TECHNICAL MEMORANDUM

Date:	October 11, 2011	**Project No.:**	073-93368-05.03
To:	Jerome Cruz	**Company:**	Washington State Department of Ecology
From:	Douglas Morell & Kirsi Longley		
cc:	Donald A. Robbins, Port of Seattle	**Email:**	DMorell@golder.com KLongley@golder.com

RE: ADDENDUM TO SEATAC DEVELOPMENT SITE RI/FS AND DRAFT CAP

1.0 INTRODUCTION

This Golder Associates Inc. (Golder) Technical Memorandum is an Addendum to the SeaTac Development Site's Remedial Investigation/Feasibility Study (RI/FS) and Draft Cleanup Action Plan (CAP) (Golder 2011a) that were submitted to the Washington Department of Ecology (Ecology) on April 14, 2011 and underwent a public comment period during May 2011. This addendum will be attached to Ecology's Responsiveness Summary to the Final CAP. The Port of Seattle comments (presented in a letter dated May 27, 2011) represented the bulk of comments received by Ecology. A conference call with Ecology, the Port of Seattle and the SeaTac Development Site's PLP Group (PLP Group) representatives was held on June 14, 2011 and a follow-up meeting was conducted on June 27, 2011 to discuss the Port of Seattle's comments. Based on the conference call and meeting with Ecology and the Port of Seattle, each comment was discussed and categorized according to the four following criteria:

- Category 1: Important issue to revise and re-issue the RI/FS or Draft CAP
- Category 2: Requires a written explanation as a response in the Responsiveness Summary or an amendment to the RI/FS or Draft CAP without re-issuing either document for public review
- Category 3: Requires a written explanation as a response in the Responsiveness Summary, does not require re-issuing of either the RI/FS or DCAP
- Category 4: Requires discussion among experts to further resolve during a meeting

An earlier Golder Technical Memorandum (dated June 16, 2011) (Golder 2011b) identified the appropriate category for each Port of Seattle comment based on discussions and agreements during the conference call on June 14, 2011 by the participants. There were no Category 1 issues identified and thus it is not necessary to revise and re-issue the RI/FS or the Draft CAP. Comments identified as Category 4 were discussed with experts representing Ecology, the Port of Seattle, and Golder. The meeting resolved Port of Seattle Category 4 comments. The intent of this document is that it be included as an Addendum to the SeaTac Development Site's RI/FS and CAP and included in the site administrative record at Ecology. This Addendum follows the general format of the Port of Seattle's May 27, 2011 letter.

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2.0 PORT OF SEATTLE WRITTEN COMMENTS & PRP GROUP RESPONSES

1. An outline of new Port RCF structures (Port property), north of South 160th Street, on figures would be useful to show current land use and adjacent site conditions.

   RESPONSE: The construction of the Port of Seattle facility north of South 160th Street has been continually changing and thus has not been included on any figures in the RI/FS and DCAP. However, all future figures will include the final layout of the new Port facility. To facilitate this update to base maps, the Port provided their most current aerial photographs of the Port property.

2. Identification of survey datums (not specified in RIFS §3.4) would be helpful for comparisons with Port data.

   RESPONSE: The survey datum used for the survey data in RI/FS Appendix E was NAD83 Washington State Planes, North Zone, US Foot for horizontal and City of SeaTac-NAVD 88 for vertical.

3. Preparation of geologic cross sections is highly recommended for hydrogeologic evaluation and for review of conclusions and proposed remediation alternatives. No geologic cross sections were presented in the RIFS or DCAP.

   RESPONSE: Geologic cross-sections are typically provided in RI/FS documents to illustrate complex geologic stratification. The geologic stratification at the site is not complex and therefore does not require detailed geologic cross-sections for illustration, but attached Figure 1 identifies the extent of the till discovered during site investigations.

4. The presence or absence of glacial till could affect contaminant migration and soil vapor pathways. Preliminary review indicates that the till unit appears to be discontinuous within the identified boundaries of the contaminant plumes[1]. A map of till thickness, and identification of any other confining units, would be very helpful for interpretations and evaluations.

   RESPONSE: The till at the site is present in the eastern, central and southern portions of the facility. However, the till is absent in the northwestern portion of the facility and was not observed in off-site borings within South 160th Street or in borings on the cemetery property to the west of the site where groundwater impacts are present. Figure 1 shows the limits where till was observed during borehole drilling. There were no other confining units of any extent or continuity observed during borehole drilling at the site.

5. About thirteen wells were used to define groundwater flow directions south of South 160th Street. However, there are no monitoring wells north of South 160th Street to define local flow directions on the Port property. Since the groundwater contours in this area are relatively flat (i.e. hydraulic gradients are small), there is no guarantee that flow directions on the Port property are the same as on the MasterPark site. Item 6, below, notes that there are logistical constraints in locating wells on the Port property.

   RESPONSE: A previous groundwater investigation by the Port of Seattle in 2004 was conducted north of South 160th Street near the intersection of South 160th Street and International Boulevard (EMS 2004). The Port of Seattle installed monitoring wells Port MW-1, Port MW-2, and Port MW-3 shown on the attached Figure 2 (as also depicted on Figure 4 of the Draft CAP). The Port of Seattle

[1] Absence of till is noted at MasterPark well MW-22 and Port borings (RCF baseline study) located about 90 feet north and 200 feet north-northwest of MasterPark well MW-16. Till has been interpreted on the site (e.g. MW-9, MW-1, and MW-7) and also on Port property (at the southeast corner and thence north along International Blvd).

concluded that groundwater within the Qva Aquifer was flowing toward the west, based on groundwater levels measured in their monitoring wells. Golder monitored water levels in these Port of Seattle wells and also concluded that the groundwater was flowing westerly on Port property north of South 160th Street. The analytical results of groundwater from the Port of Seattle wells did not detect any petroleum hydrocarbons or associated gasoline compounds in 2004 (EMS 2004).

The Port of Seattle also conducted baseline soil and groundwater investigations during 2008 at the beginning of the construction for the Rental Car Facility (RCF) (Aspect 2008). One borehole (designated NON-GW-DV) north of South 160th Street located north of the MasterPark Lot C Well MW-15 and two other boreholes (designated GTS-GW-TF and GTS-GW-FD) located north and northwest of MasterPark Lot C MW-22 were completed during this 2008 baseline study (see attached Figure 3). Soil and groundwater samples from these borings did not detect any petroleum compounds or gasoline compounds or additives. There was only a temporary well placed within each borehole for groundwater sampling. These were abandoned after one groundwater sampling event. Therefore, in 2008 there was no indication of groundwater impacts from MasterPark Lot C sources north of South 160th Street.

As noted, the groundwater hydraulic gradients are low, but there is no reason to suspect that the hydraulic gradients north of South 160th Street are significantly different than hydraulic gradients south of the South 160th Street. In the past, land north of South 160th Street was a large asphalt paved parking lot that prevented any significant area recharge via infiltration of meteoric rainfall. The currently constructed Port of Seattle facility is also expected to prevent significant area recharge from occurring due to the land being covered by impervious surfaces. Thus, there should be no significant change in groundwater flow pattern as a result of the new Port of Seattle facility.

In our meeting with Ecology and the Port of Seattle representatives on June 27, 2011, it was agreed that additional permanent monitoring wells will be installed at two locations on Port of Seattle property north of South 160th Street. The additional monitoring wells are designated Port MW-A and Port MW-B as shown on Figure 4 and was meant to better delineate any petroleum hydrocarbon plume north of South 160th Street (on Port of Seattle property) originating from the MasterPark Lot C facility.

Port MW-A and Port MW-B monitoring wells were installed during early August 2011. The borehole and monitoring logs for Port MW-A and Port MW-B are provided in Appendix A to this Addendum. The results of groundwater quality analysis from these two new monitoring wells are provided in Appendix B. No gasoline, diesel, or oil was detected in groundwater samples from Port MW-A well. Groundwater from the Port MW-B well had low level detects of gasoline, diesel, and BTEX in groundwater (benzene was 1.3 µg/L) detected; however, there were no organic compounds related to petroleum fuels detected above their respective MTCA Cleanup Levels. These groundwater quality results indicate that the gasoline plume originating from the MasterPark Facility is delineated to the north of the MW-15 well and northwest of MW-22.

