DATA UPDATE AND ON-SITE FEASIBILITY REPORT
SALTESE FLATS WETLAND RESTORATION INVESTIGATION

Spokane County, Washington

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1.0 INTRODUCTION

This document summarizes new data and evaluates feasibility for restoration options at Saltese Flats. Saltese Flats is located in Spokane County southeast of the city of Spokane Valley (**Figure 1-1)**. The area known as Saltese Flats occupies roughly 1,200 acres of land that lies within a watershed of approximately 14,000 acres (**Figure 1-2**). The Flats includes land that functions as wetland today, and also land that historically was a lake/wetland system but has been drained and used for agriculture for over one hundred years. Three wetland restoration options are under evaluation at Saltese Flats (**Figure 1-3**). Option A is 342 acres, Option B is 512 acres and Option C is approximately 1200 acres.

The Saltese Flats Wetland Restoration Investigation has been initiated to evaluate the feasibility of restoring the Flats, or portions thereof, to wetlands. Benefits of the restoration are expected to include an improvement of flow conditions in Saltese Creek and summer lake levels in Shelley Lake, water releases later in the summer to help increase flow in the Spokane River, improved wildlife habitat, educational and recreation opportunities, and a potential location for the beneficial use of reclaimed water.

This document represents the completion of the third phase of the Saltese Flats investigation completed by PBS&J under contract with the Spokane County Division of Utilities (Spokane County Utilities) in coordination with the WRIA 55/57 Watershed Implementation Team (WRIA 55/57 WIT), and with funding from the Washington State Department of Ecology (Ecology). Previous phases include:

1. Development of a *Scope of Work* (PBS&J, 2008a) with subsequent update upon the completion of initial tasks (PBS&J, 2008e);
2. Development of *Goals and Objectives* for the project (PBS&J, 2008b);
3. A public meeting held on October 15, 2008 to introduce the project to interested parties, and a series of meetings with the WRIA 55/57 WIT and a group known as the Wetland Panel, which was formed from a collection of stakeholders for this investigation;
4. Development of a *Quality Assurance Program Plan*, or QAPP (PBS&J, 2008c) and a *Monitoring Program Plan* (PBS&J, 2008d);
5. Completion of an evaluation and summary of existing information, including a preliminary site characterization and documentation in an *Existing Data Review* report (PBS&J, 2009); and
6. Initiation of the Monitoring Program.

1.1 Purpose and Scope

The purpose of this report is to provide a summary of additional data and potential restoration options for Saltese Flats. It describes a screening process used to evaluate these options and identifies alternatives to be used in developing detailed conceptual designs. Specifically, this phase of the project included the following tasks which are further described in this document:

- Presentation of additional data collected under the Monitoring Program, as part of recommendations in the *Existing Data Review* report (PBS&J, 2009), or discovered as work on this investigation has progressed;
- An update of the preliminary site characterization presented in the *Existing Data Review* report;
- A description of the selected restoration scenarios with detail provided on water budgets and management alternatives;
- A screening of the selected restoration alternatives with a description of the screening process, criteria used in the screening, and a summary of where each of the alternatives rank;
- Selection of preferred restoration alternatives to be used in developing conceptual designs, and
- A summary and recommendations.

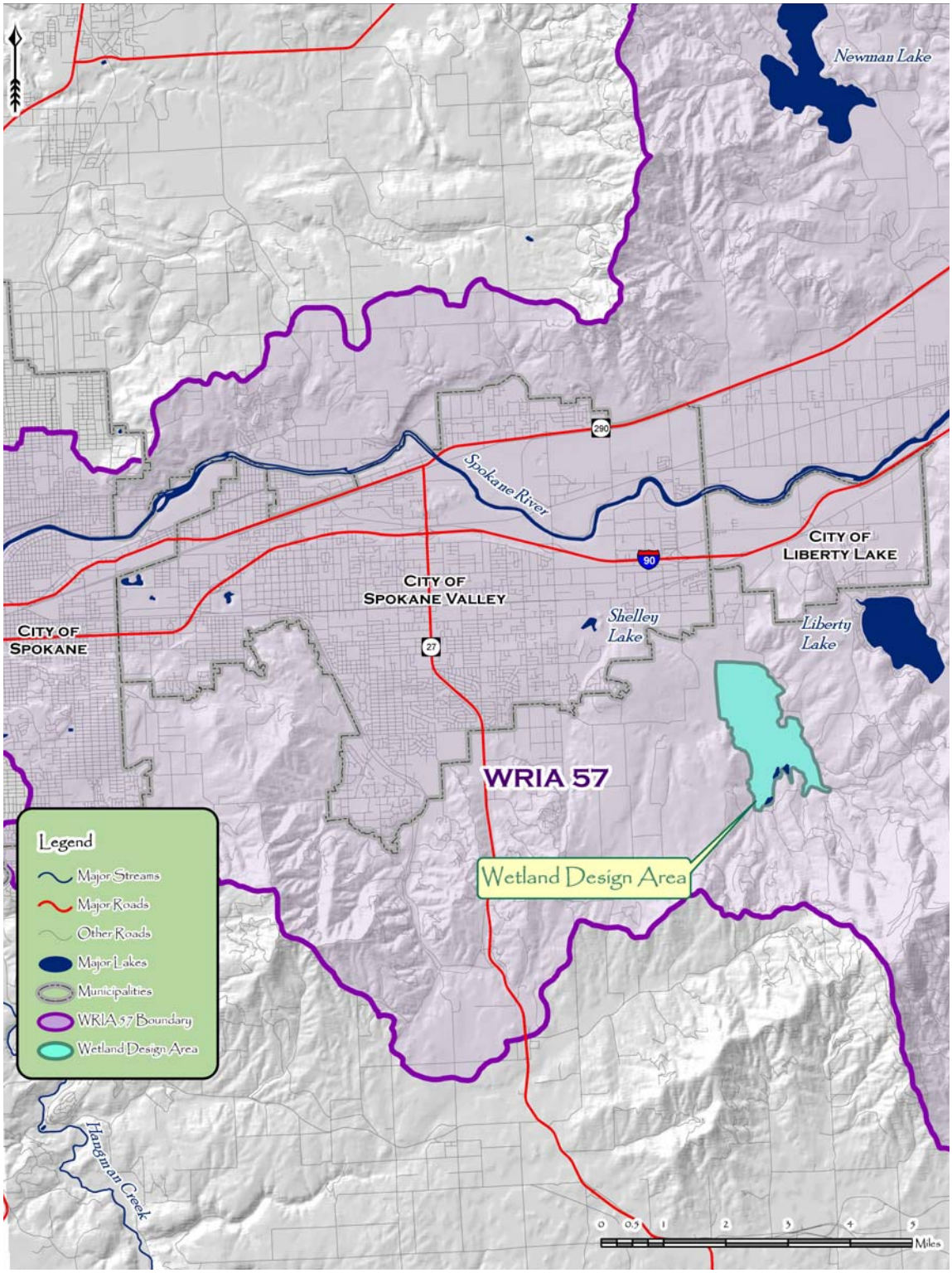


Figure 1-1. Saltese Flats Location

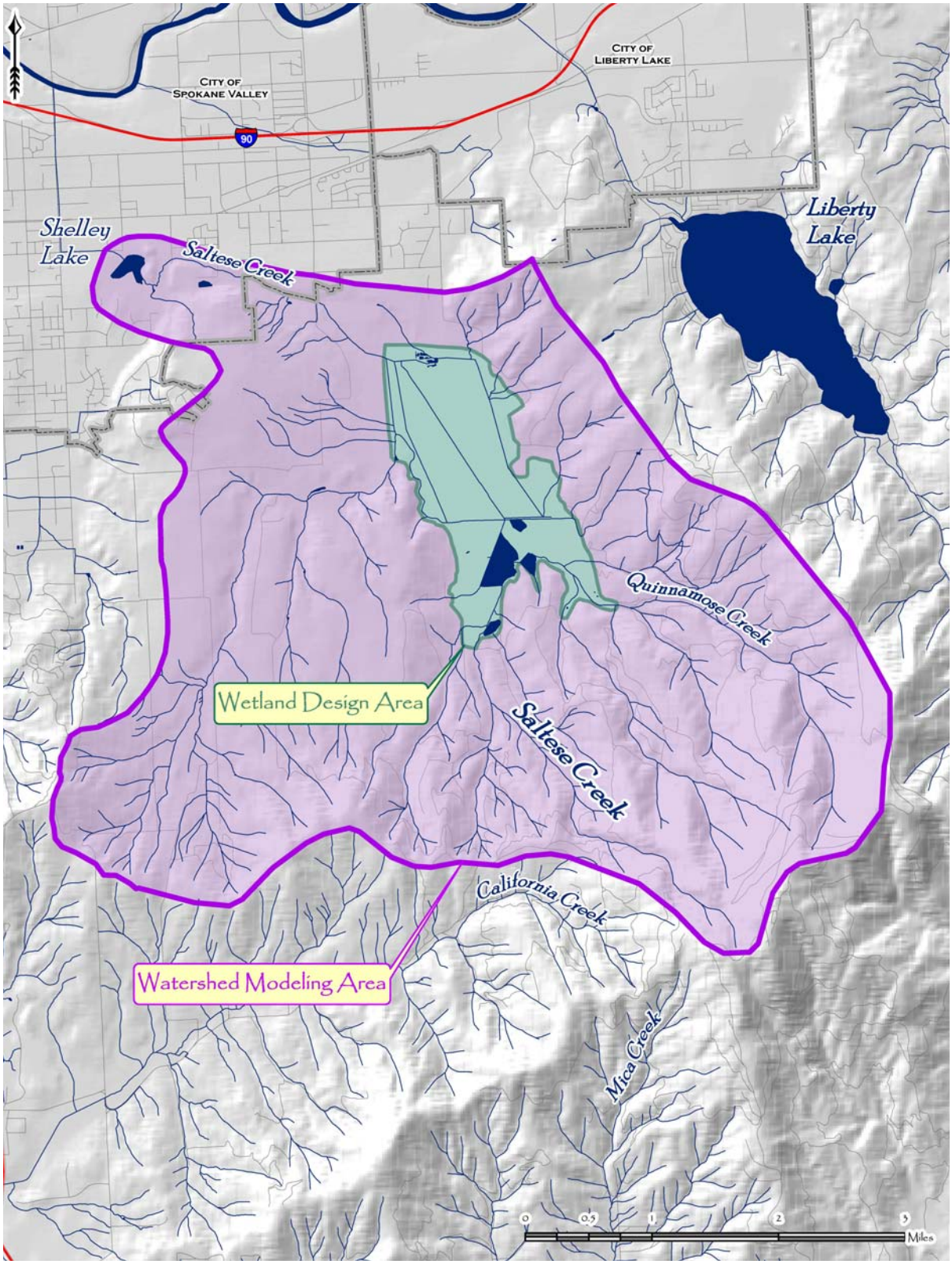


Figure 1-2. Saltese Flats Watershed Delineation

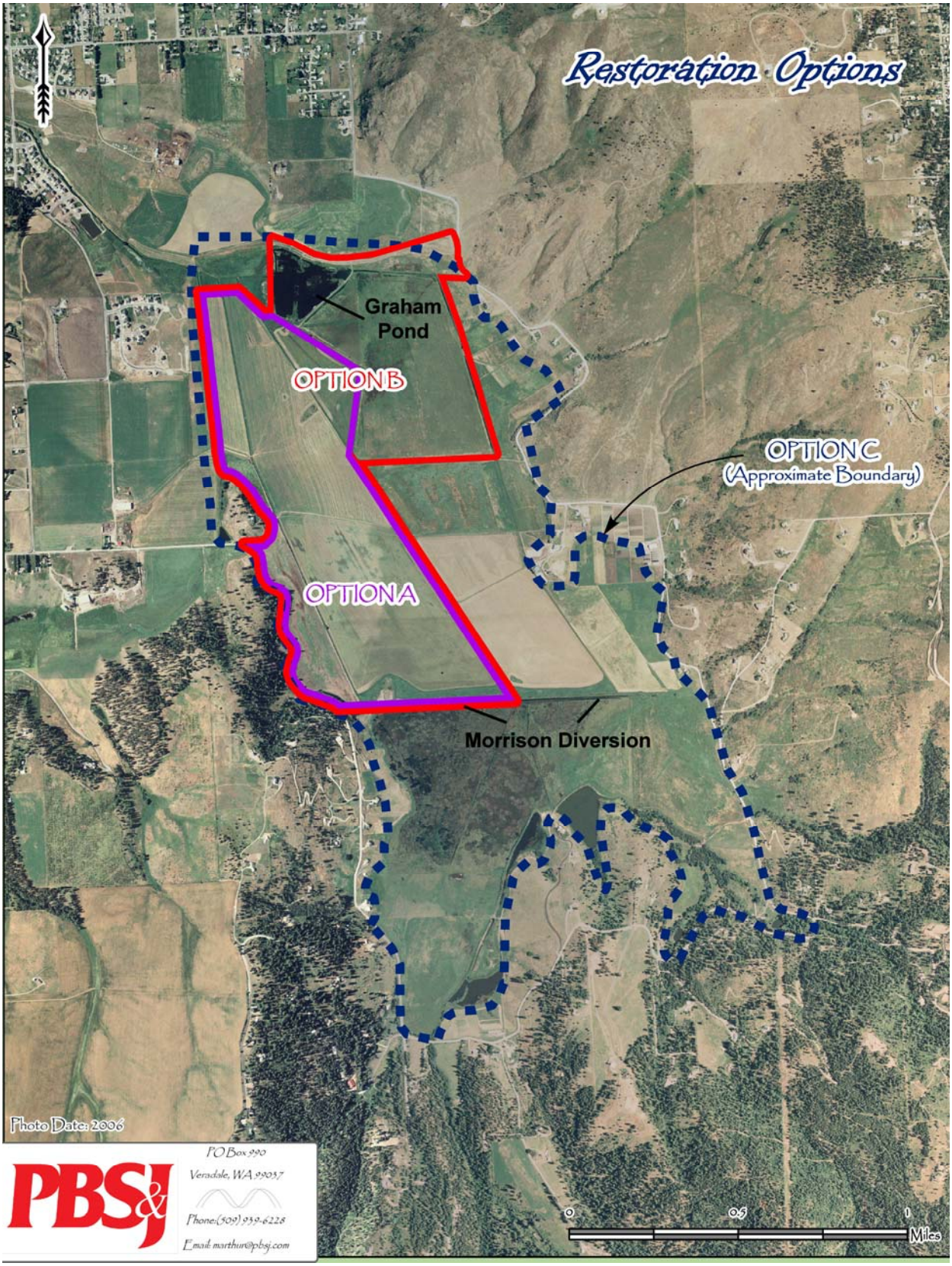


Figure 1-3. Saltese Flats Restoration Options

1.2 Additional Data Sources

As this investigation has proceeded, additional data has been collected to improve the characterization of the site and to facilitate this feasibility study of restoration alternatives. Some of the data have been developed into additional GIS layers or modifications of existing layers, others have been compiled into spreadsheets. Additional data collected for this investigation are summarized in **Section 2** and includes:

- Topographic Survey: Ducks Unlimited survey and Spokane County Utilities survey.
- Photographic Documentation: Photographs from established photo-points taken under various seasonal conditions.
- Meteorological Data: Updates of data from weather stations at Spokane and Coeur d'Alene, and data from stations near Liberty Lake provided by Liberty Lake Sewer and Water District.
- Soil Data: Descriptions from soil boring program, soil sample collection and lab analyses.
- Wetland Delineation: Detailed site survey of wetland conditions.
- Surface Water Data: On-site water level monitoring, discharge measurements, and water quality sampling; Shelley Lake level data from Shelley Lake Homeowners Association; data from Liberty Lake Sewer and Water District for Liberty Lake area.
- Groundwater Data: On-site groundwater level monitoring and water quality sampling; downgradient SVRP aquifer water quality data from Spokane County Utilities.

Note: The horizontal datum used in this report is NAD83 HARN (High Accuracy Reference Network) unless specified differently. The coordinate system is Washington State Plane. The vertical datum used in this report is NAVD88 unless specified differently.

2.0 ADDITIONAL DATA SUMMARY

This section presents a summary of additional data as noted in **Section 1.2**. These data have been used to develop an updated interpretation of site conditions. The data and information gathered are of both a site-specific (Saltese Flats) and regional nature. Due to the large volume of information available, not all of the data gathered are presented in detail. Monitoring program data source locations discussed in this section are shown on **Figure 2-1** and **Figure 2-2**.

