11/5/09	740	GW	5				X			X	X	X				
MW-17-1109	02 A-E	↓	845	↓	↓				X			X	X	X				
MW-16-1109	03 A-E	↓	925	↓	↓				X			X	X	X				
MW-15-1109	04 A-E	↓	1040	↓	↓				X			X	X	X				
MW-14-1109	05 A-E	↓	1117	↓	↓				X			X	X	X				
~~[illegible]-1109~~																		No sample

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Chris Kramer	SLR	11/5/09	1400
Received by: [signature]	Nhan Phan	FeBI	11/6/09	0900
Relinquished by:				
Received by:		Samples received at	0 °C	

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 16, 2009

Mike Staton, Project Manager
SLR International Corp.
22122 20th Ave. SE., H-150
Bothell, WA 98021

Dear Mr. Staton:

Included are the amended results from the testing of material submitted on November 6, 2009 from the 001.0221.00006 Yakima Landfill, F&BI 911050 project. Per your request, the arsenic results were lowered to the method detection limit.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SLR1120R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

November 20, 2009

Mike Staton, Project Manager
SLR International Corp.
22122 20th Ave. SE., H-150
Bothell, WA 98021

Dear Mr. Staton:

Included are the results from the testing of material submitted on November 6, 2009 from the 001.0221.00006 Yakima Landfill, F&BI 911050 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SLR1120R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 6, 2009 by Friedman & Bruya, Inc. from the SLR International Corp. 001.0221.00006 Yakima Landfill, F&BI 911050 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	SLR International Corp.
911050-01	River-1109

Sample River-1109 was sent to Aquatic Research for nitrate, sodium, and iron analyses. The report is enclosed.

All quality control requirements were acceptable.

Date of Report: 11/20/09
Date Received: 11/06/09
Project: 001.0221.00006 Yakima Landfill, F&BI 911050
Date Extracted: NA
Date Analyzed: 11/06/09

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH USING EPA METHOD 9040C

Sample ID Laboratory ID	pH
River-1109 911050-01	6.80

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	River-1109	Client:	SLR International Corp.
Date Received:	11/06/09	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	911050-01
Date Analyzed:	11/16/09	Data File:	911050-01.033
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	92	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	6.96
Arsenic	0.52 j

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006 Yakima Landfill
Date Extracted:	11/10/09	Lab ID:	I9-481 mb
Date Analyzed:	11/16/09	Data File:	I9-481 mb.031
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	83	60	125
Indium	85	60	125

Analyte:	Concentration ug/L (ppb)
Manganese	<1
Arsenic	<0.15 j

Date of Report: 11/20/09
Date Received: 11/06/09
Project: 001.0221.00006 Yakima Landfill, F&BI 911050

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH BY METHOD 9040C

Laboratory Code: 911035-02 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
pH	6.34	6.33	0	0-20

Date of Report: 11/20/09
Date Received: 11/06/09
Project: 001.0221.00006 Yakima Landfill, F&BI 911050

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 911050-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	ug/L (ppb)	<1	<1	nm	0-20
Manganese	ug/L (ppb)	6.96	7.27	4	0-20

Laboratory Code: 911050-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	<1	99	50-150
Manganese	ug/L (ppb)	20	6.96	97	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	92	70-130
Manganese	ug/L (ppb)	20	102	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI005-34**	**PAGE 1**	
REPORT DATE:	**11/16/09**		
DATE SAMPLED:	**11/05/09**	**DATE RECEIVED:**	**11/06/09**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 911050

CASE NARRATIVE

One water sample was received by the laboratory in good condition and analyzed according to the chain of custody. No difficulties were encountered in the preparation or analysis of this sample. Sample data follows while QA/QC data is contained on the subsequent pages.

SAMPLE DATA

	DISSOLVED METALS		
SAMPLE ID	SODIUM (mg/L)	IRON (mg/L)	NITRATE (mg/L)
RIVER-1109	5.02	<0.020	0.171

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI005-34**	**PAGE 3**	
REPORT DATE:	**11/16/09**		
DATE SAMPLED:	**11/05/09**	**DATE RECEIVED:**	**11/06/09**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 911050

QA/QC DATA

	DISSOLVED METALS		
QC PARAMETER	SODIUM (mg/L)	IRON (mg/L)	NITRATE (mg/L)
METHOD	EPA 200.7	EPA 200.7	SM184500N03F
DATE ANALYZED	11/09/09	11/09/09	11/06/09
DETECTION LIMIT	0.500	0.020	0.010
DUPLICATE			
SAMPLE ID	BATCH	BATCH	BATCH
ORIGINAL	27.8	0.063	0.274
DUPLICATE	27.8	0.060	0.278
RPD	0.28%	6.01%	1.51%
SPIKE SAMPLE			
SAMPLE ID	BATCH	BATCH	BATCH
ORIGINAL	27.8	0.063	0.274
SPIKED SAMPLE	36.8	10.8	0.464
SPIKE ADDED	10.0	10.0	0.200
% RECOVERY	90.02%	107.24%	94.75%
QC CHECK			
FOUND	9.22	1.05	0.402
TRUE	10.0	1.00	0.408
% RECOVERY	92.18%	104.74%	98.55%
BLANK	<0.500	<0.020	<0.010

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Steven Lazoff
Laboratory Director