The Port of Seattle will survey the geodetic X, Y, and Z locations for groundwater elevations and re-sample groundwater from Port MW-A and Port MW-B wells

again during Autumn, 2011. This information will be used to determine groundwater elevations at the new wells and confirm groundwater quality results from the first sampling event.

Groundwater Monitoring

6. The Compliance Monitoring Plan (CMP) (Attachment E to DCAP) proposes only one new monitoring well on Port property; MW-X was positioned about 270 feet northwest of MW-22, which appears to fall within an RCF structure. Logistical constraints, due to access issues associated with the new Rental Car Facility, are not addressed for locating monitoring well(s) on or near the Port property.

   RESPONSE: The location of MW-X was not a proposed exact location, but rather an approximate position. The layout of the facility under construction had to be considered for the final placement of MW-X.

   Based on our meeting with Ecology and the Port of Seattle representatives on June 27, 2011, the two additional permanent monitoring wells (Port MW-A and Port MW-B) were installed at two locations on Port of Seattle RFC property and within the S. 16th Street right-of-way, respectively, as shown on attached Figure 4. The results of groundwater quality analysis after well installation have been received and evaluated in response to Port of Seattle Comment #5 above. It is Golder's determination that the gasoline plume originating from the MasterPark Lot C facility is sufficiently delineated in the north direction. Preliminary results (Table B-1 in Appendix B) show that the Port MW-B monitoring well is detecting petroleum hydrocarbon contaminants below cleanup levels. Therefore, the plume's northwest extent appear to have been sufficiently characterized and unless these levels are exceeded in subsequent measurements from this well, MW-X will not be needed.

7. Would one well be sufficient for defining plume boundaries and monitoring natural attenuation on Port property?

   RESPONSE: We believe that one well would be sufficient to bound the groundwater petroleum hydrocarbon plume in the northeast direction from the source on the MasterPark Lot C facility with the data and information obtained by the Port of Seattle from earlier investigations they conducted on their property. Nevertheless, two additional wells (Port MW-A and Port MW-B) now have been installed and sampled, as agreed upon during a meeting with the Port of Seattle on June 27, 2011 (please see our response to Port of Seattle comment No. 5 above) and have provided data that helped delineate the MasterPark Lot C petroleum hydrocarbon plume to the north and northwest.

8. Well MW-23, located 130 feet east of MW-15, appears to have been removed from the monitoring well network (e.g. DCAP Figure 9 and Attachment E, Compliance Monitoring Plan §5.1). No monitoring well(s) is proposed to bound contaminant plumes on Port property north or east of MW-15. Should MW-23 be retained in the groundwater monitoring network?

   RESPONSE: MW-23 is a well up-gradient from the source on the MasterPark Lot C facility and was installed to confirm the non-detect results from the Port of Seattle's temporary Port MW-1, Port MW-2, and Port MW-3, formerly located on the RCF property at the northwest corner of the South 160th Street and

International Boulevard. Furthermore, installation and initial sampling of MW-23 was to confirm the non-detect results from other investigations conducted on the east side of International Boulevard that are also up-gradient to the MasterPark Lot C facility. Results collected from MW-23 confirmed there were no detections of contaminants from up-gradient potential sources. Because MW-23 is located up-gradient from the MasterPark Lot C source, Ecology and Golder determined this well no longer needs additional monitoring.

A monitoring well (designated Port MW-A on attached Figure 4) north of monitoring well MW-15 has been installed and sampled, as agreed during the June 27, 2011 meeting. Port MW-A well did bound the petroleum hydrocarbon plume north of MW-15.

Contaminant Plumes in the Regional Qva Aquifer

9. Gasoline and benzene plumes were estimated to be migrating to the northwest onto Port property (RIFS §4.4.2.1, pg 38). The methodology used (RIFS §4.4.2.1) assumed only an advective (bulk movement) process and further assumed a northwest groundwater flow direction. Contamination migration by diffusion and dispersion processes does not appear to have been addressed. The actual extent of gasoline and benzene plumes onto Port property has not been determined.

   RESPONSE: The actual extent of gasoline and benzene impacts within the Port of Seattle property north of South 160th Street is not fully delineated. As agreed during the June 27, 2011 meeting two additional monitoring wells (Port MW-A and Port MW-B) were installed to delineate the petroleum hydrocarbon plume migrating onto Port of Seattle property as discussed in our response to Port of Seattle comment No. 5. Preliminary results from these wells have provided a better picture of the plume's north and northwest extents.

   Diffusion is a solute migration process that results in very little actual migration of solutes in a groundwater flow system. Diffusion only needs to be considered as a solute migration mechanism through very low conductivity materials, such as clays, where groundwater advection is extremely slow with time. Dispersion processes can be estimated by installation and monitoring of the Port MW-B well together with groundwater monitoring results from MW-22, MW-16, and MW-12 for longitudinal dispersion. Because the hydraulic gradient is not uniform and does vary from northwest to southwest, transverse dispersion will not be able to be estimated from groundwater concentration profiles, but can be estimated based on longitudinal dispersivity.

10. Have the groundwater contaminant plumes been demonstrated to be shrinking, stable, or growing? Gasoline concentration data at MW-22, for example, may indicate an expanding plume.

    RESPONSE: Most of the on-site monitoring wells show groundwater concentrations to be declining, while the concentrations in groundwater from MW-22 location are increasing. We feel that the destruction of the source concentrations within the MasterPark Lot C facility groundwater will stabilize and start to reduce groundwater concentration off-site. The graph shown on Figure 4-1 of the RI/FS Report shows a declining concentration trends for groundwater at the SeaTac Development Site, except for MW-22. Further northwest of MW-22, preliminary results from Port MW-B well show contaminant concentrations

below MTCA Method A cleanup levels. The DCAP Compliance Monitoring Plan will use these and other wells along a centerline axis to determine plume stability under the natural attenuation component of the DCAP.

11. As noted in the RIFS, opportunities for monitoring wells are limited north of South 160th Street. One monitoring well was proposed on Port property, but see Item 6 related to logistical constraints.

    RESPONSE: This comment was addressed in our response to Port of Seattle Comment No. 5.

12. As groundwater flow directions on Port property have not been determined (Item 5), the assumption of northwest flow from MW-22 requires further investigation.

    RESPONSE: This comment was addressed in our response to Port of Seattle Comment No. 5

13. Analysis of diffusion and dispersion effects on contaminant migration would improve estimates of the extent of contamination plumes onto Port property.

    RESPONSE: Please see our response to Port of Seattle Comment No. 9.

14. For interpretation, it would be helpful to extend the time scale of groundwater COC time series (trend) plots to cover all available historical data. The plots currently show data from August 2007 to March 2010, while it appears that the first regional groundwater monitoring wells were installed and sampled in 2001.

    RESPONSE: We have provided the concentrations of gasoline and BTEX in wells that existed prior to 2007 in the appended table. This data was originally presented in the *Phase III Environmental Site Assessment SeaTac Parking Garage Development Site* report (Golder 2001) and was included in Appendix B of the RI/FS report (Golder 2010). The 2000 and 2001 data was not added to trend graphs because the data is limited in nature and does not provide a meaningful analysis when displayed on the time series graph alongside the more recent groundwater sampling data (2007-2010) for the following reasons:

    - MW-1 was the only well sampled in November 2000 that is still an active well on the site. However, MW-1 has not been sampled since 2001 because during each of the successive sampling events (2007, 2009, and 2010) this well has not had a sufficient volume of water to collect a sample. Sample results from MW-13 and MW-18 are sufficient to characterize this area of the site and thus MW-1 sample results are not necessary. Given that only two data points exist for MW-1, there is not enough data to display on a time series (trend) graph.
    - During the January 2001 sampling event, samples were collected from MW-1, MW-5, MW-6, MW-7, MW-8a, MW-9, and MW-10, as they were the only wells installed at the site at that time.
    - There were no sampling events between 2001 and 2007. It is difficult to display any sort of trend overtime when there are so few data points and such large gaps between sampling events.