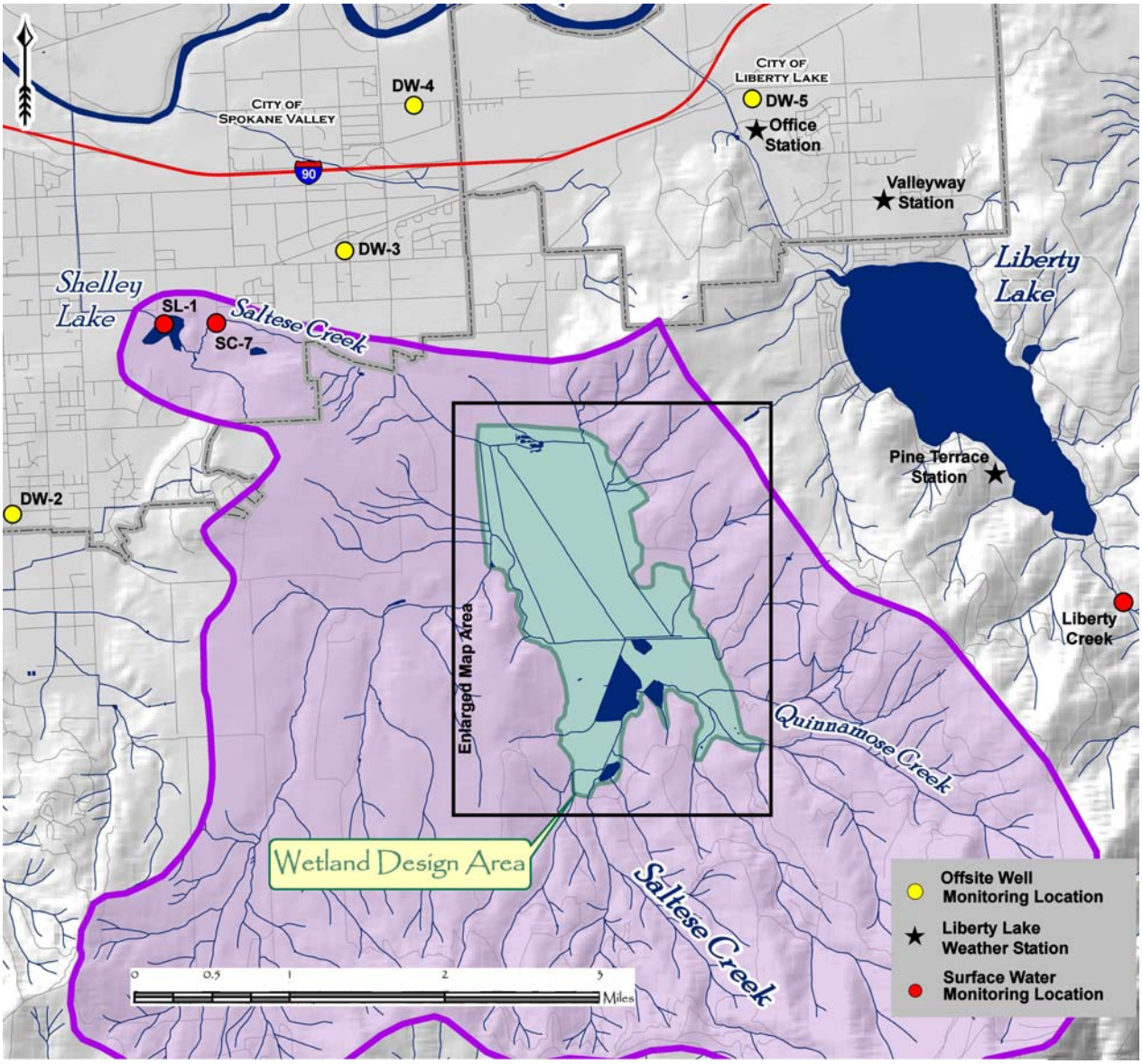


Figure 2-1. Regional Monitoring and Data Source Locations

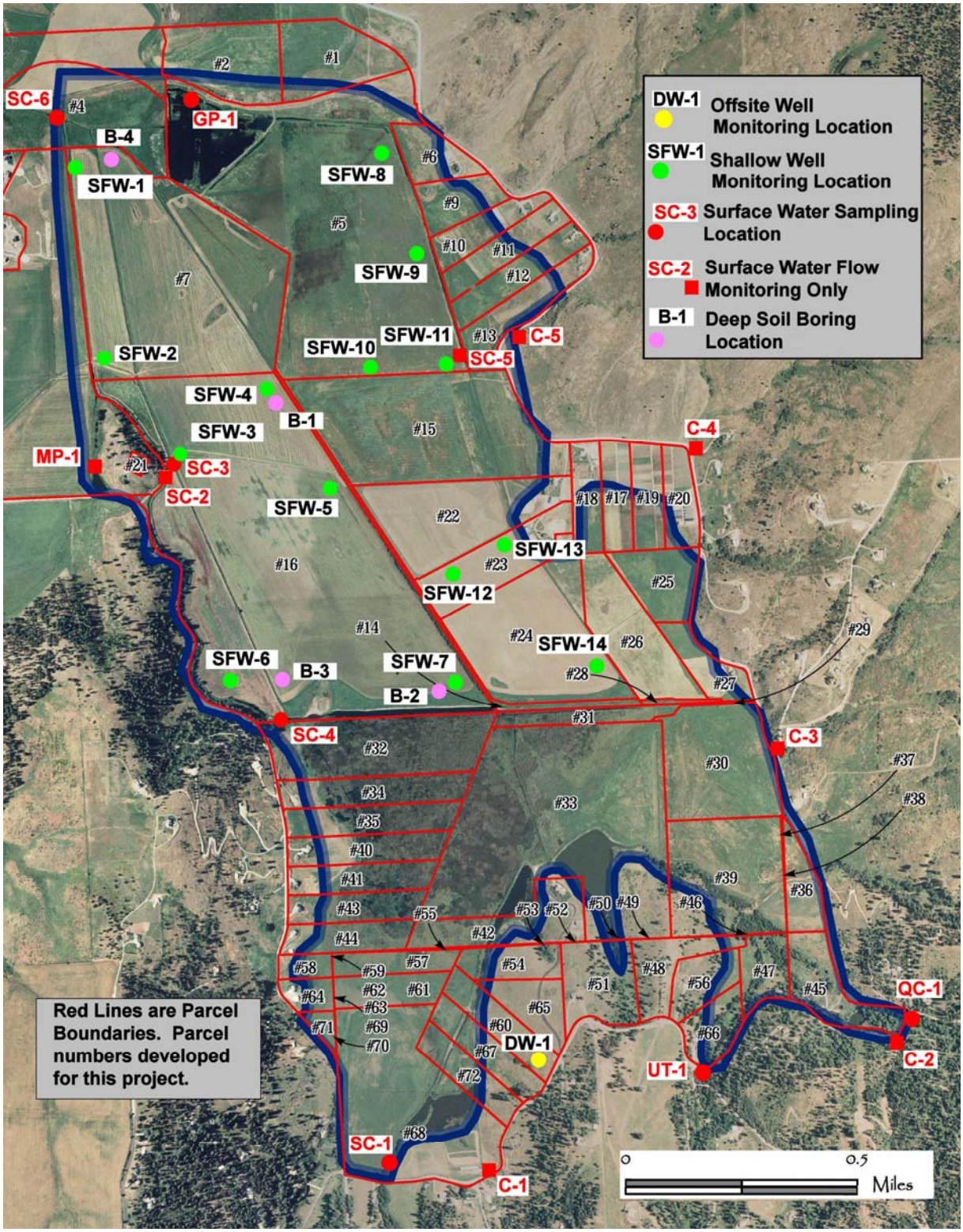


Figure 2-2. Saltese Flats Monitoring and Data Source Locations

2.1 Topographic Surveys

Topographic information available for Saltese Flats identified in the *Existing Data Review* report included primarily USGS topographic data, the resolution of which is limited to 20 feet. It was noted that the minimum resolution to evaluate wetland restoration feasibility at the Flats is 2 feet for the wetland design area and 5 feet for the entire Flats.

Additional topographic information was assembled from two survey efforts at the site. The first was conducted by Ducks Unlimited in 2006 and resulted in a 1 foot contour map for Saltese Flats north of the east-west drain ditch. This effort also covers adjacent uplands east and west of the Flats. This new topographic map is presented as **Figure A-1** in **Appendix A**. It reveals that the lowest portion of the flat is along the northern border and in the northeast portion of the Flats. The topographic survey and additional site investigation also revealed that portions of the northern end of the Flats are lower than the outlet which drains into Saltese Creek. Historically a high-volume, low-head pump was used to discharge water from this area into the Saltese Creek channel. The second survey effort was conducted by Spokane County in the winter of 2009 and the survey determined the location and elevation of shallow monitoring wells, staff gauges and other features of interest. **Figure A-2** in **Appendix A** illustrates the locations and elevations of the shallow monitoring wells in relation to the Ducks Unlimited survey data. These two surveys appear to correlate well. These data will be used for wetland conceptual design in the next phase of this project.

New FEMA floodplain maps were issued this spring for the Saltese Flats area. **Figure A-3** in **Appendix A** illustrates the new floodplain map for the Flats and extending to Shelly Lake. This new map appears to have several flaws with implications for this project. First, the flood elevation indicated for the Flats is 2042 ft MSL which does not correlate at all with the flood boundaries on the map. Usually when the flood boundary on a FEMA map does not correlate with the indicated boundary, the elevation is used as the determining factor. This discrepancy may present challenges during permitting and require additional analysis. The second flaw in the new FEMA map is the omission of the Steen Road gravel pit and overflow channel linking it to Saltese Creek. This omission may have been due to the quality of topographic maps used by FEMA and a lack of ground-verification of surface features in this area. Historic experience has demonstrated the value of the gravel pit for reducing flood impacts at Shelly Lake and this is reinforced by the water budget analysis presented in this report. Without floodplain designation for the pit and channel, it is difficult to prevent development which could compromise these features for flood control. Development activities have already been proposed.

A map showing Shelley Lake, Saltese Creek, and the channel to the gravel pit is presented on **Figure A-4** in **Appendix A**. The map also includes topographic contours from two sources, the DEM contours have a resolution of five feet and cover the majority of the area shown, while contours in the gravel pit and channel from Saltese Creek are from the Spokane County survey completed in the winter of 2009.

The topographic contours shown on **Figure A-4** suggest that Shelley Lake levels could rise to elevations of approximately 2020 ft MSL without impact to existing structures, although the contours at the lake should not be considered precise. Lake level monitoring for the Saltese Flats study have documented lake levels up to 2017 ft MSL (discussed below in **Section 2.6**) with no known adverse impacts. As restoration plans are further developed maximum lake levels will need to be better defined, which may necessitate additional surveying along the lake shore and coordination with local homeowners.

The approximate location of the overflow channel from Saltese Creek to the gravel pit is also shown on **Figure A-4**. The detailed survey along the channel and in the pit provide an accurate view of the topography and have allowed the development of channel cross-sections, shown on **Figure A-5** in **Appendix A**. The nature of the topography at the diversion from Saltese Creek, and along Saltese Creek itself is less precise, relying on the DEM contours. The exact elevation at which water would flow into the channel leading to the gravel pit is not known with great precision, but appears to be between 2020 and 2025ft MSL. Extending the detailed survey to the diversion location and along portions of the Saltese Creek

channel will likely be necessary as design plans move forward and the nature of a control structure at the diversion is evaluated along with any needs for revising the overflow channel.

2.2 Photographic Documentation

A series of photo-points were established around Saltese Flats at locations shown on **Figure 2-3**. Photographs were taken from these locations to illustrate various seasonal conditions in and around the site and to establish baseline conditions prior to restoration activities. A large number of photographs have been taken and some examples of these photographs are included as **Appendix B**. The two photos in **Appendix B** depict views proposed for use in creating visualizations for conceptual designs during the next phase of this project. One photo (**Figure B-1** taken from location 14) is taken from the roadway on the east side of the Flats and one (**Figure B-2** taken from location 16) is from a roadway on the west side of the Flats with a more elevated perspective. A library of photographs will be provided on a CD at the completion of this study.

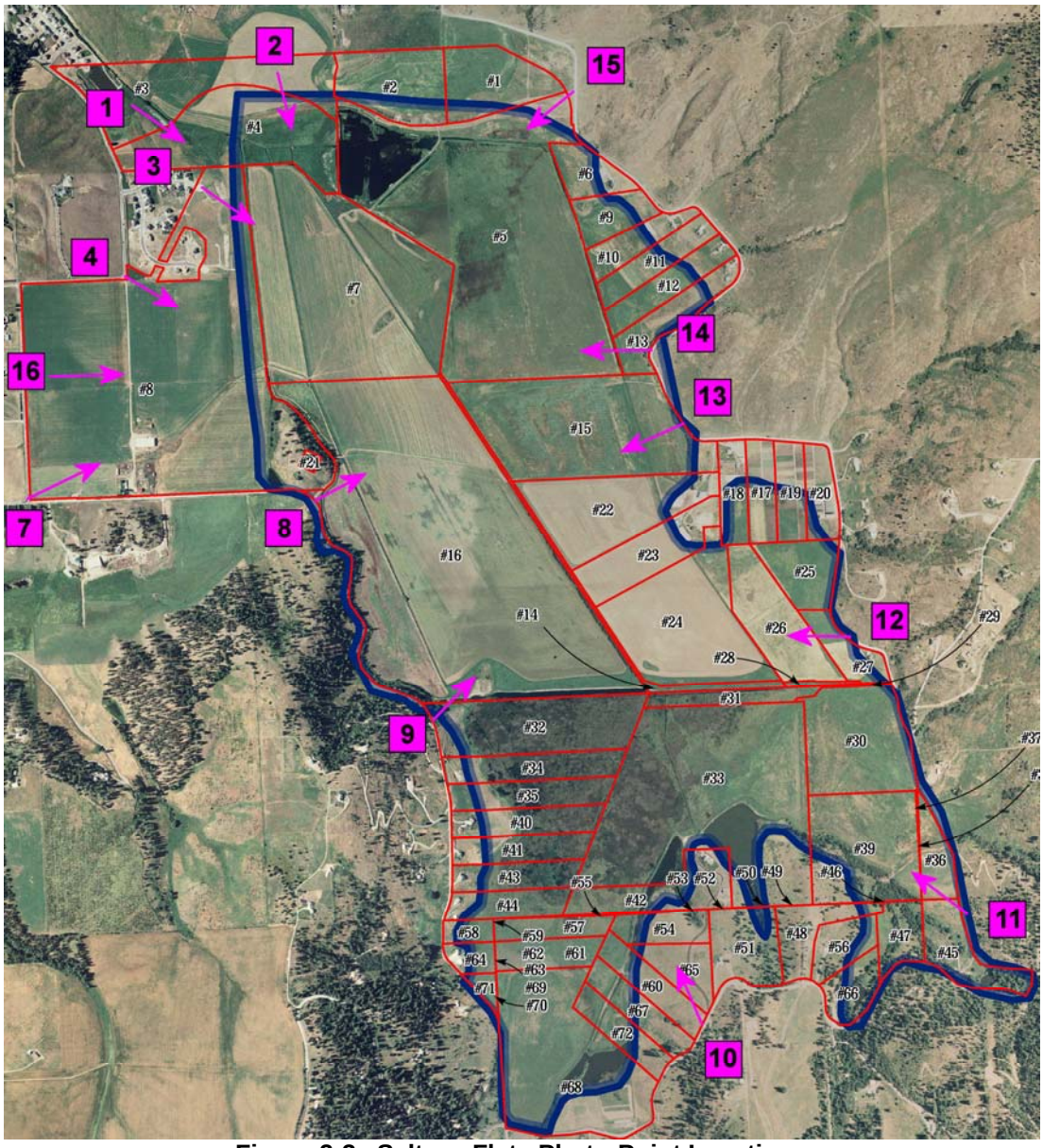


Figure 2-3. Saltese Flats Photo-Point Locations

2.3 Meteorological Data Compilation

As was noted in the *Existing Data Review* report, weather data is available from stations located at the Spokane Airport (1890-2008), Coeur d'Alene (1895-2008), and at the three locations near Liberty Lake as shown on **Figure 2-1**.

Data from the three Liberty Lake stations cover a shorter period of time (2001 to present) than the Spokane and Coeur d'Alene stations, but they are located in close proximity to Saltese Flats and can be considered representative. The stations are part of an ongoing monitoring program conducted by Liberty Lake Sewer and Water who have made the data available for this investigation. A summary of the average annual precipitation from the three Liberty Lake stations is presented in **Table 2-1**.