ISOTECH®
ISOTECH LABORATORIES INC
www.isotechlabs.com

1308 Parkland Court Champaign, IL 61821-1826 | 877.362.4190 217.398.3490 217.398.3493 Fax

February 12, 2010

Michael Staton
SLR International Corp
22122 20th Avenue SE
Building H, Suite 150
Bothell WA 89021

Dear Michael,

Enclosed are the hard copy analysis reports for the samples submitted from the former Yakima Landfill site. These samples were assigned to Isotech job number 12512. These are the same data that were emailed to you earlier. I have also enclosed an updated figure illustrating certain characteristics of these gases, along with the gases from this site collected in November 2009

We will hold the samples until 3/5/10 in case you would want any additional analyses carried out, and will then dispose of the remaining sample material. If you need us to hold the samples longer, please contact us.

If you have any questions or if there is anything else we can do for you, please do not hesitate to contact us. Thank you for choosing Isotech for your analysis needs, we appreciate your business.

Sincerely,

Steven R. Pelphrey
Laboratory Manager

Enclosures (7)

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 179378 Job #: 12512
Sample Name: GP31-020310 Co. Lab#:
Company: SLR International Corp
Date Sampled: 2/03/2010
Container: Cali-5-Bond Bag
Field/Site Name: Former City of Yakima Landfill
Location:
Formation/Depth:
Sampling Point:
Date Received: 2/04/2010 Date Reported: 2/12/2010

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	nd			
Argon	0.0594			
Oxygen	0.17			
Nitrogen	4.53			
Carbon Dioxide	35.48			
Methane	59.75			
Ethane	0.0025			
Ethylene	0.0001			
Propane	0.0005			
Iso-butane	0.0004			
N-butane	0.0003			
Iso-pentane	0.0004			
N-pentane	0.0005			
Hexanes +	0.0026			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 606
Specific gravity, calculated: 0.917

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 179379 Job #: 12512
Sample Name: GP33-020310 Co. Lab#:
Company: SLR International Corp
Date Sampled: 2/03/2010
Container: Cali-5-Bond Bag
Field/Site Name: Former City of Yakima Landfill
Location:
Formation/Depth:
Sampling Point:
Date Received: 2/04/2010 Date Reported: 2/12/2010

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	nd			
Argon	0.895			
Oxygen	0.088			
Nitrogen	74.64			
Carbon Dioxide	11.21			
Methane	13.17			
Ethane	0.0004			
Ethylene	nd			
Propane	0.0001			
Iso-butane	0.0001			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0007			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 133
Specific gravity, calculated: 0.979

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 179380 Job #: 12512
Sample Name: GP11-020310 Co. Lab#:
Company: SLR International Corp
Date Sampled: 2/03/2010
Container: Cali-5-Bond Bag
Field/Site Name: Former City of Yakima Landfill
Location:
Formation/Depth:
Sampling Point:
Date Received: 2/04/2010 Date Reported: 2/12/2010

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	nd			
Argon	0.0562			
Oxygen	0.13			
Nitrogen	4.30			
Carbon Dioxide	35.51			
Methane	60.00			
Ethane	0.0023			
Ethylene	0.0001			
Propane	0.0002			
Iso-butane	0.0003			
N-butane	0.0001			
Iso-pentane	0.0001			
N-pentane	0.0001			
Hexanes +	0.0017			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 609
Specific gravity, calculated: 0.916

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 179381 Job #: 12512
Sample Name: GP13-020310 Co. Lab#:
Company: SLR International Corp
Date Sampled: 2/03/2010
Container: Cali-5-Bond Bag
Field/Site Name: Former City of Yakima Landfill
Location:
Formation/Depth:
Sampling Point:
Date Received: 2/04/2010 Date Reported: 2/12/2010

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	nd			
Argon	0.173			
Oxygen	0.079			
Nitrogen	14.87			
Carbon Dioxide	40.62			
Methane	44.26			
Ethane	0.0009			
Ethylene	0.0001			
Propane	0.0002			
Iso-butane	0.0001			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0013			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 449
Specific gravity, calculated: 1.010

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 179382 Job #: 12512
Sample Name: GP19-020310 Co. Lab#:
Company: SLR International Corp
Date Sampled: 2/03/2010
Container: Cali-5-Bond Bag
Field/Site Name: Former City of Yakima Landfill
Location:
Formation/Depth:
Sampling Point:
Date Received: 2/04/2010 Date Reported: 2/12/2010

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	0.0440			
Argon	0.0094			
Oxygen	0.15			
Nitrogen	0.69			
Carbon Dioxide	35.37			
Methane	63.73			
Ethane	0.0029			
Ethylene	0.0005			
Propane	0.0003			
Iso-butane	0.0007			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	0.0012			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 647
Specific gravity, calculated: 0.899

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC

ANALYSIS REPORT

Lab #: 179383 Job #: 12512
Sample Name: GP3-020310 Co. Lab#:
Company: SLR International Corp
Date Sampled: 2/03/2010
Container: Cali-5-Bond Bag
Field/Site Name: Former City of Yakima Landfill
Location:
Formation/Depth:
Sampling Point:
Date Received: 2/04/2010 Date Reported: 2/12/2010