    The gasoline and benzene data from 2000 and 2001 indicate that concentrations were generally higher than exist currently.

15. The extent of vertical migration of contaminants into the Qva aquifer should be more closely evaluated. Statements in the RIFS suggest no vertical migration has occurred (RIFS §4.4.2.1, pg 39 and §4.4.2.2, pg 40). However, deep well MW-10 was screened

about 95 below ground surface (bgs), about 40 feet into the aquifer, and had initial detections of gasoline at 1,600 µg/L and benzene at 31 µg/L after well installation in 2001. The boring log indicated petroleum odors and elevated PID readings to a depth of 60 feet below ground surface, or 15 feet into the aquifer saturated zone.

RESPONSE: Monitoring well MW-10 was drilled and installed in 2001 in a deeper portion of the aquifer in close proximity to MW-1, to determine the vertical hydraulic gradient in the regional aquifer at MW-1. In addition to establishing the vertical hydraulic gradient, MW-10 was utilized to determine if deeper portions of the aquifer had been impacted by petroleum hydrocarbon contamination. The groundwater concentrations from monitoring well MW-10 are much lower than the groundwater concentrations in MW-1 that is near MW-10 and received groundwater from the surface of the water table. As noted in the comment, the PID measurements obtained on soil samples during MW-10 borehole drilling indicated that petroleum impacts dramatically reduced below 60 feet. The impacts locally near the source are expected to have penetrated the surface of the water table by approximately 10 to 15 feet. After MW-10 installation, groundwater concentrations in 2001 slightly exceeded MTCA Levels in MW-10 (see the table below). However, subsequent sampling events in 2009 (two events) and 2010 (one event) have not detected gasoline in groundwater at MW-10 above the laboratory PQL (see below table of results). Furthermore, detections of benzene in MW-10 have steadily decreased over time and the last two sampling events have resulted in detections of benzene less than the MTCA Method A cleanup level. This detection could have been the result of contaminant carry-down during borehole drilling. These results from MW-10 indicate that vertical migration of COCs is not of concern; rather detections in MW-10 are due to carry-down of contamination during borehole drilling. As such, MW-10 will not be included in the compliance monitoring program.

Sampling Event Date	Gasoline Concentration (µg/L)	Benzene Concentration (µg/L)
January 8, 2001	**1,600**	**31**
May 20, 2009	<100	**8.7**
December 7, 2009	<100	2.9
March 2010	<100	1.1
MTCA Cleanup Level	800	5

Soil Vapor Issues

1. Vapor intrusion screening levels were exceeded near South 160th Street for groundwater (above Method B and very close to Method C) and for shallow soil (above Method B but below Method C). Assessment of vapor intrusion exposure pathways for any new RCF structures may be appropriate.

RESPONSE: The soil vapor sampling results indicate there is no risk from vapor intrusion into commercial buildings that are immediately adjacent to the source area within the MasterPark Lot C facility. There is no reason to suspect that there is a vapor intrusion concern further away from the source where groundwater concentrations are much less and the depth to groundwater is much greater. The groundwater quality results from the two additional monitoring wells (Port MW-A and Port MW-B) that were installed and sampled north of South

160th Street on Port of Seattle property indicate that there is no potential risk from vapor intrusion into the RCF building from vapors emanating from the groundwater.

2. The DCAP does not propose soil vapor monitoring or further vapor intrusion evaluation. The RIFS (§4.3.2) implies that a risk analysis for benzene using Method C, shallow soil, screening level (32 µg/L) found no risk to indoor commercial workers. The DCAP (§3.5.3) indicates that a vapor intrusion "Tier I preliminary assessment"[2] was performed with the conclusion that since "soil vapors are below shallow soil screening levels at the property boundary, there is no unacceptable risk from vapor intrusion into current commercial buildings to workers on the Site (but off of the MasterPark Facility)." The basis for stating that "soil vapors are below shallow soil screening levels" evidently refers to the benzene Method C, shallow-soil screening level of 32 µg/L. However, the benzene concentration in groundwater at MW-22 was 23 µg/L, which is very close to the MTCA C groundwater screening level of 24 µg/L. The elevated benzene concentration indicates that a vapor intrusion pathway from groundwater may need to be further evaluated under areas of the contaminant plume outside of the source area. Have off-site, potential vapor intrusion issues related to high benzene concentration in MW-22, observed during March 2010 sampling, been addressed?

   RESPONSE: The groundwater concentration of 24 µg/L is a conservative screening concentration in the Ecology guidance document based on shallow groundwater, not groundwater over 50 feet deep. The soil gas concentrations measured at 10 foot depths are a more direct indication of potential vapor intrusion risks than the use of underlying groundwater concentrations, because it directly measures the soil gas concentrations, rather than calculating a potential soil vapor concentration emanating from groundwater using many assumptions. In 2007, the soil vapor concentrations were all below the MTCA screening level for commercial buildings along MasterPark's northern property boundary where the underlying groundwater is less than 50 feet below land surface and has much higher benzene concentrations than those detected in MW-22. The measured soil gas concentrations in 2009 were again below the Ecology screening levels for commercial buildings near the source area along the MasterPark Lot C northern property boundary, where again the groundwater has much higher benzene concentrations and is shallower than at MW-22. The expected groundwater depths and groundwater concentrations within the Port of Seattle property north of South 160th Street are anticipated to also be deeper and at much lower concentrations than what exists at the MasterPark Lot C facility. The soil gas sampling results are a better indicator of potential vapor intrusion than groundwater concentrations and were the basis for our conclusions that no risk from vapor intrusion exists into adjacent commercial buildings and other commercial buildings at further distances from the MasterPark Lot C source area.

   We do not believe there is a potential threat from vapor intrusion in the RCF from groundwater. The groundwater quality results from the two additional monitoring wells (Port MW-A and Port MW-B) that were installed and sampled north of South 160th Street indicate volatile organic compounds concentrations are too low to be of concern for vapor intrusion into a commercial building.

[2] This terminology is not clear. Ecology (2009, pg 3-1) states that the recommended vapor intrusion evaluation process consists of three steps: Preliminary Assessment, Tier I Assessment, and Tier II Assessment.

3. The vapor intrusion risk analysis (RIFS §4.3.2) and "Tier I preliminary assessment" (DCAP§3.5.3) mentioned in the RIFS and DCAP, respectively, were not referenced and therefore not reviewed. Can these studies be provided for review? Did these studies evaluate the 2009 shallow soil vapor results near the Cemetery residence and the groundwater benzene concentrations in MW-22?

   RESPONSE: We did not do a formal Preliminary Assessment, because the existing groundwater impacts would require a Tier 1 Assessment at a minimum. The Tier 1 Assessment is based on the Ecology document "Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action" (Ecology, October 2009, Publication No. 09-09-047) as referenced in the introduction to Section 4.3. The Tier 1 approach asks basic questions and provides off-ramps for situations where it is apparent that subsurface contamination is very unlikely to pose a vapor intrusion threat. The vadose zone source area does not have a building in close proximity; therefore, the pathway of volatilization from groundwater and migration through the vadose zone is the only pathway off the MasterPark Lot C property to neighboring buildings and properties. To evaluate whether there is a potential threat from vapor intrusion, on-site soil gas concentrations were compared with Table B-1 of the Ecology referenced document. The locations, where soil vapor sampling was conducted in 2009 and many of the 2007 sampling locations, do not have a till stratum present that would impede vertical migration of soil vapors. Since the soil gas concentrations are below screening values in Table B-1 for soil gas immediately below a commercial/industrial building (although our samples were at 10 foot depths), the Tier 1 Assessment shows that there is no threat from vapor intrusion of site contaminants to off-site commercial or industrial buildings using either the 2007 or 2009 soil gas data.