Table 2-1. Annual Precipitation at Liberty Lake

Year	Pine Terrace	Valleyway	Office
2001	11.88		
2002	20.51		
2003	17.82	7.56	
2004	17.60	15.60	
2005	19.97	15.84	14.50
2006	27.80	20.50	20.80
2007	16.63	12.90	13.37
2008	19.69	19.08	19.50
2009	9.70	7.95	8.35
Avg:	**20.00**	**16.78**	**17.04**

Precipitation numbers in inches per year
Shaded values are for incomplete years
Average is mean for complete years

The Pine Terrace station is located on the south end of Liberty Lake next to a seasonal 155-acre marsh and wetlands in a setting similar to Saltese Flats, and is considered to be the most representative of conditions at Saltese Flats. A summary of the average monthly precipitation for the Pine Terrace station is shown in **Table 2-2**, along with the average monthly values for the Spokane and Coeur d'Alene stations. These data are shown graphically on **Figure 2-4**. The Pine Terrace data shows a similar seasonal pattern to the Spokane and Coeur d'Alene data, with precipitation roughly midway between those two stations.

Table 2-2. Monthly Precipitation at Pine Terrace, Spokane, and Coeur d'Alene

	Pine Terrace										Spokane Airport	Coeur d'Alene
	2001	2002	2003	2004	2005	2006	2007	2008	2009	Avg		
Jan		0.60	2.80	0.75	1.45	7.60	1.83	2.74	0.80	2.3	1.99	3.41
Feb		1.80	1.30	2.50		1.15	2.40	1.85	1.05	1.7	1.54	2.43
Mar	0.50	5.30	3.10	0.90	2.75	2.60	1.55	2.40	4.25	2.6	1.39	2.27
Apr	1.50	1.10	1.53	1.10	1.05	2.25	0.85	1.80	2.05	1.5	1.11	1.72
May		2.00	0.78	2.70	3.05	1.80	1.20	1.45	1.30	1.8	1.42	1.98
Jun	1.53	0.60	1.20	1.65	1.92	3.20	0.70	2.10		1.6	1.21	1.8
Jul	0.25	0.55	0.01		1.20	0.10	0.90	0.80		0.5	0.55	0.71
Aug		0.23	0.45	1.45	0.50	0.10	0.35	1.35		0.6	0.63	0.9
Sep		0.30	1.25	1.30	0.65	0.35	0.25	0.50		0.7	0.79	1.26
Oct	1.65	0.20	0.50	1.25	1.90	0.75	1.60	0.15		1.0	1.17	1.95
Nov	3.20	2.18	1.35	1.95	2.95	4.40	1.75	2.00		2.5	2.1	3.15
Dec	3.25	5.65	3.55	2.05	2.55	3.50	3.25	2.55		3.3	2.21	3.65

Precipitation numbers in inches per month

An update was made to the Cumulative Departure curve for the Spokane and Coeur d'Alene stations that was previously presented in the *Existing Data Review* report. The updated plot is shown on **Figure 2-5**. As previously noted, five distinct periods are evident in the data. These consist of two below normal periods (1915-1939 and 1999-2004), one of roughly normal precipitation (1940-1944), and two periods including the most recent with above normal precipitation (1945-1998 and 2005-2008).

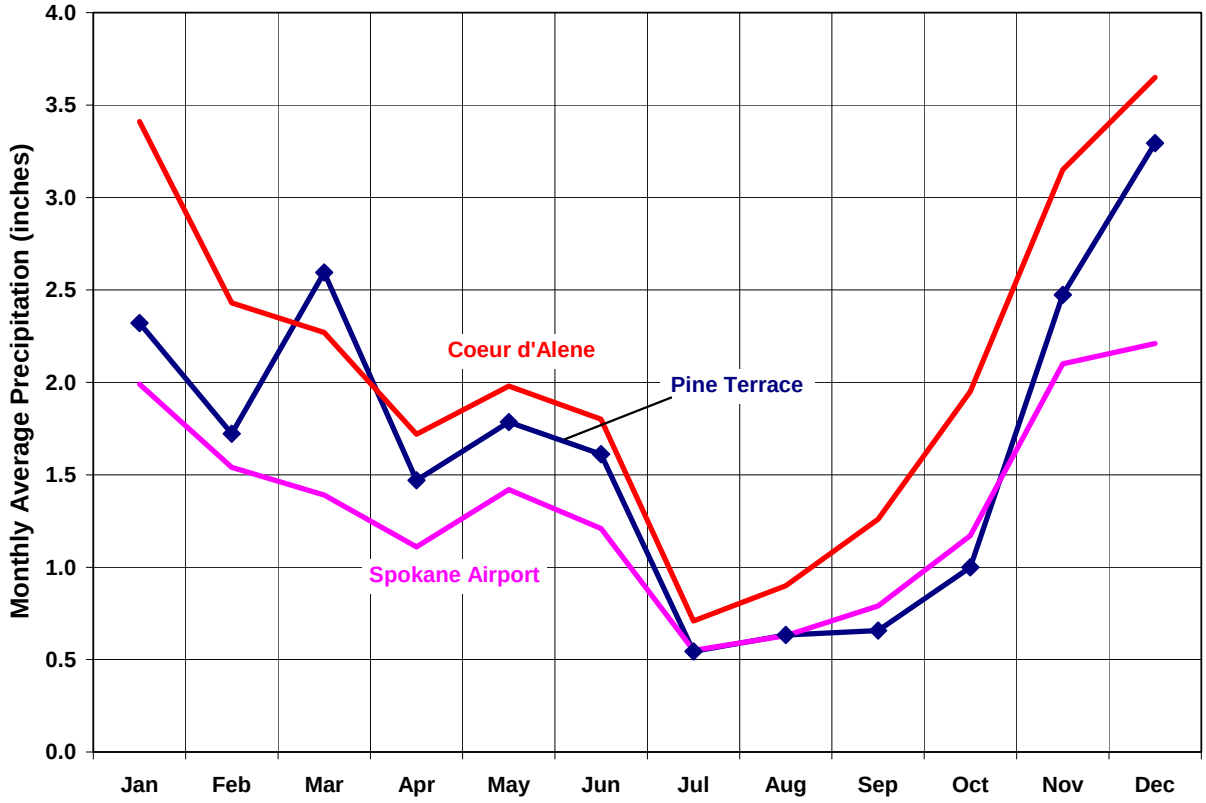


Figure 2-4. Average Monthly Precipitation at Stations Surrounding Saltese Flats

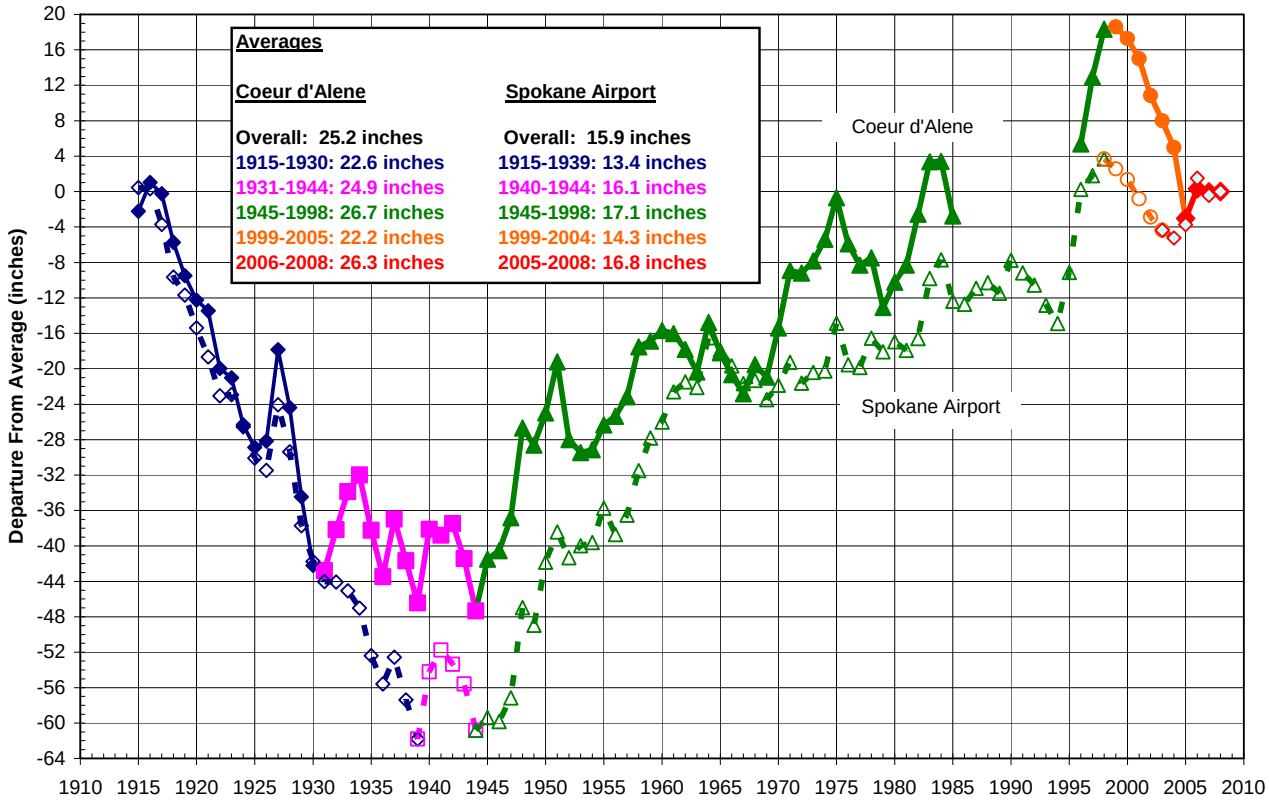


Figure 2-5. Precipitation Cumulative Departure Plots

2.4 Soil Borings and Well Installations

Soil borings were completed at the site in November 2008 using truck mounted push-drilling (Geoprobe) drilling equipment. The drilling included 14 shallow (5-foot) borings that were completed as monitoring wells at the locations shown on **Figure 2-2** (SFW-1 through SFW-14), four deeper borings (21 to 33 feet) at the locations shown on **Figure 2-2** (B-1 through B-4), and one attempt to identify depth to bedrock by pushing a solid drill rod until refusal was encountered. Logs for the deeper borings with descriptions of the materials encountered are included as **Appendix C**.

All of the borings encountered a layer of fine-grained organic material described as "organic muck" in the upper several feet. The deeper borings indicated the surficial organic layer ranges in thickness from five to 11 feet. Below the surficial organic material are alternating layers dominated by fine to medium sand and additional organic layers. This description is consistent with a log for a boring drilled previously in the middle of the Flats (Ecology ID 155203, included in **Appendix C**) which describes a similar pattern of alternating sand and fine-grained layers to a depth of at least 242 feet (bedrock was not encountered). The attempt to push a solid drill rod to bedrock met refusal at 125 feet. It is assumed that this depth is at or near bedrock but the nature of this method cannot be regarded as conclusive. This depth does not seem unreasonable since bedrock outcrops are common around the perimeter of the Flats.

Monitoring well completion at the fourteen locations noted above consisted of 2-inch diameter PVC pipe with 3 feet of slotted screen. Surface completion included locking well caps with cemented flush-mount seals and flagging installed next to the wells to help locate them during the growing season. Ground surface and top of casings elevations were surveyed by Spokane County Utilities during the topographic survey. Water level data and groundwater sampling results are described below.

Soil samples were collected from upper (0-1 feet) and lower (4-5 feet) intervals of each of the shallow borings. The purpose of these samples was to evaluate the range of properties observed in surface soil materials that would be used in wetland construction. Ten of these samples were submitted to an analytical laboratory for analysis of common soil properties including pH, texture, organic matter content, phosphorus, nitrate, potassium and sulphate. Laboratory reports are included in **Appendix D**. These analyses provide baseline information useful conceptual designs. Results showed mostly acidic to neutral pH and silty or organic textures. Organic contents were low in the mineral soil layers (mostly <15%) and high in the organic soil layers (50-60%).

2.5 Wetland Delineation

PBS&J delineated wetlands at Saltese Flats during September 2008 to evaluate wetland status, wetland characteristics and the potential for wetland restoration. Routine wetland determination methods were used to evaluate the area including Options A and B (**Figure 1-3**) at the northern portion of the Flats. These methods included the latest Army Corps of Engineers guidance based on the *Interim Regional Supplement: Arid West Regions* and the 1987 Wetland Delineation Manual. Wetland boundaries, sampling points, and photo point locations were captured using a resource-grade, hand-held GPS unit for the wetland delineation.

Reconnaissance-level wetland determination methods were used across the remainder of the area within Option C. These methods used air-photo interpretation and views from public roads combined with experience on the adjacent Option A & B areas to complete a reconnaissance level map of wetland distribution. Wetland boundaries in this area were delineated on air photos and wetland characteristics were estimated and summarized in the following text.

Routine Wetland Mapping

Data gathered during wetland delineation is included in **Appendix E**. **Figure E-1** illustrates the Routine and Reconnaissance Wetland Mapping Areas. **Figure E-2** illustrates the distribution of wetlands within the Reconnaissance Wetland Mapping Area. Data illustrated on these figures include wetland boundaries, transect location, sampling points, and photo point locations. Also included in **Appendix E** are Army Corps of Engineers Routine Data forms for sampling points that describe the vegetation, hydrology, and soils in more detail. A selection of routine data forms are included in this report that represent the range of wetland types observed within the routine mapping areas. These forms include Sampling Points 2, 4, 6, 7, 8, 9, 10, 16, 17, and 18. Also included in **Appendix E** are photographs illustrating the range of wetland types observed.

Approximately 76 acres of wetlands were identified within Options A and B (**Table 2-3**). Most of this area probably met wetland criteria before artificial drainage in the late 1800s. Certain areas do not currently meet wetland criteria within Options and B due to a lack of wetland vegetation and wetland hydrology. Vegetation has been converted to hay crop species, especially orchardgrass and timothy. Groundwater levels have been lowered by drainage.

Table 2-3. Cowardin Vegetation Types Within Routine Mapping Areas

Vegetation Type	Acres
Aquatic Bed/Emergent	19.7
Emergent	48.1
Scrub-shrub	5.1
Forested	0.9
Total	76.2

Most wetlands within the routine mapping area are located in the northern portion of Saltese Flats. A few small wetland areas and other Waters of the United States (WOUS) exist between the northern and the southern wetland complexes within the farmed areas of Option A. A transect was established running from west to east across the northern portion of the flat to document changes in wetland characteristics and types. Sampling points along this transect document changes in wetland vegetation types and dominant vegetation. Additional sampling points located in wetland areas apart from this transect document other wetlands within the routine mapping area (Options A and B).

Wetland vegetation types within the routine wetland mapping area are based on the Cowardin System and are illustrated on **Figure E-2**. Cowardin wetland vegetation types recorded at the site included palustrine aquatic bed, emergent, scrub-shrub and forested vegetation types.

Wetland areas were dominated by the following vegetation:

- *Bidens cernua* – nodding beggartick
- *Eleocharis ovata* – ovoid spikerush
- *Echinochloa crus-galli* – barnyard grass
- *Phalaris arundinacea* – reed canarygrass
- *Populus sp.* - poplar
- *Scirpus acutus* – hardstem bulrush
- *Scirpus validus* – softstem bulrush
- *Sparganium emersum var. emersum* – bur-reed
- *Typha latifolia* – common cattails

Reconnaissance Wetland Mapping

Figure E-3 illustrates the distribution of wetlands within the Reconnaissance Wetland Mapping Area (Option C outside of the Option A and B areas). The Cowardin wetland types identified across the 236 acres of wetlands identified in this area are summarized in **Table 2-4**.

Table 2-4. Cowardin Vegetation Types Within Reconnaissance Mapping Areas

Vegetation Type	Acres
Aquatic Bed/Emergent[1]	82.7
Emergent	105.1
Scrub-shrub	0
Forested	24.2
Total	236.3

1 – Areas of shallow standing water that were discernable on the aerial photography were mapped as a combined type of aquatic bed and emergent.

HGM Wetland Classes

The HGM classes recorded for the wetland areas included depressions, sloped, and riverine. The HGM class for depressions consisted of the Graham pond (see **Figure 1-3**) and other low-lying areas that were inundated during the time of the investigation and have topography that hold standing water. The sloped classes consisted of areas dominated by herbaceous vegetation that surrounded the pond and had topography that rose in elevation away from the existing standing water of the pond. These areas receive annual inundation from the fluctuating water levels of the pond. The riverine classes included several channels that function as irrigation ditches to either convey surface waters across the Flats for irrigation or to drain standing water upstream of the Morrison Diversion (see **Figure 1-3**). These areas are described as Water of the US (WOUS) on the figures due to presence of existing bed and bank feature. These channels convey water across the Flats toward the Graham pond or around the Flats toward the outlet on the northwest corner of the project area.