Component	Chemical mol. %	Delta 13C per mil	Delta D per mil	Delta 15N per mil
Carbon Monoxide	nd			
Hydrogen Sulfide	nd			
Helium	nd			
Hydrogen	nd			
Argon	0.893			
Oxygen	0.12			
Nitrogen	74.67			
Carbon Dioxide	11.22			
Methane	13.10			
Ethane	0.0005			
Ethylene	nd			
Propane	0.0001			
Iso-butane	0.0001			
N-butane	nd			
Iso-pentane	nd			
N-pentane	nd			
Hexanes +	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.7psia, calculated: 133
Specific gravity, calculated: 0.979

nd = not detected. na = not analyzed. Isotopic composition of carbon is relative to VPDB. Isotopic composition of hydrogen is relative to VSMOW. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %. Chemical analysis based on standards accurate to within 2%

ISOTECH®
ISOTECH LABORATORIES INC
www.isotechlabs.com

Isotech Gas Data

Job 12512

Former City of Yakima Landfill

Isotech Lab No.	Sample Name	GC date	He %	H_2 %	Ar %	O_2 %	CO_2 %	N_2 %	CO %	C_1 %	C_2 %	C_2H_4 %	C_3 %	iC_4 %	nC_4 %	iC_5 %	nC_5 %	C_6+ %	Specific Gravity	BTU
179378	GP31-020310	2/05/2010	0	0	0.0594	0.17	35.48	4.53	0	59.75	0.0025	0.0001	0.0005	0.0004	0.0003	0.0004	0.0005	0.0026	0.917	606
179379	GP33-020310	2/05/2010	0	0	0.895	0.088	11.21	74.64	0	13.17	0.0004	0	0.0001	0.0001	0	0	0	0.0007	0.979	133
179380	GP11-020310	2/05/2010	0	0	0.0562	0.13	35.51	4.30	0	60.00	0.0023	0.0001	0.0002	0.0003	0.0001	0.0001	0.0001	0.0017	0.916	609
179381	GP13-020310	2/05/2010	0	0	0.173	0.079	40.62	14.87	0	44.26	0.0009	0.0001	0.0002	0.0001	0	0	0	0.0013	1.01	449
179382	GP19-020310	2/08/2010	0	0.044	0.0094	0.15	35.37	0.69	0	63.73	0.0029	0.0005	0.0003	0.0007	0	0	0	0.0012	0.899	647
179383	GP3-020310	2/08/2010	0	0	0.893	0.12	11.22	74.67	0	13.1	0.0005	0	0.0001	0.0001	0	0	0	0	0.979	133

Chemical analysis based on standards accurate to within 2%

ISOTECH

Send Data and Invoice to

Name: MIKE STATON
Company: SLR INT'L CORP
Address: 22122 20TH AVE SE, H-150
BOTHELL, WA 98021
Phone: (425) 402-8800
Fax: (425) 402-8488
Email: mstaton@slrcorp.com

Project: Former City of Yakima Landfill
Location: Yakima, WA
Sampled by: CHRIS LEE

Circle one:
(Standard)
Priority
Rush

Analysis Package Codes on Back

Isotech Laboratories, Inc.
1308 Parkland Court
Champaign, IL 61821
Phone: 217-398-3490
Fax: 217-398-3493
www.isotechlabs.com
mail@isotechlabs.com

Sample Description

Container Number	Sample Identification	Date Sampled	Time	Analyses Requested: Comprehensive Analysis			Comments
	GP31-020310	2/3/2010	0845	X			
	GP33-020310		0900	X			
	GP11-020310		0915	X			
	GP13-020310		0930	X			
	GP19-020310		1120	X			
	GP3-020310		1255	X			

Chain-of-Custody Record

	Signature	Company	Date	Time
Relinquished by		SLR	2/3/2010	1430
Received by				
Relinquished by				
Received by				
Relinquished by				
Received by				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

February 17, 2010

Mike Staton, Project Manager
SLR International Corp.
22122 20th Ave. SE., H-150
Bothell, WA 98021

Dear Mr. Staton:

Included are the results from the testing of material submitted on February 5, 2010 from the Former City of Yakima Landfill 001.0221.00006, F&BI 002062 project. There are 7 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SLR0217R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 5, 2010 by Friedman & Bruya, Inc. from the SLR International Corp. Former City of Yakima Landfill 001.0221.00006, F&BI 002062 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	SLR International Corp.
002062-01	RG1-0210

The sample was sent to Aquatic Research for sodium and iron analyses. Review of the enclosed report indicates that all quality assurance was acceptable.

All quality control requirements were acceptable.