   Vapor intrusion to the residence on the cemetery property was evaluated from the analytical results of soil vapor samples surrounding the house and the house crawl space atmosphere sample. The results and evaluation are presented in the RI/FS. The subject residential house has recently been demolished and the land will not be used for residential use in the foreseeable future.

4. Vapor migration pathways, such as subsurface utility line (SUL) trenches, have not been considered.

   RESPONSE: Our soil gas monitoring results represent a depth of 10 feet that is below typical utility installations. Therefore, the soil gas concentrations are lower than screening levels beneath anticipated utility corridors.

20. The RIFS and DCAP propose monitored natural attenuation (MNA) of the contaminant plumes, outside the treatment area and including off-site properties. The MNA process requires multiple lines of evidence for reaching a determination that natural attenuation is occurring, including (1) long-term decrease of contaminant concentrations, (2) assessment of geochemical parameters, and (3) microbial studies. Evaluation of monitored natural attenuation (MNA) was not addressed in the RIFS (§7.1.2, pg 55) and appears to be described only by reference to the Ecology (2005) guidance document in the DCAP (Attachment E, CMP §5.1.3). Please provide additional details on the proposed MNA assessment process.

RESPONSE: Evaluation of MNA is proposed during post remediation confirmational monitoring. Details are presented in the Compliance Monitoring Plan Table 1 and the referenced Ecology document on MNA evaluations (Ecology 2005, Publication No. 05-09-091). Table 1 of the Compliance Monitoring Plan lists the wells involved in the MNA evaluation, the sampling frequency, and the MNA parameters that will be analyzed.

21. **RESPONSE:** The Port of Seattle is missing a comment enumerated as 21.

22. The DCAP does not appear to have specified a feasible plan for groundwater monitoring north of South 160th Street.

RESPONSE: In the Draft CAP, compliance groundwater monitoring is proposed north of South 160th Street by monitoring MW-X (or the additional Port of Seattle Port MW-B well), MW-22, and MW-15. Compliance monitoring will replace well MW-X with the newly installed Port MW-B well. If well MW-X becomes required to install, it will replace compliance monitoring of Port MW-B well.

The newly installed Port MW-A monitoring well will be monitored after the remedial system is turned off for confirmational monitoring. If the results are below MTCA Cleanup Levels, Port MW-A well will not be sampled again.

The changes in groundwater concentrations with time from these compliance monitoring wells will provide adequate indication of MNA and plume strengths in the Qva aquifer north of South 160th Street.

23. The CMP lists contaminants and geochemical parameters (DCAP, Attachment E, CMP Table 1 footnotes) and sampling parameters (DCAP, Attachment E, CMP §6.2.2) for MNA. Redox (Eh) and dissolved oxygen (DO) are commonly measured sampling parameters that should be included.

RESPONSE: If Eh (indicator of REDOX conditions) was left out of the field parameters, we will include this measurement. Dissolved oxygen (DO) is included as a natural attenuation parameter in the Table 1 footnotes of the Compliance Monitoring Plan. The REDOX condition, even without Eh field measurements, will be understood from DO field measurements and the laboratory results for valance specific analytes proposed for MNA evaluations.

24. Does the proposed remediation Alternative A provide for effective capture of vapors generated by air sparging? The air sparging will occur at about 50 feet below ground surface and 10 to 20 below the till layer, where present. How will the combination of extraction wells and trenching work given these two features may be separated by a till layer? Can lateral migration of vapors occur such that vapors bypass the capture zone?

RESPONSE: We believe that the trenches in the locations proposed will be effective in capturing the soil vapors as long as the till layer is not present. The presence of till will be evaluated during the installation of air sparing wells. If till is encountered, then soil gas extraction wells that extend below the till can be employed. The trenches are proposed in areas covered by asphalt, which should provide a barrier to atmospheric intrusion. The area not completely covered by asphalt is the MasterPark Lot C western property boundary that will use soil

vapor extraction wells just above the groundwater table. As mentioned in earlier responses, the northwest area of MasterPark Lot C being subjected to air-sparging and soil vapor extraction did not observe a till layer in the subsurface geology during borehole drilling.

25. At what depth in the regional aquifer will the sparging wells be completed? See Item 15 above regarding vertical migration of contaminants deeper into the water table.

RESPONSE: We are planning on setting the air-sparging wells at a depth of 15 feet below the low groundwater table. Specifications for the remediation system will be detailed in the Engineering Design Report.

26. What depths are proposed for the extraction wells and trenching?

RESPONSE: The soil vapor extraction wells along the western property boundary are planned to be 40 to 45 feet in depth (5 to 10 feet above the water table) at the well bottom. The soil vapor extraction trenches are anticipated to be five to ten feet deep. Specifications for the remediation system will be detailed in the Engineering Design Report.

27. Does the proposed plan adequately provide for monitored natural attenuation of off-site plumes, especially for the Port property north of South 160th Street? See related comments above under *Groundwater Monitoring* and *Contaminant Plumes in the Regional Qva Aquifer*.

RESPONSE: This comment was addressed in our response to Port of Seattle Comment Nos. 9, 20, 22, and 23.

28. In the discussion of remediation alternatives, it would be helpful if scores, weighting values, and alternatives B1 and B2 were included in the RIFS §8 subsections. The list in RIFS §8.3.4 appears to have Alternatives B and E reversed.

RESPONSE: Table 8-7 in the RI/FS and Table 1 of the Draft CAP provide the remedial alternative scores and weighting factors. The table also presents the overall evaluation ranking for the remedial alternatives. The listed remedial alternatives in the RI/FS within Section 8.3.4 do not have Alternatives B and E reversed. The list is the same relative order that was used in Table 8-7 for scoring and ranking the remedial alternatives.

29. A pre-design evaluation does not appear to have been performed to estimate radius of influence of the sparging or extraction wells. A radius of influence for air injection wells was assumed to be 25 feet (50-foot well separation).

RESPONSE: We have planned for a pre-design test for evaluating the radius of influence for air-sparging. However, conducting such tests may have limited value because of local heterogeneity and variability of results. We are currently evaluating whether instead of conducting the pre-design test, the funds for the pre-design test could be used to instead install the air-sparging well system with a closer radius.

3.0 POINTS FOR CLARIFICATION

During the June 27, 2011 meeting with Ecology and the Port of Seattle, several points of clarification were suggested by the Port of Seattle's consultant. The points of clarification are as follows:

- **Add the new Port of Seattle property wells to the Compliance Monitoring Plan.**

  During the June 27, 2011 meeting among the Port of Seattle, Ecology and PLP Group representatives, the decision was made to install two new monitoring wells north of South 160th Street. The new wells will be included on all future maps depicting the site (see the attached Figure 4). The monitoring well, designated as Port MW-B, is within the S. 160th Street right-of-way and will be monitored in accordance with the Compliance Monitoring Plan as a replacement for well MW-X, unless well MW-X is required to be installed. Furthermore, the well, designated MW-X in the Draft CAP, does not need to be installed based on the preliminary analytical results of groundwater from Port-MW-B monitoring well. As such, the new well Port MW-B will be sampled during performance monitoring events (quarterly for year 1 and semi-annually for years 2 through the end of IAS/SVE operation) and during confirmational monitoring events (quarterly for year 1 and semi-annually for years 2 through the closure of the site). The new Port MW-B well will also be sampled for natural attenuation parameters quarterly during the first year of confirmational monitoring (unless it is eventually replaced with a new well MW-X).

  The new well, Port MW-A, is within the Port of Seattle property north of S. 160th Street and may be sampled after the remedial system is turned off for confirmation. If monitoring for Port MW-A has groundwater petroleum fuel-related analytes below MTCA Cleanup Levels, Port MW-A will not be further sampled.