Vegetation Types

The four Cowardin vegetation classes identified at Saltese Flats are described below and include aquatic bed, emergent, scrub-shrub, and forested.

Aquatic Bed
The aquatic bed type consists of the shallow-water areas dominated by aquatic vegetation at the Graham Pond within the routine wetland mapping area. The aquatic bed type also occurs south of Options A and B where it is intermixed with emergent types dominated by common cattail (*Typha latifolia*) and softstem bulrush (*Scirpus validus*).

Emergent
The emergent vegetation type dominates wetlands within both the routine and reconnaissance areas with several distinct community types includes reed canarygrass (*Phalaris arundinacea*), common cattail (*Typha latifolia*), cattail / hard and soft bulrush (*Scirpus acutus and validus*), and barnyard grass (*Echinochloa crus-galli*).

The *reed canarygrass type* includes emergent vegetation dominated by a mono-culture of reed canarygrass with minor inclusion of bedstraw (*Galium sp.*). These types were primarily located within the northwest corner of Saltese Flats, west of the Graham Pond, and are inundated throughout the season or consist of a fringe along the extensive ditch system with the Flats.

The *Cattail / Hard and Soft Bulrush ty*pe includes emergent vegetation located within the shallow waters of the Graham Pond and other inundated areas of the Flats. These types are adapted to the fluctuating water table throughout the season with the majority of the area inundated with standing water. Areas consist of emergent vegetation dominated by cattails and both hardstem and softstem bulrush with minor inclusion of nodding beggartick (*Bidens cernua*)**,** barnyard grass, willowherb (*Epilobium ciliatum*), bur-reed (*Sparganium emersum var. emersum*), and reed canarygrass.

The *barnyard grass type* includes areas of saturated to slightly inundated areas located away from the main wetland complexes within the farmed areas. These sites are dominated by barnyard grass, toad rush (*Juncus bufonius*), sedge (*Carex sp.*) and smartweed (*Polygonum sp.*).

Scrub-Shrub
Scrub-shrub vegetation type was located within one area of the detail mapping boundary along an irrigation channel of the historic Saltese Creek along on the east side of the Morrison property on the southern end consisting of Hawthorn.

The hawthorn type includes scrub-shrub vegetation that lines an existing irrigation ditch and is dominated by Hawthorn (*Crataegus sp.*). The thick shrub layer has an emergent understory consisting of mostly reed canarygrass.

Forested
The forested type within the project boundary consists of a small stand of poplar planted near the Graham pond and a native poplar area along a wetland / riparian area within the recon area. Two distinct types were observed including poplar (*Populus sp.*) and quaking aspen (*Populus tremuloides*).

The planted poplar type is located near the Graham pond and is inundated throughout the season during high water periods caused by spring runoff or operation of the drainage system. This area was planted to evaluate the potential for poplar cultivation and has an even distribution pattern. The type is dominated by an overstory of poplar and understory of emergent vegetation including beggars-tick, reed canarygrass, toad rush, and barnyard grass.

Former Wetland Areas

Most of the area of Saltese Flats was wetland until it was artificially drained in the late 1800s. These areas have been farmed since, mainly for hay crops that were sub-irrigated by manipulating the groundwater level using a series of ditches. Water levels would be raised to within the root zone of crop plants to increase production. Water levels would be lowered to allow tillage, seeding and harvest.

These areas do have soils that meet hydric criteria due to the high organic matter surface layer (histosols or histic epipedon). These areas do not have wetland vegetation due to the conversion to crop plants, mainly orchardgrass, timothy and Kentucky bluegrass. These areas do not have wetland hydrology due to manipulation of groundwater levels using the drainage system. Groundwater monitoring data is discussed in **Section 2.7** below. **Figure 2-11** illustrates groundwater depths below ground level in May 2009 when maximum groundwater elevations would be expected. This figure indicates that depths across the Option A and B areas ranged from approximately 1-3 feet (too deep to qualify as wetland hydrology). **Table F-2** in **Appendix F** lists depths to water below ground surface for each sampling date. These values show higher water levels in April than in May which is contrary to expectations. Our experience in monitoring numerous wetlands suggests that groundwater levels usually peak after surface water flows by 2-6 weeks which would be in May at this site. Discussions with the landowner who controls the drainage system revealed that it was his manipulation of the drainage system that resulted in lower water levels during May than April. This confirms that wetland hydrology is not currently present across most of the Option A and B areas due to drainage.

2.6 Surface Water Stage and Discharge

As a review, the Saltese Flats drainage basin covers about 14,000 acres as shown on **Figure 2-6**. The drainage basin shown for the Flats was drawn using topographic highs that define drainage divides separating those that drain into Shelley Lake and Saltese Flats and those that do not.

Although a number of small drainages route water into Saltese Flats at times during the year, water primarily enters the area through three main creek systems consisting of Saltese Creek, Quinnamose Creek, and an unnamed tributary as shown on **Figure 2-6**. The Saltese Creek outlet occurs at the northern end of the site and the creek flows northwest, ultimately discharging into Shelley Lake. The outlet is dry during summer months. Shelley Lake has no outlet and water in the lake infiltrates into the groundwater system and eventually recharges the Spokane Valley Rathdrum Prairie (SVRP) aquifer.

A series of ditches were developed beginning over one hundred years ago to drain the Flats for agriculture. The original outlet was enlarged and lowered as much as 15 feet to prevent the Flats from flooding. Prior to these changes and the addition of artificial drainages, the Flats area was a seasonal lake.

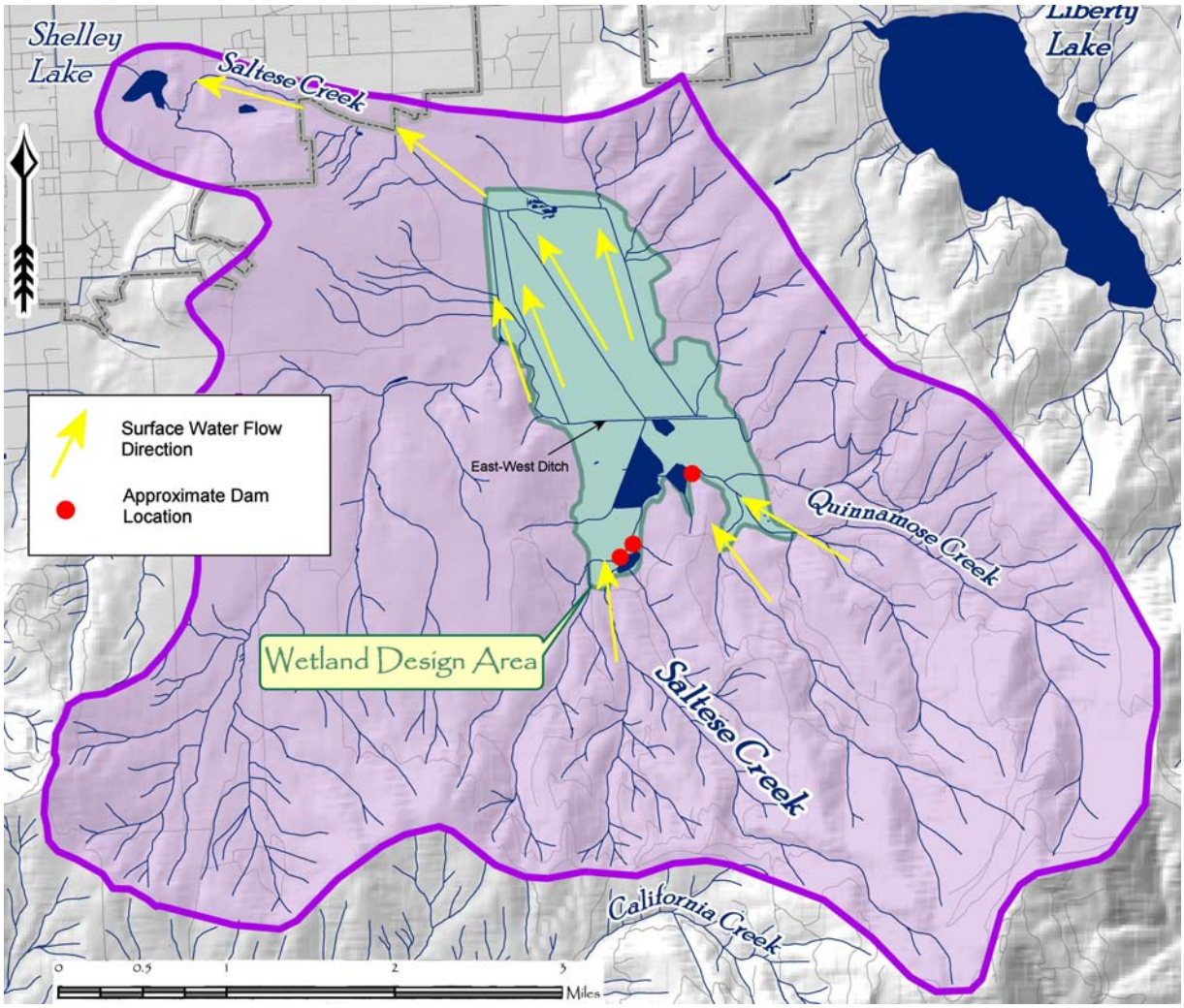


Figure 2-6. Watershed and Surface Water Related to Saltese Flats

Water level and discharge data gathered for this investigation include data collected as part of the ongoing monitoring program for this study and data for the Liberty Lake area provided by Liberty Lake Sewer and Water District staff.

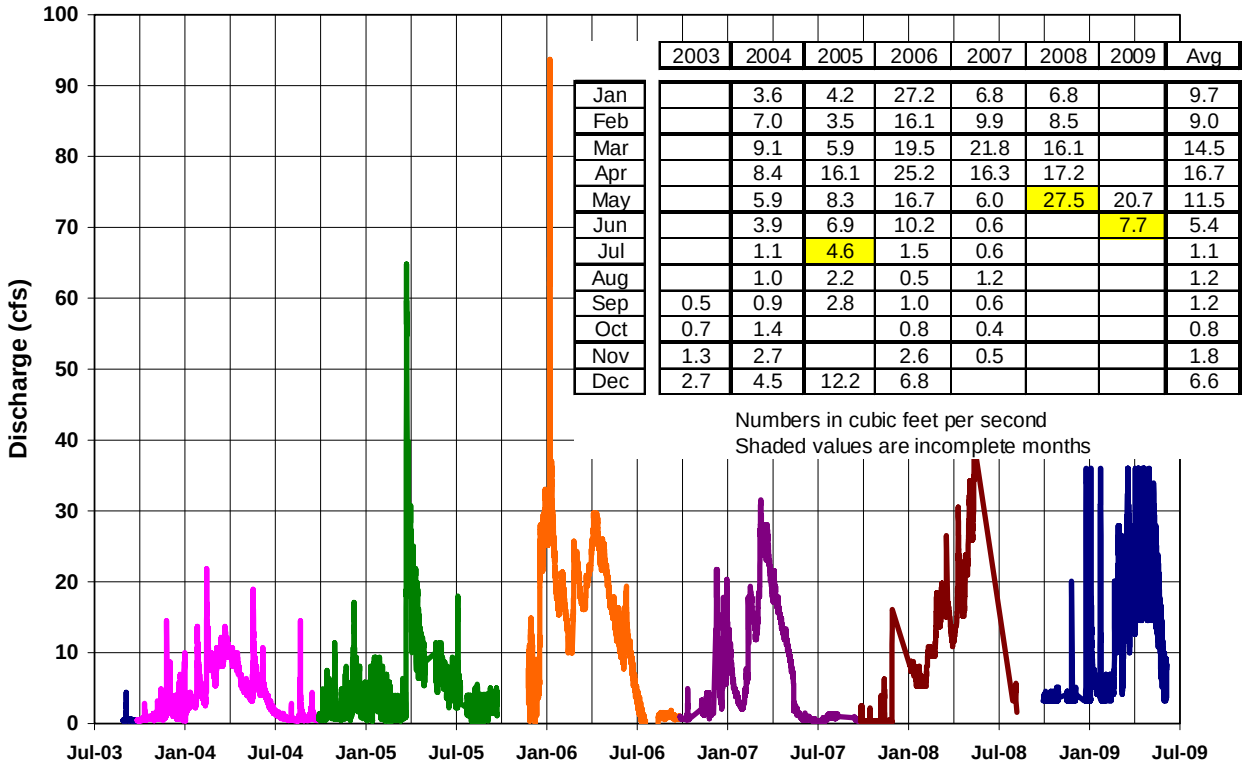
Twelve locations were identified as surface water monitoring locations in and around Saltese Flats. These locations are on **Figure 2-1** and **Figure 2-2**, and are summarized in **Table 2-5**. Staff gages were installed at ten of the locations, and water levels and discharge were measured periodically beginning in November 2008. In addition to these locations, four intermittent inlets to the Flats were identified (C-1 through C-4 on **Figure 2-2**) and were observed periodically to evaluate whether or not these inlets provided any significant contribution to the Flats. Water level and discharge data collected at these stations are included in **Appendix F**. Discharge was measured during low, average, and high flow conditions in order to develop "rating curves" which allow the translation of water level or stage readings into discharge values. There are sufficient data to develop rating curves for four of the sites (SC-7, MP-1, UT-1, and QC-1) and the rating curves are included in **Appendix F**. Additional discharge measurements will be needed to improve the accuracy of these rating curves and to have adequate data to develop curves for SC-1 and SC-6. Sites SC-2 and SC-3 are regularly affected by manipulation of discharge from Saltese Flats and it has not been possible to get reliable flow measurements at those locations.

Table 2-5. Surface Water Monitoring Locations

ID	Name	Description	Stage/Flow	Water Quality Sample
SC-1	Saltese Creek	Creek, above Flats	Stage-Staff Gage Flow-Meter/Profile	Yes
SC-2	Unnamed Channel	Channel, 1 of 4 main ditch drainages in Flats	Stage-Staff Gage Flow-Meter/Profile	No
SC-3	Unnamed Channel	Channel, 1 of 4 main ditch drainages in Flats	Stage-Staff Gage? Flow-Meter/Profile	Yes
SC-4	East-West Ditch	Ditch separating north and south Flats	Observe to determine if gage needed	No
SC-5	Unnamed Channel	Channel, 1 of 4 main ditch drainages in Flats	Observe to determine if gage needed	No
SC-6	Saltese Creek	Creek, outlet from Flats	Stage-Staff Gage Flow-Meter/Profile	Yes
SC-7	Saltese Creek	Creek, upstream of inlet to Shelley Lake	Stage-Staff Gage? Flow-Meter/Profile	No
UT-1	Unnamed Tributary	Creek, above Flats	Stage-Staff Gage Flow-Meter/Profile	Yes
QC-1	Quinnamose Creek	Creek, above Flats	Stage-Staff Gage Flow-Meter/Profile	Yes
MP-1	Morrison Pond Outlet	Channel, outlet from pond	Stage-Staff Gage Flow-Meter/Profile	No
GP-1	Graham Pond	Pond, former peat mine	Stage-Staff Gage	Yes
SL-1	Shelley Lake	Lake, Saltese Creek discharge point	Stage-Staff Gage	Yes

In addition to the monitoring program locations, data were obtained from the Liberty Lake Sewer and Water District for Liberty Creek (water level and flow) and for Liberty Lake (water level). The Liberty Creek watershed is similar to that of Saltese Flats and was chosen to be a reference basin. The data from Liberty Creek is more detailed and covers a longer period than what has been collected so far for Saltese Flats, and is useful to interpret short-term fluctuations and long-term conditions at the Flats.

Liberty Creek discharge data are illustrated on **Figure 2-7**, with instantaneous readings shown on the graph and average monthly discharge values in the table. The maximum average monthly discharge of 16.7 cfs occurs in April, although the maximum instantaneous discharge is as high as 93 cfs. Low flows occur during late summer-early fall. The annual average discharge for Liberty Creek is 6.6 cfs. There are gaps in the discharge data for the creek for late 2008/early 2009 because the station needed to be relocated and discharge has not yet been calculated for all stages during that time.