Date of Report: 02/17/10
Date Received: 02/05/10
Project: Former City of Yakima Landfill 001.0221.00006, F&BI 002062
Date Analyzed: 02/05/10

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH USING EPA METHOD 9040C

Sample ID Laboratory ID	pH
RG1-0210 002062-01	8.04

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	RG1-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002062
Date Extracted:	02/09/10	Lab ID:	002062-01
Date Analyzed:	02/09/10	Data File:	002062-01.010
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	95	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.447
Manganese	2.72

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006, F&BI 002062
Date Extracted:	02/09/10	Lab ID:	I0-0074 mb
Date Analyzed:	02/09/10	Data File:	I0-0074 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	90	60	125
Indium	90	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.150
Manganese	<1

Date of Report: 02/17/10
Date Received: 02/05/10
Project: Former City of Yakima Landfill 001.0221.00006, F&BI 002062

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH BY METHOD 9040C

Laboratory Code: 002061-01 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
pH	6.60	6.65	1	0-20

Date of Report: 02/17/10
Date Received: 02/05/10
Project: Former City of Yakima Landfill 001.0221.00006, F&BI 002062

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 002062-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	ug/L (ppb)	0.447	0.473	6	0-20
Manganese	ug/L (ppb)	2.72	2.73	0	0-20

Laboratory Code: 002062-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	0.447	124	50-150
Manganese	ug/L (ppb)	20	2.72	102	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	94	70-130
Manganese	ug/L (ppb)	20	97	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI005-95**	**PAGE 1**	
REPORT DATE:	**02/15/10**		
DATE SAMPLED:	**02/04/10**	**DATE RECEIVED:**	**02/05/10**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 002062

CASE NARRATIVE

One water sample was received by the laboratory in good condition. Analysis was performed according to the chain of custody received with the sample. No difficulties were encountered in the preparation or analysis of this sample. Sample data follows while QA/QC data is contained on the following page.

SAMPLE DATA

		DISSOLVED METALS	
SAMPLE ID	NITRATE (mg/L)	SODIUM (mg/L)	IRON (mg/L)
RG1-0210	0.321	6.54	<0.020

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: FBI005-95 **PAGE 2**

REPORT DATE: 02/15/10

DATE SAMPLED: 02/04/10 **DATE RECEIVED:** 02/05/10

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 002062

QA/QC DATA

		DISSOLVED METALS	
QC PARAMETER	NITRATE (mg/L)	SODIUM (mg/L)	IRON (mg/L)
METHOD	SM184500N03F	EPA 200.7	EPA 200.7
DATE ANALYZED	02/05/10	02/12/10	02/12/10
DETECTION LIMIT	0.010	0.500	0.020
DUPLICATE			
SAMPLE ID	BATCH	BATCH	BATCH
ORIGINAL	0.232	23.8	<0.020
DUPLICATE	0.218	23.7	<0.020
RPD	6.32%	0.63%	NC
SPIKE SAMPLE			
SAMPLE ID	BATCH	BATCH	BATCH
ORIGINAL	0.232	23.8	<0.020
SPIKED SAMPLE	0.437	34.4	9.26
SPIKE ADDED	0.200	10.0	10.0
% RECOVERY	102.37%	105.39%	92.59%
QC CHECK			
FOUND	0.408	9.40	9.31
TRUE	0.408	10.0	10.0
% RECOVERY	100.06%	93.96%	93.06%
BLANK	<0.010	<0.500	<0.020

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TO LOW RELATIVE TOO SAMPLE CONCENTRATION.

SUBMITTED BY:

Steven Lazoff
Laboratory Director

002062

SAMPLE CHAIN OF CUSTODY

ME 02/05/10 A12

Send Report To Mike Staton
Company SLR International Corp
Address 22122 20th Ave SE, H-150
City, State, ZIP Bothell, WA 98021
Phone # (425) 402-8800 Fax # (425) 402-8488

SAMPLERS (signature)

PROJECT NAME/NO. Former City of Yakima Landfill 001.0221.00006

PO # 001.0221.00006

REMARKS * Sample for dissolved metals by 200.8 has NOT been field filtered, and should be analyzed for: dissolved arsenic, sodium, iron, & manganese.

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Dissolved Metals by 200.8 *	Nitrate by 300.0	pH by 150.1				Notes
RG1-0210	01 A-C	2/4/10	1100	Water	3							X	X	X				

Samples received at 0 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	[signature]	Chris Lee	SLR	2/5/10	0855
Received by:	[signature]	HONG NGUYEN	FBI	✓	9:00
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

February 17, 2010

Mike Staton, Project Manager
SLR International Corp.
22122 20th Ave. SE., H-150
Bothell, WA 98021

Dear Mr. Staton:

Included are the results from the testing of material submitted on February 5, 2010 from the Former City of Yakima Landfill 001.0221.00006, F&BI 002061 project. There are 34 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SLR0217R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 5, 2010 by Friedman & Bruya, Inc. from the SLR International Corp. Former City of Yakima Landfill 001.0221.00006, F&BI 002061 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	SLR International Corp.
002061-01	MW16-0210
002061-02	MW37-0210
002061-03	MW38-0210
002061-04	MW17-0210
002061-05	MW15-0210
002061-06	MW14-0210
002061-07	MW11-0210
002061-08	MW18-0210
002061-09	MW7-0210
002061-10	MW8-0210
002061-11	MW13-0210
002061-12	MW12-0210
002061-13	MW9A-0210

The samples were sent to Aquatic Research for nitrate, chloride, sulfate, alkalinity, calcium, sodium, iron, and magnesium analyses. Review of the enclosed report indicates that all quality assurance was acceptable.

All quality control requirements were acceptable.