- **Port of Seattle Property vapor intrusion potential.**

  Based upon the sampling results of groundwater from monitoring wells Port MW-A and Port MW-B, the VOC concentrations in groundwater are too low to be a threat to human health in a commercial building from vapor intrusion on the Port of Seattle property. Groundwater concentrations from these two new wells are below screening levels in Ecology's draft guidance document for Vapor Intrusion (Ecology, 2009). This evaluation provides a conservative estimate that vapor intrusion into commercial buildings is not a potential threat given the existing groundwater concentrations and the depth of groundwater.

4.0 DOCUMENTS REFERENCED

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FIGURES

LEGEND:

MW-5	QVA AQUIFER MONITORING WELL LOCATIONS
MW-2	MONITORING WELLS SCREENED IN PERCHED AQUIFER
PORT MW-1	PORT OF SEATTLE (QVA) MONITORING WELLS (ABANDONED)
TACO TIME D	TACO TIME (QVA) MONITORING WELL (ABANDONED)
	TILL LAYER PRESENT

0 100 200

SCALE IN FEET

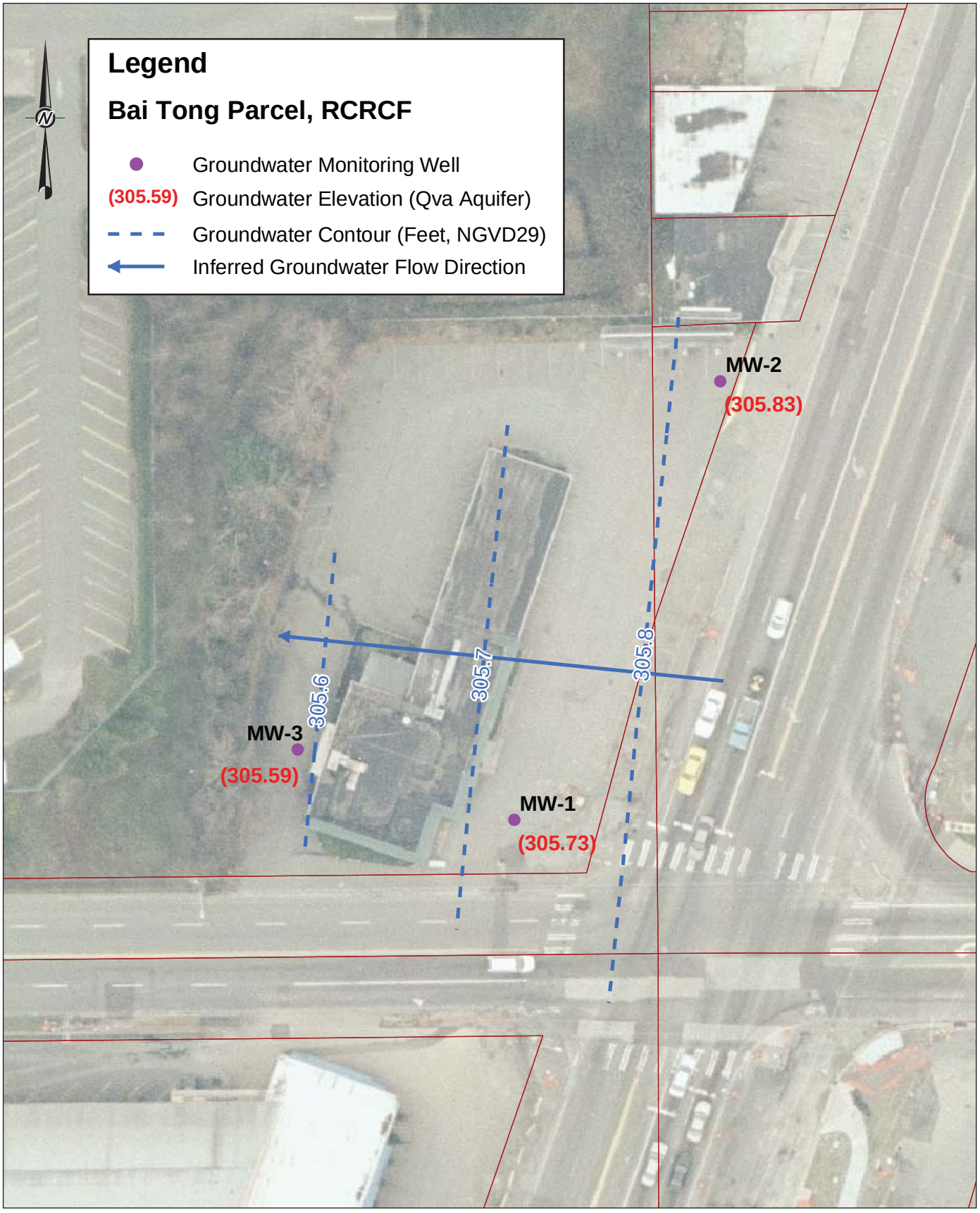
FIGURE **1**

TILL LAYER OBSERVED IN BOREHOLES

SEATAC DEVELOPMENT SITE/RI/FS/WA

K:\CAD\Projects\2007\07393368\05\04\CAP - Addendum\073_93368_05_04_F01_r1.dwg | Fig 1 | Mod: 10/12/2011, 09:14 | Plotted: 10/12/2011, 09:14 | SSimmons