	2003	2004	2005	2006	2007	2008	2009	Avg
Jan		3.6	4.2	27.2	6.8	6.8		9.7
Feb		7.0	3.5	16.1	9.9	8.5		9.0
Mar		9.1	5.9	19.5	21.8	16.1		14.5
Apr		8.4	16.1	25.2	16.3	17.2		16.7
May		5.9	8.3	16.7	6.0	27.5	20.7	11.5
Jun		3.9	6.9	10.2	0.6		7.7	5.4
Jul		1.1	4.6	1.5	0.6			1.1
Aug		1.0	2.2	0.5	1.2			1.2
Sep	0.5	0.9	2.8	1.0	0.6			1.2
Oct	0.7	1.4		0.8	0.4			0.8
Nov	1.3	2.7		2.6	0.5			1.8
Dec	2.7	4.5	12.2	6.8				6.6

Figure 2-7. Liberty Creek Discharge Data

A comparison of discharge data from the two basins on nine dates where discharge data are available for Saltese Flats is provided in **Table 2-6**. For a few of these dates some of the flow components into Saltese Flats were estimated but the numbers are believed to be reasonable. In addition, a plot of Liberty Creek discharge data along with combined discharge flowing into Saltese Flats is shown on **Figure 2-8**. The graph and table suggest that discharge into Saltese Flats may be only about half of that of Liberty Creek. A more thorough comparison of the two basins will require additional stage readings at Saltese Flats and development or improvement of rating curves for the gage stations.

Water elevation data for Liberty Creek and the three Saltese Flats inlets are shown on **Figure 2-9** to help compare water level trends between the two basins . The Saltese Flats gages show a similar pattern to that of Liberty Creek with levels peaking in late April. Quinnamose Creek and the Unnamed tributary both exhibit a fluctuation of about 0.5 feet or less, similar to that of Liberty Creek. Saltese Creek, however, shows a seasonal fluctuation of over one foot. As noted above, these data will be converted into discharge data in the future.

Table 2-6. Discharge Comparison Between Saltese Flats and Liberty Creek

Date	Discharge (cfs)			Ratio Saltese to Liberty Creek
	Saltese-In	Saltese-Out	Liberty Creek	
11/03/08	0.23	0	4.09	5.6%
11/18/08	0.88	0	4.09	21.5%
01/12/09	3.17	7.9	6.97	45.5%
04/21/09	14.62	11.8	34.1	42.9%
04/26/09	12.3	9.6	28.7	42.9%
04/29/09	10.5	6.68	23.9	43.9%
05/05/09	11.37	2.64	31.1	36.6%
06/06/09	6.37	0.45	7.1	89.7%
06/10/09	4.54	0.07	8.4	54.0%
			Average:	**42.5%**

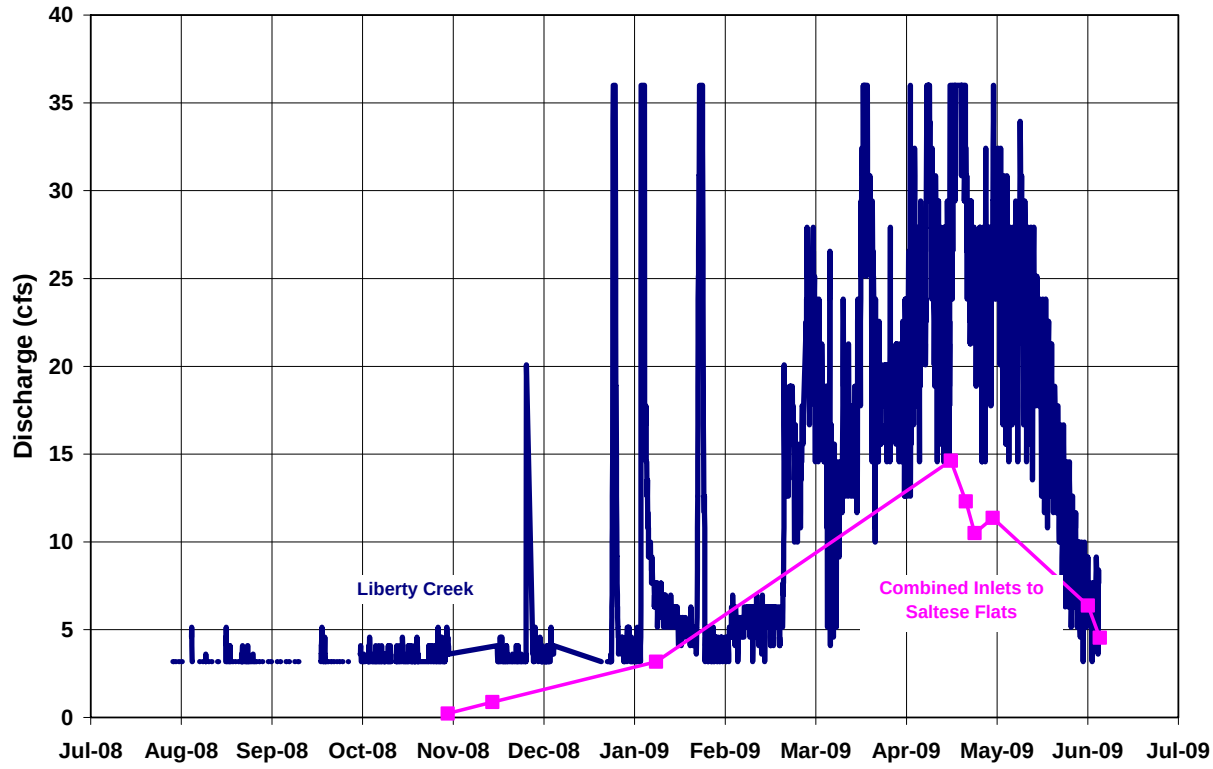


Figure 2-8. Liberty Creek Discharge Data

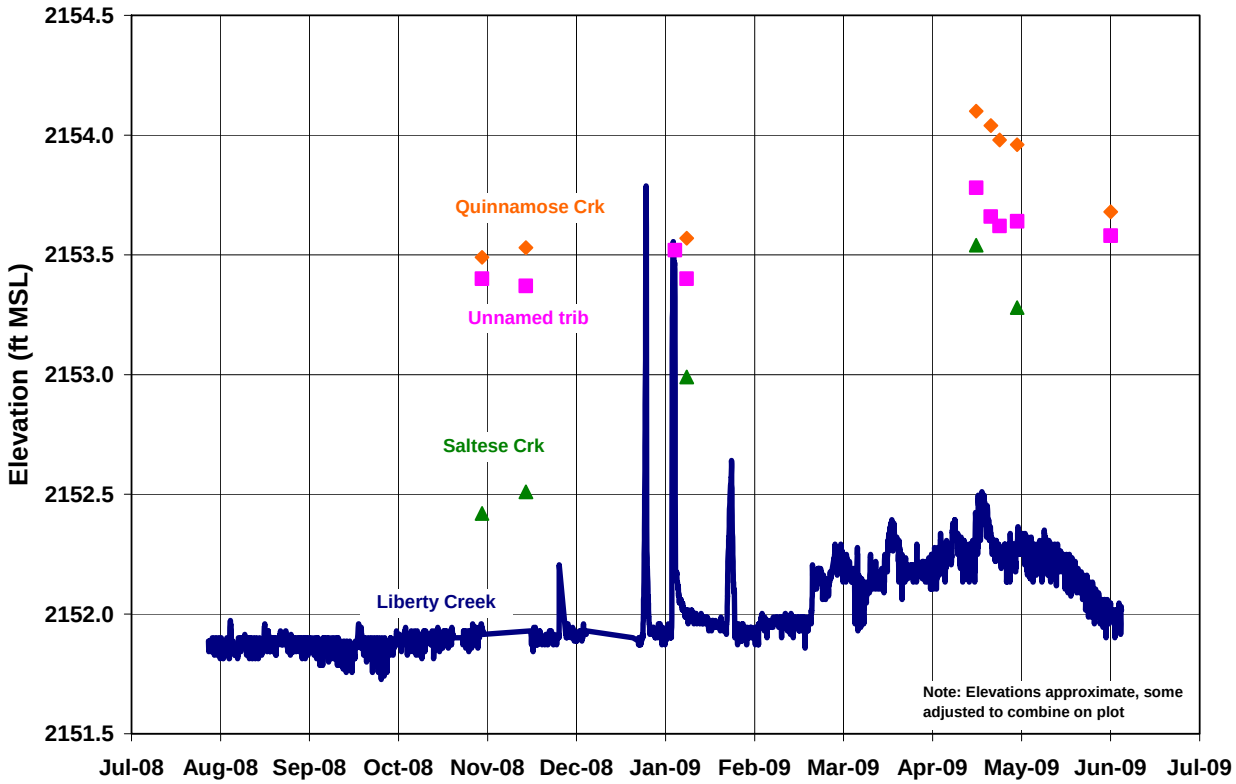


Figure 2-9. Water Levels for Liberty Creek and Saltese Flats Inlets

Downstream of Saltese Flats water level and discharge data have been collected for Saltese Creek at the outlet of the Flats (SC-6) and near Shelley Lake (SC-7), and lake level data has been provided for Shelley Lake from the Shelley Lake Homeowners Association staff. A plot of the water level data for these locations is shown on **Figure 2-10**. Shelley Lake levels range from highs of 2,017 ft MSL in late April-early May to lows of 2,002-2,004 ft MSL in late Fall. The timing of the lake level fluctuations corresponds to fluctuations in Saltese Creek levels. Saltese Creek at SC-7 is dry during portions of the year. In 2008 the creek was dry from about early June through December. In 2009 the creek was still flowing on June 10 although flow had declined substantially.

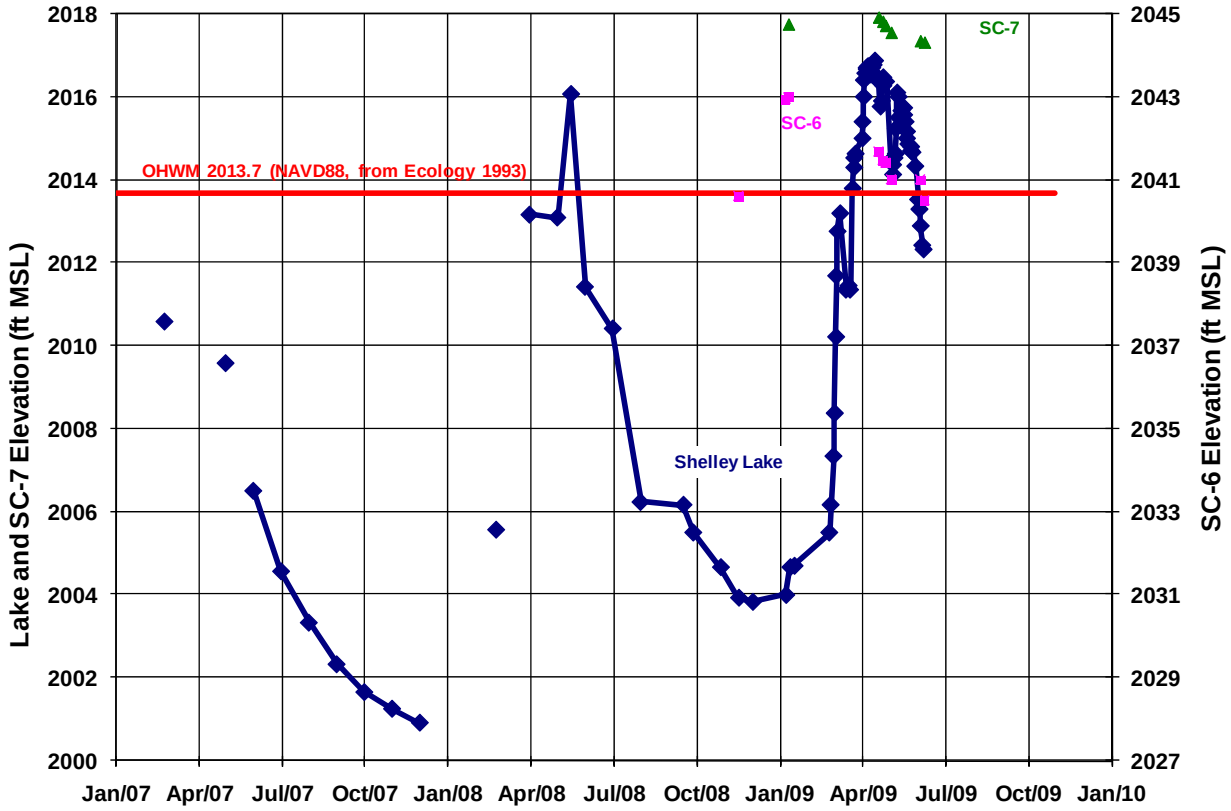


Figure 2-10. Water Levels for Shelley Lake and Saltese Flats Outlets

A plot of available discharge data for the Saltese Flats gages is shown on **Figure 2-11**, with Shelley Lake water levels included for reference. Flows in Saltese Creek at SC-7 range from 0 to roughly 12 cfs. When creek discharge exceeds the infiltration capacity of Shelley Lake, lake levels begin to rise, then decline again when Saltese Creek discharge drops below that threshold value. On January 12, 2009 discharge at SC-7 was measured at 7.9 cfs, and lake levels at that time were just beginning to rise, so the threshold value at that lake elevation was somewhere around 8 cfs. More information on infiltration estimates for Shelley Lake is discussed below in **Section 3.3**.

The discharge data shown above in **Table 2-6** is also useful to compare water flowing into the Flats to water leaving the area. The data show that there are times when water is entering the Flats at a greater rate than it is leaving, during which time water is going into storage (that is, groundwater levels are rising). At other times discharge from the Flats exceeds inflow, and this is when water is being removed from storage. It appears that storage of water is largely dictated by human manipulation of the discharge through control structures.

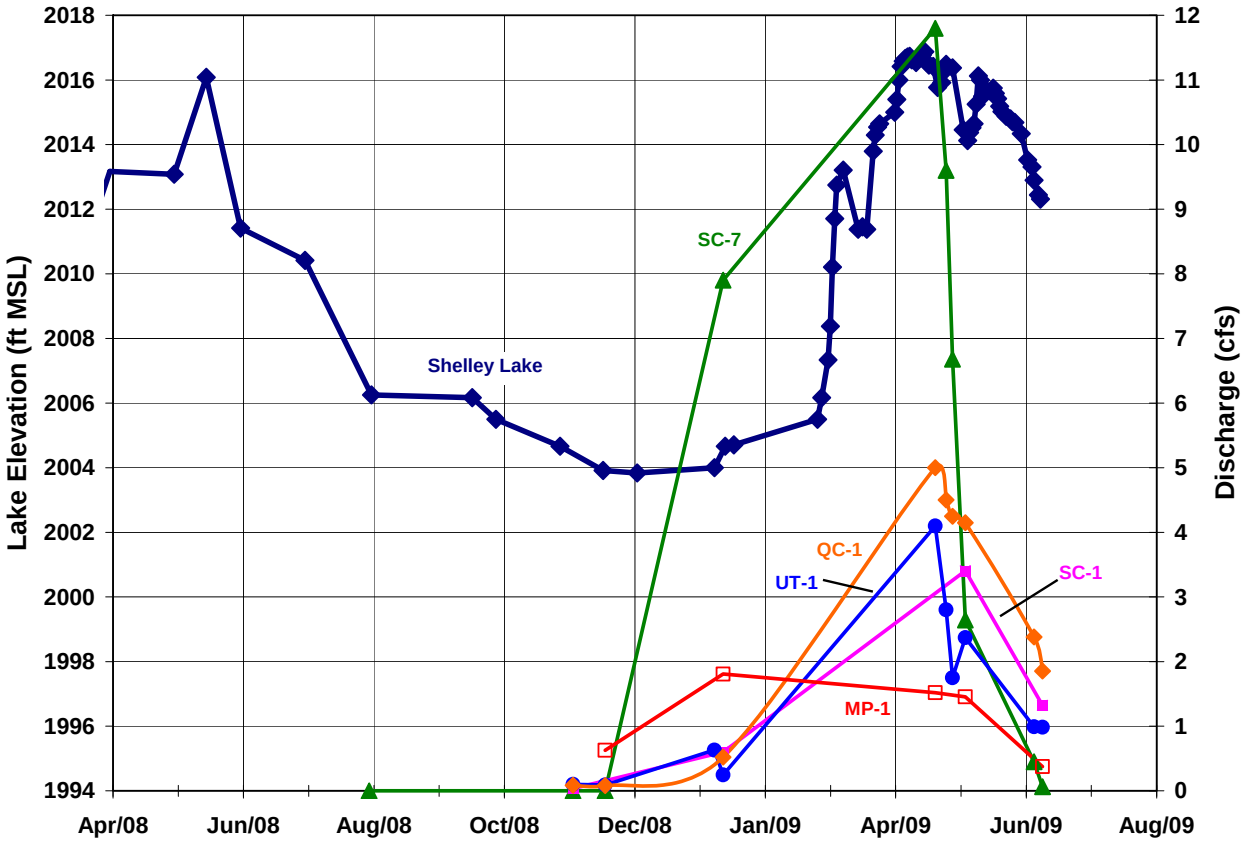


Figure 2-11. Water Levels for Shelley Lake and Saltese Flats Outlets

Surface water level data from gages on Saltese Flats is less informative at this time. Data from the two channels on the west side of the Flats (SC-2 and SC-3) are impacted by landowner water management activities (i.e. holding or releasing water from the Flats) and the infrequent measurements don't provide much insight on surface water patterns at that location.