Date of Report: 02/17/10
Date Received: 02/05/10
Project: Former City of Yakima Landfill 001.0221.00006, F&BI 002061
Date Analyzed: 02/05/10

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH USING EPA METHOD 9040C

Sample ID Laboratory ID	pH
MW16-0210 002061-01	6.60
MW37-0210 002061-02	6.36
MW38-0210 002061-03	6.23
MW17-0210 002061-04	6.67
MW15-0210 002061-05	6.66
MW14-0210 002061-06	7.19
MW11-0210 002061-07	6.50
MW18-0210 002061-08	6.57
MW7-0210 002061-09	6.47
MW8-0210 002061-10	6.28
MW13-0210 002061-11	7.22
MW12-0210 002061-12	6.34
MW9A-0210 002061-13	6.65

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW16-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-01
Date Analyzed:	02/09/10	Data File:	002061-01.013
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	102	60	125
Indium	99	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.715
Manganese	917

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW37-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-02
Date Analyzed:	02/09/10	Data File:	002061-02.014
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	109	60	125
Indium	105	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	1.20
Manganese	1,750

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW38-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-03
Date Analyzed:	02/09/10	Data File:	002061-03.015
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	103	60	125
Indium	100	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.968
Manganese	6,210

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW17-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-04
Date Analyzed:	02/09/10	Data File:	002061-04.017
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	114	60	125
Indium	105	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.847
Manganese	2,580

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW15-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-05
Date Analyzed:	02/09/10	Data File:	002061-05.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	102	60	125
Indium	100	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.706
Manganese	1,080

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW14-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-06
Date Analyzed:	02/09/10	Data File:	002061-06.019
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	100	60	125
Indium	96	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.322
Manganese	2.88

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW11-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-07
Date Analyzed:	02/09/10	Data File:	002061-07.020
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	111	60	125
Indium	102	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	3.01
Manganese	1,610

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW18-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-08
Date Analyzed:	02/09/10	Data File:	002061-08.021
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	123	60	125
Indium	109	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	2.08
Manganese	5,360

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW7-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-09
Date Analyzed:	02/09/10	Data File:	002061-09.022
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125
Indium	99	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.385
Manganese	1,590

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW8-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-10
Date Analyzed:	02/09/10	Data File:	002061-10.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	96	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.925
Manganese	6,290

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW13-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-11
Date Analyzed:	02/09/10	Data File:	002061-11.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	97	60	125
Indium	93	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.262
Manganese	192

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW12-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-12
Date Analyzed:	02/09/10	Data File:	002061-12.025
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	102	60	125
Indium	99	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.867
Manganese	767

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW9A-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	002061-13
Date Analyzed:	02/09/10	Data File:	002061-13.026
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	100	60	125
Indium	96	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	0.996
Manganese	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/09/10	Lab ID:	I0-0074 mb
Date Analyzed:	02/09/10	Data File:	I0-0074 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	90	60	125
Indium	90	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.150
Manganese	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW16-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-01
Date Analyzed:	02/05/10	Data File:	020510.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	65	127
Toluene-d8	99	69	127
4-Bromofluorobenzene	98	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW37-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-02
Date Analyzed:	02/05/10	Data File:	020511.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	65	127
Toluene-d8	101	69	127
4-Bromofluorobenzene	101	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW38-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-03
Date Analyzed:	02/05/10	Data File:	020512.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	65	127
Toluene-d8	101	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW17-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-04
Date Analyzed:	02/05/10	Data File:	020513.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	65	127
Toluene-d8	100	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW15-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-05
Date Analyzed:	02/05/10	Data File:	020514.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	65	127
Toluene-d8	99	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW14-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-06
Date Analyzed:	02/05/10	Data File:	020515.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	65	127
Toluene-d8	101	69	127
4-Bromofluorobenzene	98	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW11-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-07
Date Analyzed:	02/05/10	Data File:	020516.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	65	127
Toluene-d8	101	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW18-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-08
Date Analyzed:	02/05/10	Data File:	020517.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	65	127
Toluene-d8	102	69	127
4-Bromofluorobenzene	97	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW7-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-09
Date Analyzed:	02/05/10	Data File:	020518.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	65	127
Toluene-d8	100	69	127
4-Bromofluorobenzene	99	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW8-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-10
Date Analyzed:	02/05/10	Data File:	020519.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	65	127
Toluene-d8	102	69	127
4-Bromofluorobenzene	101	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW13-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-11
Date Analyzed:	02/05/10	Data File:	020520.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	65	127
Toluene-d8	99	69	127
4-Bromofluorobenzene	98	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW12-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-12
Date Analyzed:	02/05/10	Data File:	020521.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	65	127
Toluene-d8	101	69	127
4-Bromofluorobenzene	100	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW9A-0210	Client:	SLR International Corp.
Date Received:	02/05/10	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	002061-13
Date Analyzed:	02/05/10	Data File:	020522.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	65	127
Toluene-d8	100	69	127
4-Bromofluorobenzene	98	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	SLR International Corp.
Date Received:	Not Applicable	Project:	001.0221.00006, F&BI 002061
Date Extracted:	02/05/10	Lab ID:	00108 mb
Date Analyzed:	02/05/10	Data File:	020506.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	65	127
Toluene-d8	100	69	127
4-Bromofluorobenzene	101	77	156

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2

Date of Report: 02/17/10
Date Received: 02/05/10
Project: Former City of Yakima Landfill 001.0221.00006, F&BI 002061

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR pH BY METHOD 9040C

Laboratory Code: 002061-01 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
pH	6.60	6.65	1	0-20