Golder Associates



0 50

APPROXIMATE SCALE IN FEET

FIGURE **2**

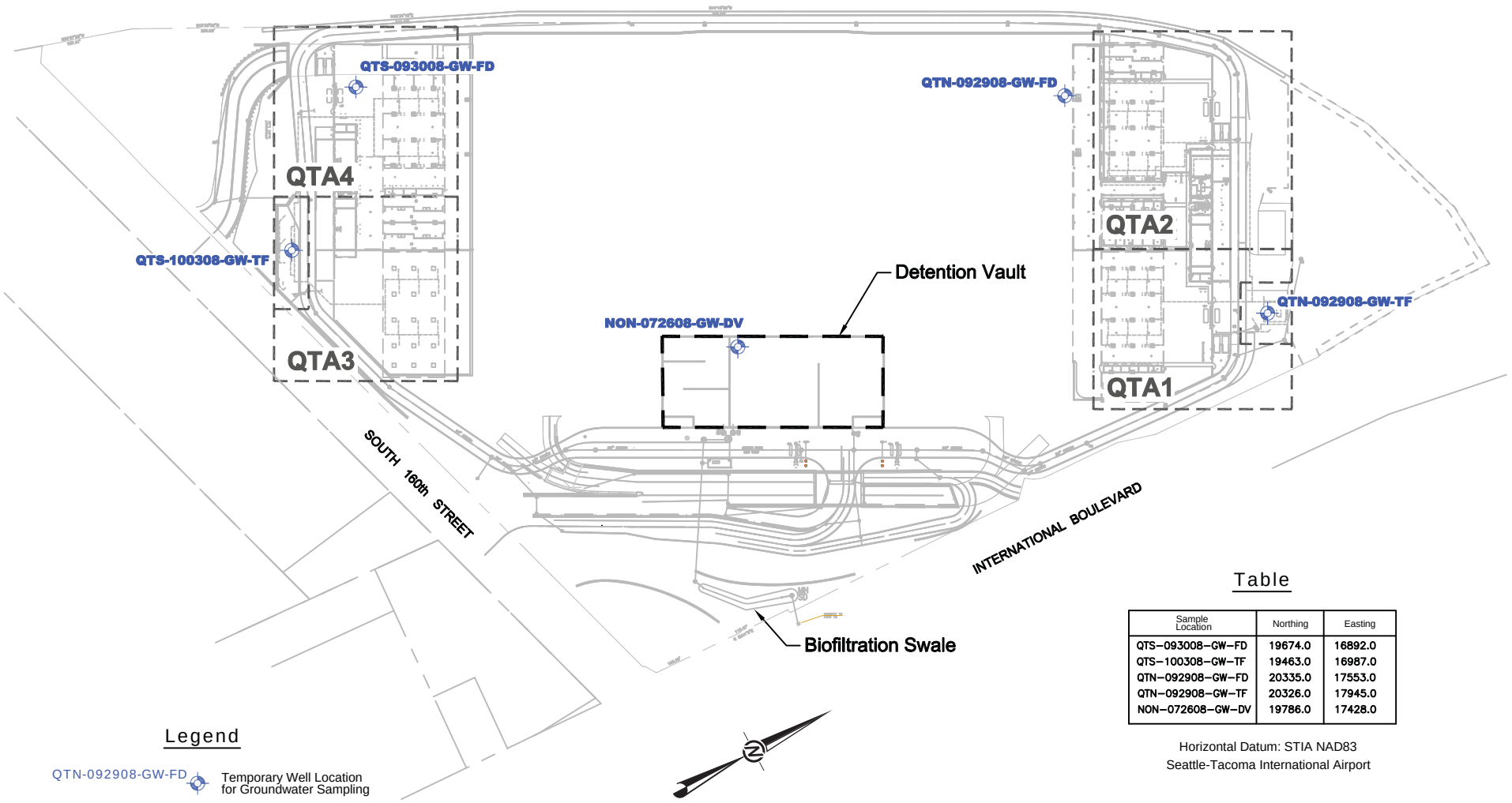
GROUNDWATER FLOW DIRECTION ON THE PORT OF SEATTLE PROPERTY IN 2004

RW/MASTERPARK LOT C RI/FS &REMED/WA

Source: EMS, May 2004

07393368005004fig02.ai | Mod: 08/10/11 | AMP

Golder Associates



Table

Sample Location	Northing	Easting
QTS-093008-GW-FD	19674.0	16892.0
QTS-100308-GW-TF	19463.0	16987.0
QTN-092908-GW-FD	20335.0	17553.0
QTN-092908-GW-TF	20326.0	17945.0
NON-072608-GW-DV	19786.0	17428.0

Horizontal Datum: STIA NAD83
Seattle-Tacoma International Airport

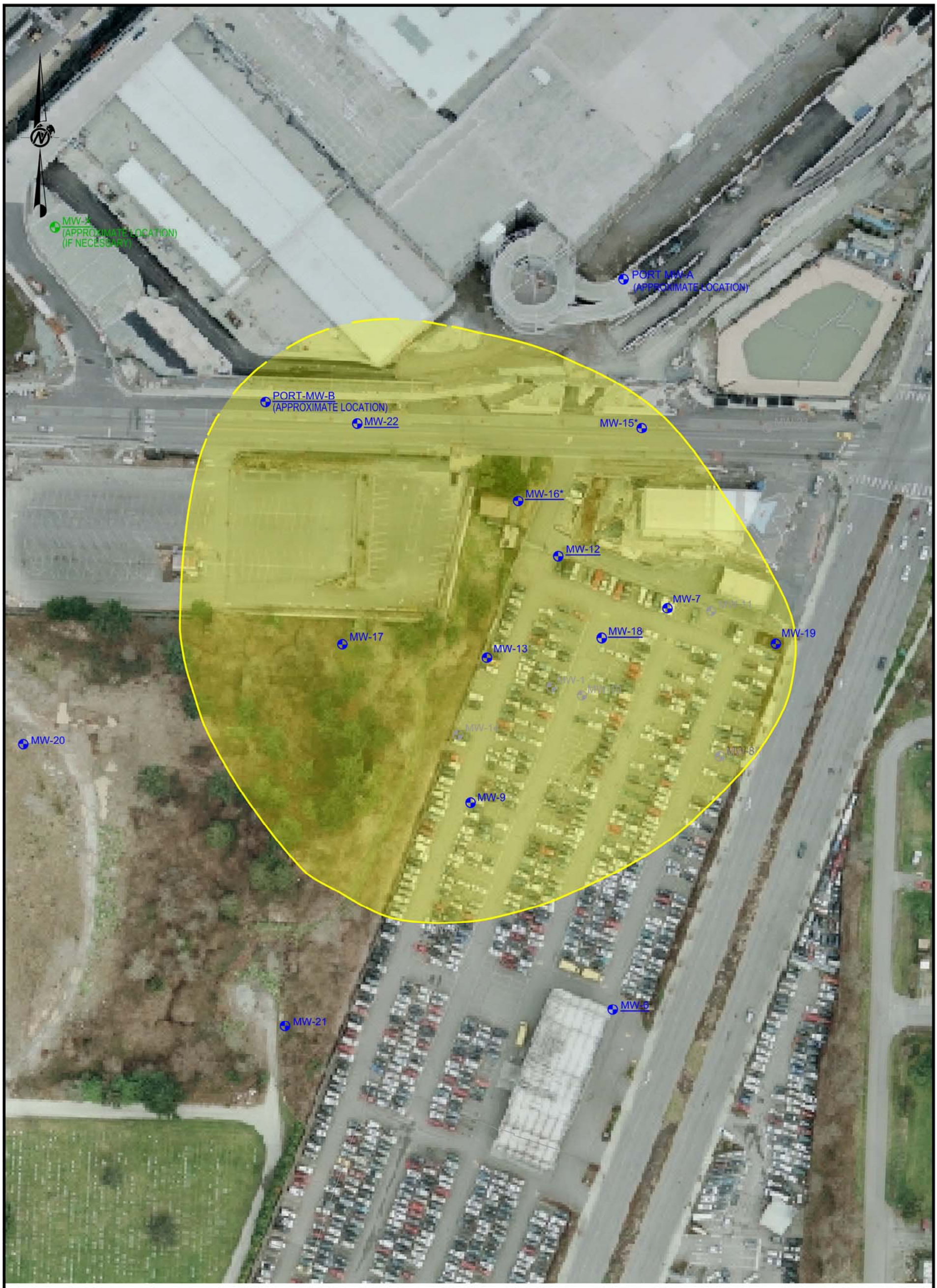
Source: Aspect Consulting, June 2011

FIGURE **3**

GROUNDWATER SAMPLING LOCATIONS AT THE PORT OF SEATTLE PROPERTY IN 2008

RW/MASTERPARK LOT C RI/FS &REMED/WA

Golder Associates



LEGEND:

- MW-17 — COMPLIANCE MONITORING WELLS
- MW-6 — NATURAL ATTENTION WELL
- MW-XX — WELL ONLY INSTALLED IF DEEMED NECESSARY. IF INSTALLED, MONITORING WILL REPLACE PORT-XX.
- APPROXIMATE GW PLUME BOUNDARY

0 100 200

SCALE IN FEET

NOTE:

1. PLUME BOUNDARY BASED ON GROUNDWATER SAMPLE RESULTS EXCEEDING MTCA METHOD A CLEAN UP LEVELS FOR GASOLINE RANGE PETROLEUM HYDROCRABONS (800 UG/L)
2. * = ONLY WELLS THAT ARE NOT PERFORMANCE MONITORING WELLS

FIGURE **4**

LOCATION OF COMPLIANCE MONITORING WELLS

SEATAC DEVELOPMENT SITE/RI/FS/WA

K:\CAD\Projects\2007\07393368\05\04\CAP - Addendum\073-93368-05_04_F04_r2.dwg | F04 | Mod: 10/12/2011, 09:16 | Plotted: 10/12/2011, 09:25 | SSimmons

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APPENDIX A
WELL INSTALLATION LOGS
(MW A and MW B)

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-A	1 of 3

Project Name: STIA Rental Car Facility
Location: Sea-Tac, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger, 300-lb Jars
Sampling Method: D&M

Ground Surface Elev:
Top of Casing Elev.:
Depth to Water (ft BGS): 53.88
Start/Finish Date: 8/3/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1	8" Flush-mount monument set in concrete					Asphalt	Asphalt	
2							Very dense, slightly moist, brown to gray, silty, gravelly, SAND (SM); fine to medium sand	1
3	Concrete							2
4								3
5								4
6		S1		0.1	29, 35, 40			5
7								6
8			NWTPH-Gx, NWTPH-Dx, Vocs, PAHs, RCRA 8 Metals, PCB					7
9		S2		0.1	42, 50		Very gravelly	8
10								9
11								10
12								11
13								12
14								13
15	19 50-lb bags of hydrated Cetco bentonite chips	S3		0.1	46, 50			14
16								15
17								16
18								17
19								18
20		S4		0.2	50			19
21								20
22								21
23								22
24								23
25	2" SCH 40 PVC Casing	S5		0.2	43, 50		Very dense, slightly moist, brown to gray SAND (SP); trace silt, fine to medium sand	24
26								25
27								26
28								27
29								28
								29