The gage at Graham Pond showed an elevation change from roughly 2,041 ft MSL on November 18, 2008 to 2,043 ft MSL on January 12, 2009. After that time the pond level rose above the top of the gage and accurate levels could not be discerned. This gage will need to be modified to allow readings at high pond levels.

To the west of the site the location referred to as Morrison Pond (MP-1) exhibited fluctuations of only about 0.5 feet during the monitoring period. This location is recharged by intermittent drainages to the south and west which appear to flow between November and June. Water leaving the pond bypasses the Flats and joins into Saltese Creek near gage SC-6. At times some of this discharge is backed up into the Flats through use of a control structure which causes water to flow back towards gages SC-2 and SC-3. Discharge leaving the pond ranges from 0 to about 2 cfs.

Monitoring data collected to date is not sufficient in itself to estimate water flow through the Flats. However by comparing the data to nearby Liberty Creek an approximation can be made. As noted above, spot discharge measurements suggest water enters Saltese Flats at roughly half the amount carried by Liberty Creek (Flats values are less than half but it can be assumed that smaller tributaries provide some water during the year). Annual average discharge for Liberty Creek (2003-2009) is 6.6 cfs, so a preliminary estimate for water entering the Flats is about 3.3 cfs. For comparison, previous estimates of flow in Saltese Flats, shown in **Table 2-7**, show the estimate of 3.3 cfs is well below the majority of the previous estimates but does fall on the lower part of the range for modeled annual flow to Shelley Lake.

Table 2-7. Saltese Flats Flow Estimates

Flow	Description	Reference
20,000 AFY (27.6 cfs)	Average water rights flow into Flats	Golder, 2004
17,400 AFY (24 cfs)	Annual Flats contribution to SVRP	USGS, 1981
18,015 AFY (24.9 cfs)	Annual Flats contribution to SVRP	Buchanan and Olness, 1993
8,700-15,700 AFY (12-21.7 cfs)	Wet/dry year flow into Flats	Golder, 2004
17,375 AFY (24 cfs)	1959 Flats contribution to SVRP	Drost and Seitz, 1978
17,375 AFY (24 cfs)	Annual Flats contribution to SVRP	Thomas, 1963
2,613-4,090 AFY (3.61-5.65 cfs)	Modeled annual flow to Shelley Lake	Kahle and Bartolino, 2007

2.7 Water Management at Saltese Flats

Water flows into and out of Saltese Flats have been artificially managed since the lake was originally drained. This management has allowed the area to be used for crop production and grazing. A court decision in 1947 confirmed the owner's right to manipulate water levels across Saltese Flats.

Figure 2-12 illustrates important components of the Saltese Flats water management system. Water enters the southern portion of the Flats from several creeks and groundwater sources. The southern portion of the Flats is a wetland area dominated by cattail and bulrush. A berm has been constructed running east-west across the Flats at the boundary of the wetland area and the agricultural fields to the north. Construction of this berm was begun in the 1940s which stimulated the lawsuit and court decision. This berm allows water to be backed up on the south side of the berm so that it can be routed into the bypass ditch which runs from south to north along the western edge of the Flats (**Figure 2-12**). This bypass ditch allows water to be moved from south of the berm to the entrance of Saltese Creek at the northwest corner of the Flats. Water moving through this bypass ditch can leave the Flats by gravity and flow down Saltese Creek.

Several additional ditches are also present at Saltese Flats (**Figure 2-12**). These ditches are not regularly used in current management but can be useful for moving water around the Flats. All of these ditches move water toward the northwest portion of the Flats and terminate at a pump site (**Figure 2-12**). The elevation of the ditch at the pump site is lower than the entrance to Saltese Creek so this pump site is used to raise water from the ditch system to the creek so it can exit the Flats. Although the pump has not been used in recent time, it remains at the site as does electric power. This is a high-volume/low-head pump and is reported to be very effective at lowering water levels across the entire Flats. It was used in the past to lower the water table and facilitate peat harvest in the northeast portion of the Flats.

The berm, ditch and pump have historically been manipulated throughout the year to provide conditions suitable for crop production and harvest. The goal of this effort has been to provide sufficient water for crops without having too much water during the growing season and harvest periods. Throughout the winter, inflows to the Flats are monitored by the landowner. If it appears to be a "wet year" with lots of water, the landowner lets more water flow through the bypass ditch and exit to Saltese Creek. If it appears to be a "dry year" with limited runoff, the landowner does not bypass the water but holds more water on the Flats and keeps flows into Saltese Creek to a minimum. During the growing season, water is allowed to flow onto the Flats and groundwater levels are allowed to rise within the rooting depth of the crop (mainly grass hay) to increase production. During harvest, water can be routed around the Flats using the bypass ditch if necessary to dry out the surface enough to allow harvest equipment access.

In addition to the water management practices discussed above, nutrient management has also been an ongoing part of farming practices at the site. Fertilizer is added each year to improve crop yield across

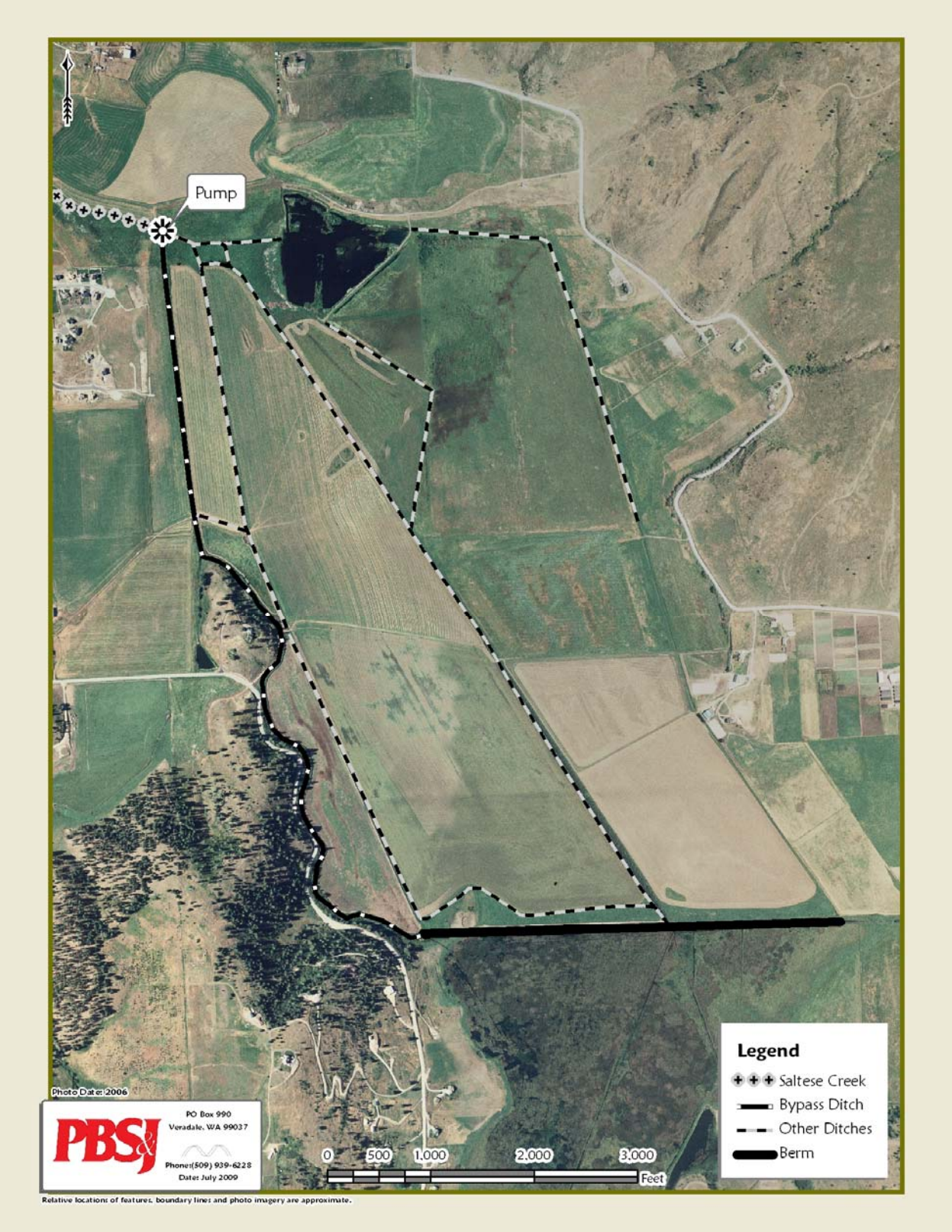


Figure 2-12. Saltese Flats Water Management Features

the 342 acres Morrison property on Saltese Flats. Approximate annual average fertilizer additions to this acreage are:

Nitrogen	170 pounds per acre	58,140 pounds per 342 acres
Phosphorus	40 pounds per acre	13,680 pounds per 342 acres
Potassium	60 pounds per acre	20,520 pounds per 342 acres

The majority of this added fertilizer is removed with the crop during harvest but some remains on site and may contribute to high nutrient levels in surface and groundwater as discussed elsewhere in this report. This fertilizer input would cease with conversion of the site to a restored wetland.

2.8 Groundwater Levels

Depth to groundwater has been measured in the shallow onsite wells periodically since their installation in November 2008. The top of casing for each well and adjacent ground surface have been surveyed and groundwater depths converted to elevation. The shallow well groundwater level data collected to date are included in **Appendix F**.

A contour map of groundwater elevations measured in the shallow on-site wells on May 2, 2009 is shown on **Figure 2-13a**. The May contours, which represent slightly post-high water conditions, show a general pattern of northerly flow from the east-west ditch changing to northwesterly flow near the outlet of the Flats at SC-6.

Groundwater at the site appears to be heavily influenced by surface water levels and control strategies. At the time the May measurements were recorded, ground on the Morrison property was relatively dry, perhaps due to water management in the ditches, while the ground surface was saturated and standing water was present in areas to the east. This is reflected by elevated groundwater elevations at SFW-9 and SFW-10 which result in a westerly gradient at those locations, while low elevations occur at SFW-4 and at SFW-1 due to water being drained from the system by the ditch system.

For comparison, a contour map of groundwater elevations measured in the shallow on-site wells on June 23, 2009 is shown on **Figure 2-13b**. The June elevations are close to low-water conditions. Some wells at the time were inaccessible so the dataset is slightly different from the May measurements, but a general comparison can be made between the two conditions. In June the groundwater gradient is flatter than during the higher water conditions in May, largely because water levels declined more in upgradient wells to the east than in the wells on the Morrison property. As previously noted water levels in the wells on the Morrison property appear to reflect managed groundwater conditions which mean levels under high water conditions are artificially low, whereas wells to the east presumably reflect more natural seasonal fluctuations.

Depth to groundwater from ground surface on May 5, 2009 is shown on **Figure 2-14**. The data show that groundwater was present at the surface in some areas, and as deep as 3.3 feet in others. The shallowest groundwater occurred in the northeast area of the Flats and to the south near the East-West Ditch. Aside from one deep groundwater area near well SFW-13, the deeper groundwater occurred to the northwest, likely a reflection of water being drained out of the Flats through the surface water channels.