Date of Report: 02/17/10
Date Received: 02/05/10
Project: Former City of Yakima Landfill 001.0221.00006, F&BI 002061

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 002062-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	ug/L (ppb)	0.447	0.473	6	0-20
Manganese	ug/L (ppb)	2.72	2.73	0	0-20

Laboratory Code: 002062-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	0.447	124	50-150
Manganese	ug/L (ppb)	20	2.72	102	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	94	70-130
Manganese	ug/L (ppb)	20	97	70-130

Date of Report: 02/17/10
Date Received: 02/05/10
Project: Former City of Yakima Landfill 001.0221.00006, F&BI 002061

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 001199-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Vinyl chloride	ug/L (ppb)	5.4	5.2	4

Laboratory Code: 001199-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	100	91 b	35-159

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	97	94	53-131	3

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER:	**FBI005-94**		**PAGE 1**
REPORT DATE:	**02/15/10 REVISED 03/02/10**		
DATE SAMPLED:	**02/04/10**	**DATE RECEIVED:**	**02/05/10**

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 002061

CASE NARRATIVE

Thirteen water samples were received by the laboratory in good condition and analyzed according to the chain of custody. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on subsequent pages. To report has been revised to reflect the reanalysis of sample MW37-0210 for Nitrate and all samples for dissolved iron.

SAMPLE DATA

SAMPLE ID	ALKALINITY (mgCaCO3/l)	SULFATE (mg/L)	CHLORIDE (mg/L)	NITRATE (mg/L)
MW16-210	192	10.6	26.7	0.018
MW37-0210	264	<1.00	23.6	11.2
MW38-210	188	55.0	112	94.7
MW17-0210	284	3.12	22.3	0.806
MW15-0210	128	<1.00	10.9	0.015
MW14-0210	62.2	14.6	29.8	2.71
MW11-0210	196	<1.00	11.9	0.028
MW18-0210	356	<1.00	19.7	0.134
MW7-0210	263	1.40	24.1	10.3
MW8-0210	187	53.3	111	95.3
MW13-0210	57.4	12.5	6.33	0.201
MW12-0210	98.4	3.68	10.6	0.024
MW9A-0210	118	12.7	13.1	2.80

	DISSOLVED METALS			
SAMPLE ID	CALCIUM (mg/L)	SODIUM (mg/L)	IRON (mg/L)	MAGNESIUM (mg/L)
MW16-210	37.8	23.8	<0.020	12.2
MW37-0210	57.5	28.9	0.851	18.1
MW38-210	109	51.8	<0.020	54.2
MW17-0210	47.8	27.8	1.75	16.5
MW15-0210	23.5	11.3	0.876	8.68
MW14-0210	19.9	15.9	<0.020	7.33
MW11-0210	31.6	20.1	7.20	11.0
MW18-0210	69.4	21.7	4.91	25.2
MW7-0210	52.4	28.6	0.022	17.9
MW8-0210	118	52.6	<0.020	54.5
MW13-0210	18.0	9.37	0.495	1.64
MW12-0210	17.4	16.7	3.00	5.67
MW9A-0210	26.8	14.4	<0.020	8.92

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: FBI005-94

REPORT DATE: 02/15/10 REVISED 03/02/10

DATE SAMPLED: 02/04/10 **DATE RECEIVED:** 02/05/10

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 002061

QA/QC DATA

QC PARAMETER	ALKALINITY (mgCaCO3/l)	SULFATE (mg/L)	CHLORIDE (mg/L)	NITRATE (mg/L)
METHOD	SM18 2320B	SM184500SO4E	SM18 4500CL-C	SM184500N03F
DATE ANALYZED	02/15/10	02/12/10	02/10/10	02/05/10
DETECTION LIMIT	1.00	1.00	0.50	0.010
DUPLICATE				
SAMPLE ID	MW9A-0210	MW9A-0210	MW9A-0210	MW9A-0210
ORIGINAL	118	12.7	13.1	2.80
DUPLICATE	117	12.8	12.9	2.82
RPD	0.09%	0.59%	1.94%	0.61%
SPIKE SAMPLE				
SAMPLE ID		MW9A-0210	MW9A-0210	MW9A-0210
ORIGINAL		12.7	13.1	
SPIKED SAMPLE		23.0	22.7	
SPIKE ADDED		10.0	10.0	
% RECOVERY	NA	102.61%	95.23%	OR
QC CHECK				
FOUND	98.8	10.1	28.9	0.408
TRUE	100	10.0	30.0	0.408
% RECOVERY	98.80%	100.91%	96.45%	100.06%
BLANK	NA	<1.00	<0.50	<0.010