Sampler Type:
- No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
- Static Water Level
- Water Level (ATD)

Logged by: MAR
Approved by: RRH
Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-A	2 of 3

Project Name:	STIA Rental Car Facility	Ground Surface Elev	
Location:	Sea-Tac, WA	Top of Casing Elev.	
Driller/Method:	Cascade Drilling / Hollow Stem Auger, 300-lb Jars	Depth to Water (ft BGS)	53.88
Sampling Method:	D&M	Start/Finish Date	8/3/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
31		S6		0.0	36 50			31
32								32
33								33
34								34
35	Hydrated bentonite chips	S7		0.0	37 50		Gravelly	35
36								36
37								37
38								38
39								39
40		S8		0.2	26 30 35		Slightly gravelly	40
41								41
42	12 50-lb bags of #2/12 Monterey Sand filter pack							42
43								43
44								44
45		S9		0.3	32 38 45		Trace gravel	45
46								46
47								47
48								48
49								49
50	2" SCH 40 PVC 10-slot screen	S10		0.2	42 32 37		Trace silt	50
51								51
52								52
53								53
54	▼						Wet	54
55								55
56		S11		0.0	23 28 34			56
57								57
58								58
59								59

Sampler Type:

- ○ No Recovery
- ◧ 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector

- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MAR

Approved by: RRH

Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-A	3 of 3

Project Name: STIA Rental Car Facility
Location: Sea-Tac, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger, 300-lb Jars
Sampling Method: D&M

Ground Surface Elev:
Top of Casing Elev.:
Depth to Water (ft BGS): 53.88
Start/Finish Date: 8/3/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
61		S12		0.3	20 23 27			61
62								62
63								63
64	Threaded PVC Endcap							64
65	Sluff	S13		0.5	16 23 27		Silt lamina at 65'	65
66							Bottom of Boring at 65.5' BGS	66
67								67
68								68
69								69
70								70
71								71
72								72
73								73
74								74
75								75
76								76
77								77
78								78
79								79
80								80
81								81
82								82
83								83
84								84
85								85
86								86
87								87
88								88
89								89

Sampler Type:
- ○ No Recovery
- ◧ 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MAR
Approved by: RRH
Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-B	1 of 4

Project Name:	STIA Rental Car Facility	Ground Surface Elev	
Location:	Sea-Tac, WA	Top of Casing Elev.	
Driller/Method:	Cascade Drilling / Hollow Stem Auger, 300-lb Jars	Depth to Water (ft BGS)	84.33
Sampling Method:	D&M	Start/Finish Date	8/2/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
1	8" Flush-mount monument set in concrete					Asphalt	Asphalt	
2						Very dense, slightly moist, brown, gravelly, silty SAND (SM); fine to medium sand	Very dense, slightly moist, brown, gravelly, silty SAND (SM); fine to medium sand	1
3	Concrete							2
4								3
5		S1		0.3	50/6			4
6								5
7								6
8								7
9		S2	NWTPH-Gx, NWTPH-Dx, Vocs, PAHs, RCRA 8 Metals, PCB		42 50	Very dense, slightly moist, brown, slightly gravelly, slightly silty SAND (SP); fine to medium sand	Very dense, slightly moist, brown, slightly gravelly, slightly silty SAND (SP); fine to medium sand	8
10								9
11								10
12								11
13								12
14								13
15	40 50-lb bags of hydrated Cetco bentonite chips	S3		0.1	43 50			14
16						Very dense, slightly moist, brown, silty, very gravelly SAND (SM); fine to medium sand	Very dense, slightly moist, brown, silty, very gravelly SAND (SM); fine to medium sand	15
17								16
18								17
19								18
20		S4		0.3	34 36 40			19
21						Very dense, slightly moist, brown, slightly gravelly SAND (SP); fine to medium sand	Very dense, slightly moist, brown, slightly gravelly SAND (SP); fine to medium sand	20
22								21
23								22
24								23
25		S5		0.4	15 28 30	Brown-gray; trace gravel	Brown-gray; trace gravel	24
26								25
27								26
28								27
29								28
								29

Sampler Type:

- ○ No Recovery
- ◧ 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector

- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MAR

Approved by: RRH

Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-B	2 of 4

Project Name:	STIA Rental Car Facility	Ground Surface Elev	
Location:	Sea-Tac, WA	Top of Casing Elev.	
Driller/Method:	Cascade Drilling / Hollow Stem Auger, 300-lb Jars	Depth to Water (ft BGS)	84.33
Sampling Method:	D&M	Start/Finish Date	8/2/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
31		S6		0.4	15 27 31			31
32								32
33								33
34								34
35		S7		0.4	16 27 31			35
36								36
37								37
38								38
39								39
40	2" SCH 40 PVC Casing	S8		0.5	18 23 31			40
41								41
42								42
43								43
44								44
45		S9		0.4	28 35 40			45
46								46
47								47
48								48
49								49
50	Hydrated bentonite chips	S10		0.4	35 50		No gravel	50
51								51
52								52
53								53
54								54
55		S11			31 50			55
56								56
57								57
58								58
59								59

Sampler Type:

- ○ No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector

- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MAR

Approved by: RRH

Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-B	3 of 4

Project Name:	STIA Rental Car Facility	Ground Surface Elev	
Location:	Sea-Tac, WA	Top of Casing Elev.	
Driller/Method:	Cascade Drilling / Hollow Stem Auger, 300-lb Jars	Depth to Water (ft BGS)	84.33
Sampling Method:	D&M	Start/Finish Date	8/2/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
61		S12		0.5	20 35 41		Scattered thin silt lamina	61
62								62
63								63
64								64
65		S13		0.5	24 34 39		Trace gravel	65
66								66
67								67
68								68
69								69
70		S14		0.4	38 50		Slightly gravelly	70
71								71
72								72
73								73
74								74
75		S15		0.4	32 50			75
76								76
77	12 50-lb bags of #2/12 Monterey Sand filter pack							77
78								78
79								79
80		S16			48 50/4			80
81								81
82								82
83								83
84	▼							84
85		S17		0.4	46 50/4			85
86	2" SCH 40 PVC 10-slot screen							86
87								87
88								88
89	▽						Wet	89

Sampler Type:

- ○ No Recovery
- ◧ 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector

- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MAR

Approved by: RRH

Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
090134	MW-B	4 of 4

Project Name: STIA Rental Car Facility
Location: Sea-Tac, WA
Driller/Method: Cascade Drilling / Hollow Stem Auger, 300-lb Jars
Sampling Method: D&M

Ground Surface Elev:
Top of Casing Elev.:
Depth to Water (ft BGS): 84.33
Start/Finish Date: 8/2/2011

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
91		S18		0.4	30 35 41			91
92								92
93								93
94								94
95		S19			12 15 18			95
96								96
97								97
98								98
99	Threaded PVC Endcap Sluff							99
100		S20		5.5	12 17 19		Trace gravel	100
101								101
102							Bottom of boring at 101.5' BGS	102
103								103
104								104
105								105
106								106
107								107
108								108
109								109
110								110
111								111
112								112
113								113
114								114
115								115
116								116
117								117
118								118
119								119

Sampler Type:
- ○ No Recovery
- 3.25" OD D&M Split-Spoon Ring Sampler

PID - Photoionization Detector
- ▼ Static Water Level
- ▽ Water Level (ATD)

Logged by: MAR
Approved by: RRH
Figure No. B -

_MONITORING WELL_STIA CAR RENTAL FACILITY.GPJ August 24, 2011

APPENDIX B
PORT MW-A and PORT MW-B GROUNDWATER ANALYTICAL RESULTS

Table B-1: Rental Car Facility
August 2011 Groundwater Data from New Well Locations