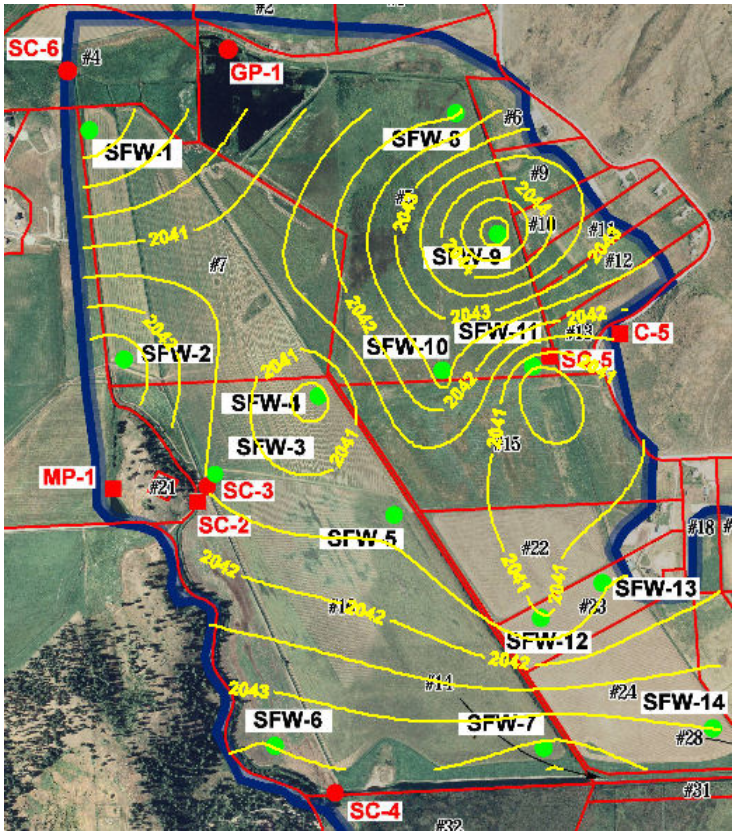


Figure 2-13a. Shallow Groundwater Elevations-May 2009

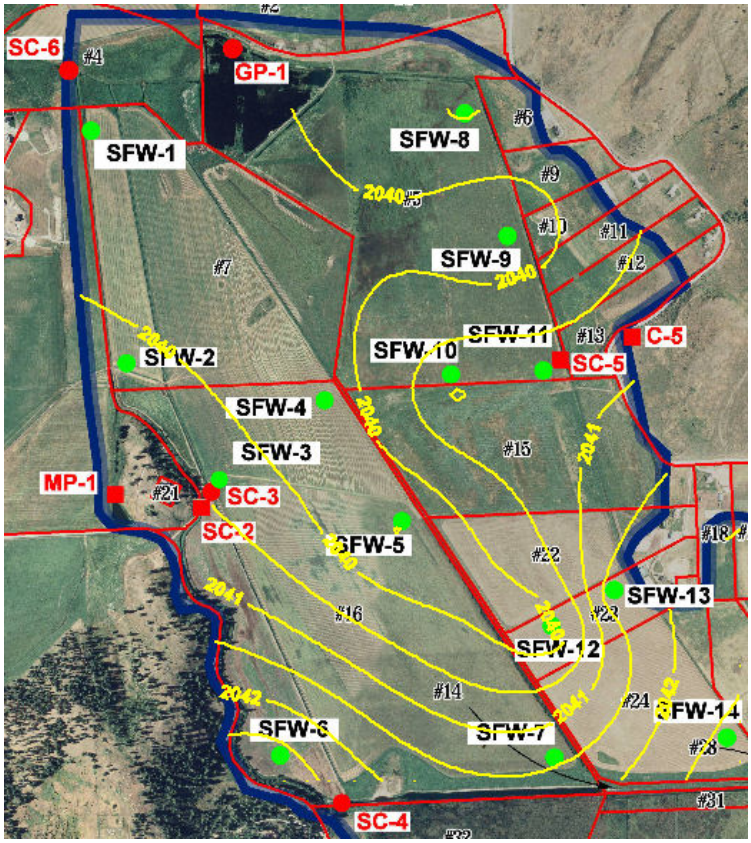


Figure 2-13b. Shallow Groundwater Elevations-June 2009

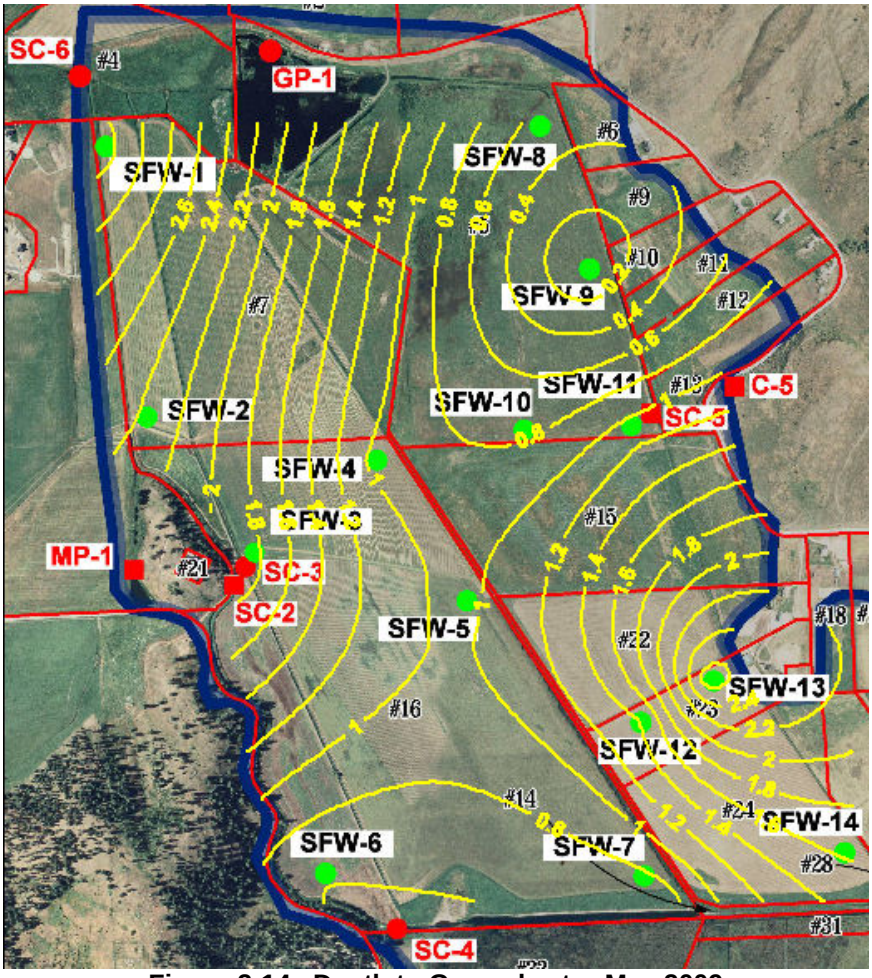


Figure 2-14. Depth to Groundwater-May 2009

It will be difficult to know the nature of the true natural seasonal groundwater fluctuations across the Flats as long as water management procedures using the ditch systems are maintained. The nature of current seasonal patterns in the wells cannot be fully evaluated until additional measurements are recorded, but data collected so far suggests groundwater depths are greatest in the fall and are closest to ground surface in late April, matching the pattern of surface water levels described in **Section 2.6**. Depth to groundwater below ground surface in the wells has ranged from about 0.5 feet to over 5 feet, although some of the wells had groundwater at the surface during the April 21, 2009 field visit. High groundwater conditions during the spring made several of the wells inaccessible. Some preliminary estimates of current seasonal fluctuations are shown in **Table 2-8**, which is based on assumed low groundwater levels. Seasonal groundwater fluctuations range from 1.2 to 5.1 ft, with an average value of about 3.3 ft.

Table 2-8. Preliminary Annual Groundwater Level Fluctuation Estimates

Well	Annual Groundwater Fluctuation (ft)	Well	Annual Groundwater Fluctuation (ft)
SFW-1	3.5	SFW-9	3.7
SFW-2	1.9	SFW-10	4.0
SFW-3	2.5	SFW-11	3.9
SFW-4	4.7	SFW-12	2.8
SFW-5	3.7	SFW-13	1.9
SFW-6	4.3	SFW-14	2.7
SFW-7	1.2		
SFW-8	5.1	**Average:**	**3.3**

2.9 Water Quality

Water quality data have been gathered for both surface water and groundwater at on-site and off-site locations. Water quality samples were collected on April 21, 2009 and again on July 16, 2009 from seven surface water and six groundwater locations. In addition, water quality data were provided by Spokane County Utilities for four wells in the SVRP aquifer north of the site that are sampled quarterly as part of a separate ongoing monitoring program. A summary of the analysis results and laboratory reports are included in **Appendix D**.

Well locations are shown on **Figure 2-1**. The On-site shallow wells were described in **Section 2.4**. The Off-site well locations are shown on **Figure 2-1** and **Figure 2-2**, and are summarized below in **Table 2-9**. Off-site wells include DW-1, sampled as part of the monitoring program for this study, and wells DW-2 through DW-5, sampled as part of the ongoing SVRP aquifer monitoring by Spokane County Utilities.

Table 2-9. Offsite Well Summary

ID	Ecol ID	Sp Co ID	Location	Type	Owner	Depth	Unit	Log?	Mon. Data
DW-1	308587	-----	Upgrad of Flats	Domestic	McGowan	400	Granite	Yes	WQ
DW-2	-----	5426L01	West of Flats	PWS	Vera Water & Power Well 4	NA	SVRP	Yes	WQ*
DW-3	-----	5518R01	Downgrad of Flats	PWS	Consolidated Irrig Dist 19, Site 2A	190	SVRP	Yes	WQ*
DW-4	-----	5517D05	Downgrad of Flats	MW	Near Cons Irrig Dist 4	112.5	SVRP	Yes	Levels, WQ*
DW-5	-----	5515C01	Downgrad Liberty Lake	PWS	Lib Lake Sewer Dist-Mission Well	179	SVRP	Yes	WQ*

* Data collected as part of quarterly program conducted by Spokane County

Results of the water quality sampling and analyses are discussed below in term of overall water quality conditions and how the different sample locations and types compare, along with a focused discussion on nutrient constituents. Seasonal variations in constituent concentrations are also discussed because the two sampling rounds represent high water and low water conditions.

General Water Type and Condition

The anion and cation data from the April sampling analyses were used to develop the Piper Diagram shown on **Figure 2-15**. Piper diagrams are used to classify the general type of water and to identify samples that are similar in nature (those that group together) and to evaluate transitions in water quality (those that plot in a sequence) that indicate changes in chemistry due to mixing with different water or some other alteration mechanism.

For groundwater samples, the SVRP aquifer samples all cluster tightly together illustrating those waters are very similar. The single upgradient bedrock sample plots close to those from the SVRP aquifer, but is in a different area of the plot because of higher sodium and potassium and lower calcium levels. The on-site shallow wells appear to show a transitional sequence beginning with the southernmost sample (SFW-7) and moving northwest toward the outlet of the Flats (SFW-1). This sequential change in the shallow groundwater is characterized by a combined lowering of bicarbonate and increase in chloride concentrations, along with a clear increase in TDS concentrations (illustrated by circles on **Figure 2-15**).

For the surface water samples, the sample from the Saltese Creek inlet (SC-1) shows a similar composition to that of the outlet (SC-6) and Shelley Lake (SL-1) indicating the surface water does not change significantly in composition as it moves through the Flats. The sample from Quinnamose Creek (QC-1) plots far away from the other samples due to a much lower bicarbonate content. The reason for that is unclear. The sample from Graham Pond (GP-1) is generally similar to the other surface water samples with the exception of sulfate which is elevated and more in line with the groundwater samples.

The summary water quality data tables in **Appendix D** (**Table D-1**, **Table D-2**, and **Table D-3**) show that the SVRP aquifer samples are all generally similar, with the only exceedance of standards noted being for well DW-2 which had a couple of minor exceedances of the secondary standard for iron. The upgradient bedrock well (DW-1) had no exceedances of standards, and as previously noted had water quality similar to that of the SVRP aquifer samples.

The shallow groundwater samples from the Flats on the other hand had elevated concentrations for a number of constituents, compared to those from the SVRP aquifer (**Appendix D**, **Table D-4**). Iron concentrations were high, ranging from 14-23 ppm and exceeded the secondary standard of 0.3 ppm in all samples. Sulfate concentrations were also high, exceeding the secondary standard of 500 ppm at well SFW-1 at the northern end of the Flats. Similarly TDS was elevated, exceeding the secondary standard of 500 ppm at well SFW-1.

Surface water samples all had generally low concentrations for the constituents analyzed (**Appendix D**, **Table D-5**). As noted before, these samples showed similar water quality concentrations with the exception of the Quinnamose Creek sample which had an anomalously low bicarbonate concentration.

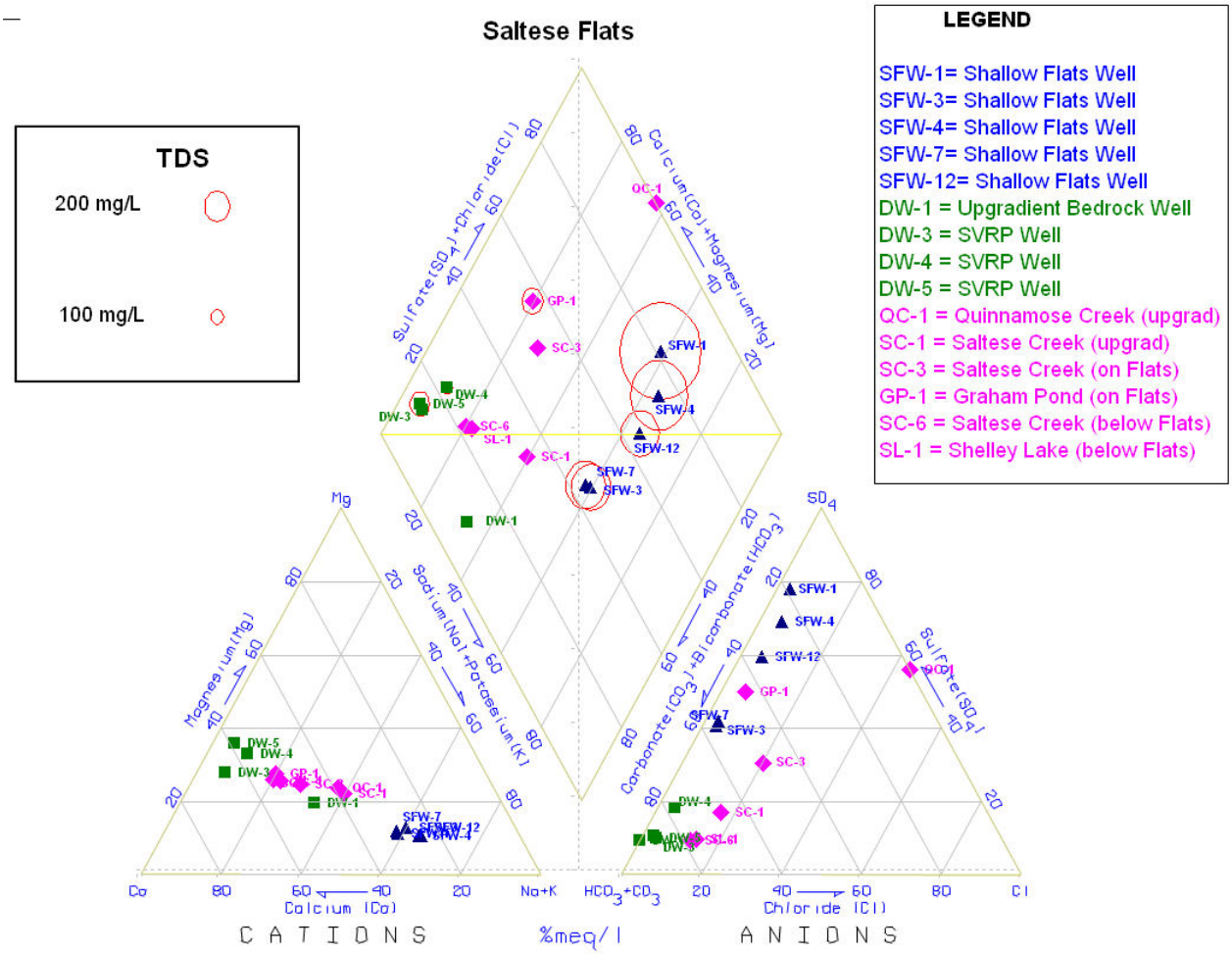


Figure 2-15. Piper Diagram of Water Quality Sampling Results

Nutrient Constituents

Saltese Flats Surface Water

Surface water sampling results showed that nutrients, summarized in **Table 2-10**, generally increased from the upstream monitoring sites to the downstream monitoring sites on Saltese Flats. On the Flats concentrations were higher for all constituents at GP-1 than at SC-3, reflecting the fact that water at GP-1 has flowed through the northern portion of the Flats while SC-3 represents more of a bypass. Seasonal variations shown in the table are discussed below.

Table 2-10. Synoptic Nutrient Sampling Results for Saltese Flats

Surface Water Quality Data

General Location:		Practical	Above Flats			On Flats		Below Flats	
Project ID:		Quantitation	QC-1	UT-1	SC-1	SC-3	GP-1	SC-6	SL-1
Site Name:		Limit (PQL)	Quinnamose Creek	Unnamed Tributary	Saltese Creek	Saltese Creek	Graham Pond	Saltese Creek	Shelley Lake
April 2009 (High Water/High Flow Conditions)									
Ammonia as N	mg/L	0.05	<0.05	<0.05	<0.05	0.075	0.430	<0.05	<0.05
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1	0.530	0.285	0.260	1.46	3.13	0.622	0.653
Total Phosphorous (P)	mg/L	0.005	0.0380	0.0488	0.0646	0.0555	0.0807	0.0803	0.0684
Nitrate (NO3)	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	0.100	0.449	0.149
Nitrite (NO2)	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Persulfate Nitrogen (TPN)	mg/L	0.1	0.148	0.158	0.260	1.13	3.56	0.747	0.952
Orthophosphate (OPO4)	mg/L	0.01	0.00971	0.0149	0.0241	0.0112	0.0462	0.0419	0.0114
July 2009 (Low Water/Low Flow Conditions)									
Ammonia as N	mg/L	0.01	0.028	0.026	0.039	0.047	0.099	0.209	0.047
Total Kjeldahl Nitrogen (TKN)	mg/L	0.1	0.158	0.199	0.168	1.55	2.85	1.59	0.629
Total Phosphorous (P)	mg/L	0.005	0.0224	0.0496	0.540	0.0695	0.217	0.198	0.0392
Nitrate (NO3)	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite (NO2)	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Persulfate Nitrogen (TPN)	mg/L	0.1	0.152	0.187	0.184	1.12	2.78	1.09	0.477
Orthophosphate (OPO4)	mg/L	0.005	0.0345	0.0502	0.0703	0.0320	0.133	0.0643	0.0228
Change between April and July									
Ammonia as N			----	----	----	↓	↓↓	↑↑	----
Total Kjeldahl Nitrogen (TKN)			↓	↓	↓	NC	↓	↑	NC
Total Phosphorous (P)			↓	NC	↑↑	↑	↑↑	↑↑	↓
Nitrate (NO3)			NC	NC	NC	NC	↓	↓↓	↓
Nitrite (NO2)			NC	NC	NC	NC	NC	NC	NC
Total Persulfate Nitrogen (TPN)			NC	NC	↓	NC	↓	↑	↓
Orthophosphate (OPO4)			↑↑	↑↑	↑↑	↑↑	↑↑	↑	↑

↓	↑	Decrease or Increase
↓↓	↑↑	Decrease or Increase greater than 100%
NC		Very little or no change
----		Unable to determine

In April ammonia was below the detection limit (<0.05 mg/l) at upgradient surface water locations (QC-1, UT-1, and SC-1). Locations on the Flats (SC-3, GP-1) showed ammonia values of 0.075 and 0.430 mg/l. Ammonia was below the detection limit (<0.05 mg/l) at downgradient surface water locations (SC-6, and SL-1). In July ammonia was detected at all sites but the detection limit was lower. Some seasonal variation in ammonia is evident by decreases at SC-3 and GP-1 and an increase at SC-6 between April and July.

Total Kjeldahl Nitrogen (TKN) in April ranged from 0.26 to 0.53 mg/l at upgradient surface water locations (QC-1, UT-1, and SC-1). Locations on the Flats (SC-3, GP-1) showed TKN values of 1.46 mg/l and 3.13 mg/l. Location GP-1 is more reflective of changes as water moves through the Flats and this sample shows elevated TKN values, indicative of nitrogen enrichment. TKN was (0.62 mg/l and 0.65 mg/l) at

downgradient surface water locations (SC-6, and SL-1). Between April and July TKN levels decreased at four locations (QC-1, UT-1, SC-1, and GP-1), remained unchanged at two locations (SC-3 and SL-1), and decreased at SC-6.

Nitrogen components nitrate and total persulfate nitrogen also showed similar trends to that of TKN. Between April and July concentrations of these constituents remained mostly unchanged at locations above the Flats and at SC-3. Nitrate showed a seasonal decrease at GP-1, SC-6, and SL-1. TPN also decreased at GP-1 and SL-1 but increased at SC-6.