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: FBI005-94 **PAGE 3**

REPORT DATE: 02/15/10 REVISED 03/02/10

DATE SAMPLED: 02/04/10 **DATE RECEIVED:** 02/05/10

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 002061

QA/QC DATA

	DISSOLVED METALS			
QC PARAMETER	CALCIUM (mg/L)	SODIUM (mg/L)	IRON (mg/L)	MAGNESIUM (mg/L)
METHOD	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
DATE ANALYZED	02/12/10	02/12/10	03/02/10	02/12/10
DETECTION LIMIT	0.100	0.500	0.020	0.100
DUPLICATE				
SAMPLE ID	MW16-210	MW16-210	MW17-0210	MW16-210
ORIGINAL	37.8	23.8	1.75	12.2
DUPLICATE	37.7	23.7	1.76	12.1
RPD	0.20%	0.63%	0.68%	0.49%
SPIKE SAMPLE				
SAMPLE ID	MW16-210	MW16-210	MW17-0210	MW16-210
ORIGINAL		23.8	1.75	12.2
SPIKED SAMPLE		34.4	11.6	20.6
SPIKE ADDED		10.0	10.0	10.0
% RECOVERY	OR	105.39%	98.26%	84.03%
QC CHECK				
FOUND	10.7	9.40	10.0	9.67
TRUE	10.0	10.0	10.0	10.0
% RECOVERY	107.23%	93.96%	100.49%	96.74%
BLANK	<0.100	<0.500	<0.020	<0.100

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Steven Lazoff
Laboratory Director

002061

SAMPLE CHAIN OF CUSTODY

ME 02/05/10

V4/BI4

Page # 1 of 2

Send Report To: Mike Staton

Company: SLR International Corp

Address: 22122 20th Ave SE, H-150

City, State, ZIP: Bothell, WA 98021

Phone #: (425) 402-8500 Fax #: (425) 402-8488

SAMPLERS (signature):

PROJECT NAME/NO.: Former City of Yakima Landfill 001.0221.00006

PO #: 001.0221.00006

REMARKS: *Samples for Dissolved Metals by 200.8 have been field-filtered, and should be analyzed for: dissolved arsenic, calcium, sodium, iron, magnesium & manganese

TURNAROUND TIME
- [X] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [X] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Dissolved Metals by 200.8 *	Vinyl Chloride by 8260C	Nitrate, chloride, & sulfate by 300.0	pH by 150.1	Alkalinity (carbonate & bicarbonate) 310.1	Notes
MW16-0210	01 A-F	2/4/10	0900	Water	6							X	X	X	X	X	
MW37-0210	02 A-F		0915														
MW38-0210	03 A-F		0930														
MW17-0210	04 A-F		1000														
MW15-0210	05 A-F		1045														
MW14-0210	06 A-F		1130														
MW11-0210	07 A-F		1215														
MW18-0210	08 A-F		1230														
MW7-0210	09 A-F		1300														
MW8-0210	10 A-F	↓	1315	↓	↓							↓	↓	↓	↓	↓	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	CHRIS LEE	SLR	2/5/10	0855
Received by:	HONG NGUYEN	FBI	"	9:00
Relinquished by:				
Received by:		Samples received at ~~6~~ °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

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002061

SAMPLE CHAIN OF CUSTODY ME 02/05/10 V4/ BDY

Send Report To Mike Slaton
Company SLR International Corp
Address 22122 20th Ave SE, H-150
City, State, ZIP Bothell, WA 98021
Phone # (425) 402-8800 Fax # (425) 402-8488

SAMPLERS (signature)

PROJECT NAME/NO.: Former City of Yakima Landfill 001.0321.00006
PO #: 001.0321.00006

REMARKS *Samples for dissolved metals by 200.8 have been field-filtered and should be analyzed for: dissolved arsenic, calcium, sodium, iron, magnesium, and manganese

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
- [x] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Dissolved metals by 200.8 *	Vinyl Chloride by 8260C	Nitrate, chloride, & sulfate by 300.0	pH by 150.1	Alkalinity (carbonate & bicarbonate) 310.1	Notes
MW13-0210	11 A-F	2/4/10	1345	Water	6							X	X	X	X	X	
MW12-0210	12 A-F	↓	1415	↓	↓							↓	↓	↓	↓	↓	
MW9A-0210	13 A-F	↓	1430	↓	↓							↓	↓	↓	↓	↓	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Chris Lee	SLR	2/5/10	0855
Received by:	HONG NGUYEN	FBI	2	9:00
Relinquished by:				
Received by:		Samples received at 4 °C		

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

March 4, 2010

Mike Staton, Project Manager
SLR International Corp.
22122 20th Ave. SE., H-150
Bothell, WA 98021

Dear Mr. Staton:

Included are the additional results from the testing of material submitted on February 5, 2010 from the Former City of Yakima Landfill 001.0221.00006, F&BI 002061 project. There are 17 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SLR0304R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 5, 2010 by Friedman & Bruya, Inc. from the SLR International Corp. Former City of Yakima Landfill 001.0221.00006, F&BI 002061 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	SLR International Corp.
002061-01	MW16-0210
002061-02	MW37-0210
002061-03	MW38-0210
002061-04	MW17-0210
002061-05	MW15-0210
002061-06	MW14-0210
002061-07	MW11-0210
002061-08	MW18-0210
002061-09	MW7-0210
002061-10	MW8-0210
002061-11	MW13-0210
002061-12	MW12-0210
002061-13	MW9A-0210

All quality control requirements were acceptable.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-01	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022507.D
Client Sample ID:	MW16-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-02	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022509.D
Client Sample ID:	MW37-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-03	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022510.D
Client Sample ID:	MW38-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-04	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022511.D
Client Sample ID:	MW17-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-05	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022512.D
Client Sample ID:	MW15-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-06	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022513.D
Client Sample ID:	MW14-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-07	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022514.D
Client Sample ID:	MW11-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-08	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022515.D
Client Sample ID:	MW18-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-09	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022516.D
Client Sample ID:	MW7-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-10	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022517.D
Client Sample ID:	MW8-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-11	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022518.D
Client Sample ID:	MW13-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-12	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022519.D
Client Sample ID:	MW12-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	002061-13	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022520.D
Client Sample ID:	MW9A-0210	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Note: The sample was analyzed outside of recommended holding time.