Chemical Name	Ground Water, Method A, Table Value (µg/L)		Ground Water, Method B, Most Restrictive Standard Formula Value (µg/L)		MW-A 08/04/11		MW-B 08/03/11	
Total Petroleum Hydrocarbons								
Gasoline Range Hydrocarbons in ug/l	800				50	U	200	
Diesel Range Hydrocarbons in ug/l	500				50	U	280	
Residual Range Organics in ug/l					250	U	250	U
Metals								
Dissolved Arsenic in ug/l	5		0.058		1	U	1	U
Dissolved Barium in ug/l			3,200		43.9		43.7	
Dissolved Cadmium in ug/l	5		8		1	U	1	U
Dissolved Chromium in ug/l	50				1.51		1	U
Dissolved Lead in ug/l	15				1	U	1	U
Dissolved Mercury in ug/l	2		4.8		0.1	U	0.1	U
Dissolved Selenium in ug/l			80		1.82		1.21	
Dissolved Silver in ug/l			80		1	U	1	U
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene in ug/l			960		0.1	U	0.1	U
Acenaphthylene in ug/l					0.1	U	0.1	U
Anthracene in ug/l			4,800		0.1	U	0.1	U
Benzo(g,h,i)perylene in ug/l					0.1	U	0.1	U
Fluoranthene in ug/l			640		0.1	U	0.1	U
Fluorene in ug/l			640		0.1	U	0.1	U
Phenanthrene in ug/l					0.1	U	0.1	U
Pyrene in ug/l			480		0.1	U	0.1	U
Naphthalene in ug/l	160		160		0.05	U	12	
Benz(a)anthracene in ug/l					0.1	U	0.1	U
Benzo(a)pyrene in ug/l	0.1		0.012		0.1	U	0.1	U
Benzo(b)fluoranthene in ug/l					0.1	U	0.1	U
Benzo(k)fluoranthene in ug/l					0.1	U	0.1	U
Chrysene in ug/l					0.1	U	0.1	U
Dibenzo(a,h)anthracene in ug/l					0.1	U	0.1	U
Indeno(1,2,3-cd)pyrene in ug/l					0.1	U	0.1	U
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane in ug/l			1.7		1	U	1	U
1,1,1-Trichloroethane in ug/l	200		16,000		1	U	1	U
1,1,2,2-Tetrachloroethane in ug/l			0.22		1	U	1	U
1,1,2-Trichloroethane in ug/l			0.77		1	U	1	U
1,1-Dichloroethane in ug/l			1,600		1	U	1	U
1,1-Dichloroethene in ug/l			400		1	U	1	U
1,1-Dichloropropene in ug/l					1	U	1	U
1,2,3-Trichlorobenzene in ug/l					1	U	1	U
1,2,3-Trichloropropane in ug/l			0.0063		1	U	1	U
1,2,4-Trichlorobenzene in ug/l			80		1	U	1	U
1,2,4-Trimethylbenzene in ug/l			400		1	U	1	U
1,2-Dibromo-3-chloropropane in ug/l			0.031		10	U	10	U
1,2-Dibromoethane (EDB) in ug/l	0.01		0.022		1	U	1	U
1,2-Dichlorobenzene in ug/l			720		1	U	1	U
1,2-Dichloroethane (EDC) in ug/l	5		0.48		1	U	1	U
1,2-Dichloropropane in ug/l			0.64		1	U	1	U
1,3,5-Trimethylbenzene in ug/l			400		1	U	4.4	

Golder Associates

Table B-1: Rental Car Facility
August 2011 Groundwater Data from New Well Locations

Chemical Name	Ground Water, Method A, Table Value (µg/L)		Ground Water, Method B, Most Restrictive Standard Formula Value (µg/L)		MW-A 08/04/11		MW-B 08/03/11	
1,3-Dichlorobenzene in ug/l					1	U	1	U
1,3-Dichloropropane in ug/l					1	U	1	U
1,4-Dichlorobenzene in ug/l			1.8		1	U	1	U
2,2-Dichloropropane in ug/l					1	U	1	U
2-Butanone in ug/l			4,800		10	U	10	U
2-Chlorotoluene in ug/l			160		1	U	1	U
2-Hexanone in ug/l					10	U	10	U
4-Chlorotoluene in ug/l					1	U	1	U
4-Methyl-2-pentanone in ug/l			640		10	U	10	U
Acetone in ug/l			800		10	U	10	U
Benzene in ug/l	5		0.8		0.35	U	1.3	*
Bromobenzene in ug/l					1	U	1	U
Bromodichloromethane in ug/l			0.71		1	U	1	U
Bromoform in ug/l			5.5		1	U	1	U
Bromomethane in ug/l			11		1	U	1	U
Carbon tetrachloride in ug/l			0.34		1	U	1	U
Chlorobenzene in ug/l			160		1	U	1	U
Chloroethane in ug/l			15		1	U	1	U
Chloroform in ug/l			7.2		1	U	1	U
Chloromethane in ug/l			3.4		10	U	10	U
cis-1,2-Dichloroethene in ug/l			80		1	U	1	U
cis-1,3-Dichloropropene in ug/l					1	U	1	U
Dibromochloromethane in ug/l			0.52		1	U	1	U
Dibromomethane in ug/l			80		1	U	1	U
Dichlorodifluoromethane in ug/l			1,600		1	U	1	U
Ethylbenzene in ug/l	700		800		1	U	13	
Hexachlorobutadiene in ug/l			0.56		1	U	1	U
Isopropylbenzene in ug/l			800		1	U	1	U
m,p-Xylenes in ug/l					2	U	3.4	
Methyl tert-butyl ether (MTBE) in ug/l	20		24		1	U	1	U
Methylene chloride in ug/l	5		5.8		5	U	5	U
n-Hexane in ug/l			480		1	U	1	U
n-Propylbenzene in ug/l					1	U	1	U
o-Xylene in ug/l			16,000		1	U	1	U
p-Isopropyltoluene in ug/l					1	U	1	U
sec-Butylbenzene in ug/l					1	U	1	U
Styrene in ug/l			1.5		1	U	1	U
tert-Butylbenzene in ug/l					1	U	1	U
Tetrachloroethene (PCE) in ug/l	5		0.081		1	U	1	U
Toluene in ug/l	1,000		640		1	U	1	U
trans-1,2-Dichloroethene in ug/l			160		1	U	1	U
trans-1,3-Dichloropropene in ug/l					1	U	1	U
Trichloroethene (TCE) in ug/l	5		0.49		1	U	1	U
Trichlorofluoromethane in ug/l			2,400		1	U	1	U
Vinyl chloride in ug/l	0.2		0.029		0.2	U	0.2	U
Naphthalene in ug/l	160		160		1	U	13	

Golder Associates

Table B-1: Rental Car Facility
August 2011 Groundwater Data from New Well Locations

Chemical Name	Ground Water, Method A, Table Value (µg/L)		Ground Water, Method B, Most Restrictive Standard Formula Value (µg/L)		MW-A 08/04/11		MW-B 08/03/11	
EDB by 8011								
1,2-Dibromoethane (EDB) in ug/l	0.01		0.022		0.01	U	0.01	U
Polychlorinated Biphenyls (PCBs)								
Aroclor 1016 in ug/l			1.1		0.1	U	0.1	U
Aroclor 1221 in ug/l					0.1	U	0.1	U
Aroclor 1232 in ug/l					0.1	U	0.1	U
Aroclor 1242 in ug/l					0.1	U	0.1	U
Aroclor 1248 in ug/l					0.1	U	0.1	U
Aroclor 1254 in ug/l			0.32		0.1	U	0.1	U
Aroclor 1260 in ug/l					0.1	U	0.1	U

Notes
*MTCA Method A and B for Benzene are both 5 µg/L in accordance with WAC 173-340-705 (5)
U - Analyte was not detected at or above the reported result.
Source : Aspect Consulting 08/24/11