Analysis For Volatile Compounds By Method 524.2

Client:	SLR International Corp.	Report Date:	03/04/10
Project:	Former City of Yakima Landfill	Date Collected:	02/04/10
Lab ID:	524.2 MB 00204	Date Received:	02/05/10
Date Extracted:	02/25/10	Data File:	022506.D
Client Sample ID:	Method Blank	Matrix:	Water

Compounds:	Concentration	RL	MCL	Units	Method
Vinyl chloride	<0.03 j	0.2	2	ug/L (ppb)	524.2

Date of Report: 03/04/10
Date Received: 02/05/10
Project: Former City of Yakima Landfill 001.0221.00006, F&BI 002061

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY METHOD 524.2

Laboratory Code: 002061-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Vinyl chloride	ug/L (ppb)	<0.03 j	<0.03 j	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	98	100	70-130	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

002061

SAMPLE CHAIN OF CUSTODY

ME 02/05/10

V4/BI4

Page # 1 of 2

Send Report To: Mike Staton
Company: SLR International Corp
Address: 22122 20th Ave SE, H-150
City, State, ZIP: Bothell, WA 98021
Phone #: (425) 402-8800 Fax #: (425) 402-8488

SAMPLERS (signature):

PROJECT NAME/NO.: Former City of Yakima Landfill 001.0221.00006

PO #: 001.0221.00006

REMARKS: *Samples for Dissolved Metals by 200.8 have been field-filtered and should be analyzed for: dissolved arsenic, calcium, sodium, iron, magnesium & manganese

TURNAROUND TIME
- [X] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [X] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Dissolved Metals by 200.8 *	Vinyl Chloride by 8260C	Nitrate, Chloride, & Sulfate by 300.0	pH by 150.1	Alkalinity (Carbonate & Bicarbonate) 310.1	Vinyl chloride to <0.03 µg/L for MS/MSD	Notes
MW16-0210	01 A-F	2/4/10	0900	Water	6							X	X	X	X	X	✓	
MW37-0210	02 A-F		0915															
MW38-0210	03 A-F		0930															
MW17-0210	04 A-F		1000															
MW15-0210	05 A-F		1045															
MW14-0210	06 A-F		1130															
MW11-0210	07 A-F		1215															
MW18-0210	08 A-F		1230															
MW7-0210	09 A-F		1300															
MW8-0210	10 A-F	↓	1315	↓	↓													

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	CHRIS LEE	SLR	2/5/10	0855
Received by:	HONG NGUYEN	FBI	"	9:00
Relinquished by:				
Received by:		Samples received at ___ °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

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002061

SAMPLE CHAIN OF CUSTODY ME 02/05/10 V4/ BIY

Page # 2 of 2

Send Report To Mike Slaton
Company SLR International Corp
Address 22122 20th Ave SE, # 150
City, State, ZIP Bothell, WA 98021
Phone # (425) 402-8800 Fax # (425) 402-8488

SAMPLERS (signature)

PROJECT NAME/NO.: Former City of Yakima Landfill 001.0321.00006

PO #: 001.0321.00006

REMARKS *Samples for dissolved metals by 200.8 have been field-filtered and should be analyzed for: dissolved arsenic, calcium, Sodium, iron, magnesium, and manganese

TURNAROUND TIME
- [X] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [X] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Dissolved metals by 200.8 *	Vinyl Chloride by 8260C	Nitrate, chloride, & sulfate by 300.0	pH by 150.1	Alkalinity (carbonate & bicarbonate) 310.1	vinyl chloride to 0.02 ug/L per MS	Notes
MW13-0210	11 A-F	2/4/10	1345	Water	6							X	X	X	X	X	✓	
MW12-0210	12 A-F	↓	1415	↓	↓							↓	↓	↓	↓	↓	↓	
MW9A-0210	13 AF	↓	1430	↓	↓							↓	↓	↓	↓	↓	↓	

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Chris Lee	SLR	2/5/10	0855
Received by:	HONG NGUYEN	FBI	2	9:00
Relinquished by:				
Received by:				

Samples received at 4 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

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911050

SAMPLE CHAIN OF CUSTODY

ME 11-6-09

AI3

Page # 1 of 1

Send Report To

Company SLR - Mike Staton

Address MStaton@SLRcorp.com

City, State, ZIP

Phone # (425) 402-8800 Fax #

SAMPLERS (signature) Chris Kramer

PROJECT NAME/NO. 001.0221.00006 Yakima Landfill

PO #

REMARKS
* Dis. Metals: Arsenic, Sodium, Iron, Manganese - filtered in field

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Nitrate (300)	pH (150.1)	Dis. Metals* (200.8)				Notes
River-1109	01 A-B	11/05/09	1210	Surface water	2							X	X	X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Chris Kramer	Chris Kramer	SCR	11/5/09	1400
Received by: Nhan Phan	Nhan Phan	FeBI	11/6/09	0900
Relinquished by:				
Received by:		Samples received at 0 °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

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