Like nitrogen components, downstream increases in total phosphorus and orthophosphate were also apparent but less distinct. Upgradient sites were 0.038, 0.048 mg/l and 0.064 mg/l. Flat locations were 0.055 and 0.081 mg/l. Below Flats sites were 0.08 and 0.068 mg/l. A similar pattern of variability was observed for orthophosphate, with some indication of increase of orthophosphate from 0.024 to 0.042 mg/l from the uppermost site in Saltese (SC-1) to the lowermost site (SC-6). Between April and July total phosphorous showed a significant increase at three locations (SC-1, GP-1, and SC-6) and an increase as well at SC-3, while concentrations decreased at QC-1 and SL-1 and were unchanged at UT-1. Orthophosphate levels increased at all locations between April and July, with significant increases at QC-1, UT-1, SC-1, SC-3, and GP-1.

Nutrient results suggest a distinct increase in nitrogen components through Saltese Flats. Increases in phosphorus may also be occurring. It is worthwhile to note that these values tend to decline once surface water leaves the Flats, but still remain elevated relative to the uppermost sites.

The cause of nutrient enrichment through the Flats is undocumented, but is commonly associated with application of fertilizers or septic systems. Wetland systems are also known to generate nitrogen (and to a lesser extent phosphorus), especially if water tables are manipulated or periodically drained. The especially elevated values of nutrients observed in Graham Pond would appear to be a function of applied fertilizer rather than naturally occurring. It is worthwhile to note that Graham Pond also has elevated values for many other anion and cation constituents (**Appendix D**, **Table D-5**).

Finally, these conclusions should be interpreted with caution because two synoptic events are not sufficient to draw definitive conclusions about the source and fate of nutrients.

Shelley Lake

Shelley Lake field monitoring was performed on two dates in July and August of 2007 and that data was provided by the Spokane County Conservation District (**Appendix D**, **Table D-6**). Readings for pH, conductivity, temperature, and dissolved oxygen were taken at discrete sampling depths every meter to a maximum depth of 6 meters. Results on July 3 showed the lake was weakly stratified, with temperatures decreasing from 22.5 C to 17 C at the 6 meter depth. Conductivity increased slightly from 191 to 213 *u*mhos/cm. pH decreased from 9.2 to 7.4, and dissolved oxygen decreased from 8.8 to 1.3 ppm.

Results on August 14 showed the lake was weakly stratified, with temperatures decreasing from 22.8 C to 20 C at the 6 meter depth. Conductivity increased slightly from 202 to 252 *u*mhos/cm. pH decreased from 8.8 to 7.2, and dissolved oxygen decreased from 9.2 to 1.4 ppm.

Results from both sampling dates indicate that strong oxygen depletion is occurring at depth in Shelley Lake during the summer. Thermal stratification contributes to depletion, however, the main cause is likely to be nutrient enrichment and elevated oxygen demand created by decomposing organic matter in the lake bottom. Note that stratification was especially weak in the August event, and Shelley Lake continued to show a distinct oxygen sag. Observed oxygen levels are generally unsuitable for maintaining a fishery. Probable nutrient enrichment is supported by the Secchi Disk observation of 1.8-2 meters. Shelley lake would be considered a eutrophic system.

Primary productivity in Shelley Lake is likely to be phosphorus limited since large amounts of nitrogen are available via inflows from Saltese Flats. The possible contribution of nutrients from lakeshore development is unknown, but may also contribute to poor water quality with respect to trophic status.

Groundwater Nutrients

Overall, groundwater data showed much higher nutrient concentrations than surface water sites (**Appendix D**, **Table D-4**). Ammonia ranged from 0.489 to 7.39 mg/l. Five of the six shallow wells (SFW-1, SFW-2, SFW-4, SFW-7, and SFW-12) had ammonia concentrations greater than 2 mg/l. TKN ranged from 7.1 to 15.5 mg/l in these same wells. Total phosphorus ranged from 0.25 to 1.41 mg/l, and orthophosphate ranged from 0.034 to 0.056 mg/l. A single deep well (DW-1) did not show comparably elevated nitrogen levels. These nutrient values observed in shallow wells are greatly elevated relative to typically occurring background levels, and in particular the elevated nitrogen results strongly suggest contribution from fertilizer sources.

Because nitrates were not observed at detectable levels (<0.1 mg/l), oxidation of ammonia does not appear to be occurring at a significant rate in shallow wells. This suggests a strongly reducing/anoxic (i.e. oxygen deprived) groundwater system. This is consistent with perennially saturated conditions and low groundwater flow conditions.

3.0 WATER BUDGET

Water budgets for the Saltese Flats basin were developed to quantify water flow through the system and to assist in evaluating the feasibility of restoration scenarios. Several assumptions used in the development of the water budgets are based on limited data and therefore the water budget scenarios presented should be considered preliminary estimates of system behavior that may be refined as additional data become available.

3.1 Methodology

Water budgets for the Saltese basin were estimated by quantifying water inputs, outputs and storage. Inputs included monthly precipitation, surface water inflow, and groundwater inflow. Outputs included evapotranspiration (ET), vertical groundwater leakage to underlying consolidated sediments and bedrock, horizontal groundwater outflow towards the Spokane aquifer, and surface water outflow in Saltese Creek. Water budgets were developed for average conditions, a wet year (10^{th} percentile), and a dry year (90^{th} percentile). Water budgets were also developed to represent anticipated conditions for several management scenarios including application of reclaimed water. Water budget input/output parameters are described below.

Inputs

1) Precipitation: Precipitation estimates were derived using meteorological data from the Spokane airport, and a short term record at Liberty Lake. Monthly values for Saltese Flats were estimated by correlating the Liberty Lake record to the Airport record, and adjusting precipitation values for the airport data to reflect probable conditions. Average precipitation for the Saltese basin was estimated to be 19 inches, "dry" year precipitation was estimated to 13 inches, and "wet" year precipitation was estimated to be 27 inches.

2) Surface Water: Monthly surface water inflows were estimated using a methodology developed by the USGS for ungaged basins in western Montana (Parrett and Cartier 1990). This method was developed using gaged records from 59 watersheds in western Montana, and correlated monthly flows to physical characteristics including drainage area, basin relief, basin slope, mean annual precipitation, mean basin elevation, percentage of basin above 6000 ft, and basin perimeter. This multiple regression technique enables prediction of mean monthly flows, and also the 90^{th} or 10^{th} percentile flow values.

No comparable technique for estimating monthly flows has been developed for Eastern Washington. The Montana equations should be applicable to the Saltese basin because they were developed for watersheds with comparable physical characteristics (area, elevation, precipitation, vegetation, relief, meteorology, etc).

The area of Saltese Flats which contributes to surface and groundwater inputs amount to 21.9 square miles. Monitoring in 2009 was considered representative of an average year, and no surface water runoff was observed from discrete drainages serving nearly 12 sq. mi. of the basin. These areas are primarily located in the western half of the watershed, with some additional contributing area located at drier, low elevation locations along the Flats on the eastern boundary. The fate of precipitation in these dry areas and why surface water flow was not observed is unclear at this time. For purposes of modeling, a drainage area of 10 sq. mi. was used to develop monthly surface water flow estimates for "average" and "dry" scenarios. An area of 21 sq. mi. was used to represent anticipated contributing area for the "wet" year scenario.

3) Groundwater Inflow: Groundwater flux to the Saltese Flats area from the surrounding hillsides and small alluvial systems is difficult to quantify. No data exist to reliably estimate these values, however, they are likely to be relatively small compared to surface water inflows. The water budget makes the following assumptions to arrive at this value:

- A total cross sectional area for aquifers is 5000 feet^2;
- Average aquifer depth is 10 feet;
- Gradient is 0.01; and
- Hydraulic conductivity is 20 ft/day.

Outputs

1) Evapotranspiration (ET): Monthly evapotranspiration estimates were derived using meteorological data from the Spokane airport. The published pan evaporation rates were adjusted by a coefficient of 0.8 to represent evapotranspiration values for Saltese. Evapotranspiration for the Flats is estimated to be 38.7 inches/year.

2) Surface Water Outflow: The surface water output is a value that is calculated and can also serve as a calibration value. The calculation involves summing water inputs and accounting for storage plus outputs (ET, vertical leakage, groundwater outflow). The remainder is surface water flow. This value also served as a calibration metric by comparison of modeled results to field measurements in Saltese Creek.

3) Groundwater Outflow: Monthly groundwater flux leaving the Saltese Flats area is difficult to quantify due to limited data on aquifer characteristics. Water leaves the Flats via both surface and groundwater. Few data exist to reliably estimate these values, however, groundwater outflow is likely to be comparatively small relative to surface water outflows. Groundwater flow leaving nearby Liberty Lake has been estimated to be 3 cfs, but at Saltese Flats the geology is interpreted to be essentially a bowl of sediment with a narrow lip in the northwest which limits groundwater flow. The water budget makes the following assumptions to arrive at this value:

- A total cross sectional area for the aquifer is 80,000 feet^2;
- Average aquifer depth is 40 feet;
- Gradient is 0.005; and
- Hydraulic conductivity is 100 ft/day. Conductivity values and aquifer transmissivity (i.e. aquifer depth **x** conductivity) may vary from these assumptions, and may have a significant influence on modeled results if they differ greatly.

Storage

Storage of water in the Saltese Flats is a dynamic and significant factor influencing surface water outflows throughout much of the year. Water levels in the Flats rise and fall 3-4 feet over the course of the year. Surface water inflows go into storage during the spring as water levels rise, and water is lost in summer due to ET, and surface or groundwater outflows. Storage is also manipulated by human activities including drainage ditches, irrigation, and operation of stopboards placed in structures to retain or release water from the study area.

The storage component was estimated by using monthly changes in water level to determine storage (or release) by month. For purposes of creating the water budget, the majority of the Flats (720 acres) was assumed to respond uniformly. This is the area of the Flats with wet conditions created by excess surface and groundwater. The porosity of the soils and aquifer in the Flats was assumed to be 0.4. The monthly change in storage was estimated by multiplying the change in water level **x** area **x** porosity. This results in an ac-ft/mo estimate of storage. For example, a change in groundwater level of 1 ft corresponds to a change in storage of 720 ac **x** 1 ft **x** 0.4, or 288 ac-ft. Changes in water level of 4 ft over the season would result in 1152 ac-ft of storage.

Water released from storage is lost to a combination of ET, groundwater, and surface water. Partitioning this water into the various outflow components is a dynamic physical process that requires various assumptions to be made in the water budget. ET and surface water values can be most reliably estimated or measured. After adjusting for ET, the remaining outflow is partitioned between surface water and groundwater. Surface water flows entering and leaving the Flats have been measured though data are limited. The groundwater flux is estimated from slope **x** hydraulic conductivity **x** cross-sectional area and is assumed to be steady state. For purposes of the model, groundwater outflows were assumed to be constant. Although they are likely to vary seasonally, no physical data were available to reliably quantify groundwater outflows.

Shelley Lake

Modeled surface water output for water budget scenarios below is assumed to be delivered to Shelley lake. A variety of factors may influence actual delivery of water to the lake:

1) Modeled results for surface water output from the Flats (i.e. timing, flow rate, and volume) may differ significantly from conditions observed on the ground;

2) Infiltration of surface water in the reach of Saltese Creek between the Flats and Shelley Lake is not well documented, particularly for high flow conditions. A pair of readings from one point in time indicated a loss of 0.68 cfs between the outlet and Shelley Lake when water was leaving the Flats at 3.32 cfs. It is unknown how much that loss would increase during higher flows. It also appears that infiltration rates vary along the creek channel. Immediately below the Flats water has been observed in the channel year round but with no visible flow, while further downstream the channel is dry suggesting higher infiltration rates in the lower portion of the channel;

3) Groundwater outflows are likely to vary seasonally, and the assumed outflow rates may not be representative. Water leaving the Flats is largely assumed to be surface water, but may in fact leave the Flats as groundwater. Groundwater outflows are unlikely to reach Shelley Lake because of the high conductivity nature of the SVRP aquifer materials. Very little information is available to reliably quantify groundwater/surface water interaction at the transition from the Flats to the SVRP aquifer; and

4) Average and maximum infiltration rates for Shelley Lake are not well understood, particularly for scenarios where applied reclaimed water may increase inflow to Shelley Lake beyond baseline conditions. Infiltration rates are unlikely to be constant at 10-12 cfs, but may increase or decrease depending on the magnitude and timing of inflow conditions and the lake surface elevation.

Considerations

Finally, the Saltese project envisions a variety of wetland restoration/creation strategies that may ultimately influence the water budget calculations. However, these changes are likely to be relatively small for the following reasons. Potential changes in ET due to wetland creation are likely to have a minor influence on existing site ET and the overall water budget. Potential changes in storage may result from creation of wetland cells, but these too are likely to be minor unless additional storage is created on a large scale.

3.2 Water Budget Scenarios

Scenarios modeled using the water budget included the existing site under average year, dry year, and wet year conditions. The “dry” or “wet” years would each be infrequent conditions expected 10 in 100 years. Individual storm events were not modeled for purposes of developing overall water budgets. These modeling scenarios formed the baseline for additional scenarios involving the application of reclaimed water. Reclaimed water application rates of 7 mo/year (April 1-October 30) were considered for 8, 12, and 14 million gallons per day (MGD) in an average year, and 14 MGD in a wet year. These 7 scenarios are numbered below.

1) Existing condition, average year
2) Existing condition, dry year
3) Existing condition, wet year
4) 8 MGD, 7 months, average year
5) 12 MGD, 7 months, average year
6) 14 MGD, 7 months, average year
7) 14 MGD, 7 months, wet year

Results of these modeling scenarios are summarized in **Table 3-1** and **Table 3-2**, and individual scenarios are found in **Appendix G**. Results presented in **Table 3-1** and **Table 3-2** represent surface water outputs that are potentially expected to reach Shelley Lake. Individual components of water budget inputs and outputs are found in **Appendix G.**

Table 3-1. Average Outflow (cfs) from Saltese Flats by Modeling Scenario

	Existing Condition			Applied Reclaimed Water Scenarios				Infiltration
	Avg. Year	Dry Year	Wet year	8mgd/ 7mo/avg	12mgd/ 7mo/avg	14mgd/ 7mo/avg	14mgd/ 7 mo wet	Shelly Lake
Scenario	1	2	3	4	5	6	7	
Month								
January	2.45	1.30	5.19	2.4	2.4	2.4	5.37	12
February	1.77	0.96	3.86	1.8	1.8	1.8	3.99	12
March	-0.47	-1.42	4.76	-0.5	-0.5	-0.5	4.92	12
April	3.99	-5.37	36.70	21.3	27.5	30.6	71.27	12
May	3.26	-9.06	43.99	22.9	29.1	32.2	84.74	12
June	-2.28	-6.60	11.28	12.4	18.6	21.7	39.22	12
July	-1.02	-3.34	18.04	6.5	12.7	15.8	28.15	12
August	-1.41	-2.78	12.85	6.1	12.3	15.4	22.83	12
September	0.14	-0.96	10.83	8.9	15.1	18.2	23.76	12
October	5.02	3.54	13.46	15.1	21.3	24.4	29.46	12
November	4.07	2.97	8.55	4.1	4.1	4.1	5.76	12
December	2.73	1,67	5.17	2.7	2.7	2.7	5.30	12

*note: negative numbers indicate no surface flow.

Table 3-2. Average Outflow (Ac-Ft) from Saltese Flats by Modeling Scenario

	Existing Condition			Applied Reclaimed Water Scenarios				Infiltration
	Avg.	Dry	Wet	8mgd/ 7mo/avg	12mgd/ 7mo/avg	14mgd/ 7mo/avg	14mgd/ 7 mo wet	Shelly Lake
Scenario	1	2	3	4	5	6	7	
Month								
January	151	80	319.3	147	147	147	322	720
February	109	59	237.3	106	106	106	239	720
March	-29	-87	292.7	-28	-28	-28	295	720
April	245	-330	2256.7	1276	1647	1833	4276	720
May	200	-557	2704.5	1375	1746	1932	5084	720
June	-140	-406	693.4	747	1118	1304	2353	720
July	-63	-205	1109.1	392	763	949	1689	720
August	-87	-171	790.1	368	739	925	1370	720
September	9	-59	665.8	535	907	1092	1426	720
October	309	217	827.6	907	1279	1464	1767	720
November	250	183	525.7	244	244	244	346	720
December	130	102	318	164	164	164	318	720
Total	1122	-1174	10740	6233	8832	10132	19486	8640

* note: negative numbers indicate no surface flow.

Scenario 1: Baseline Conditions (Average Year)

Inputs

Scenario 1 represents baseline conditions in an average year. The runoff modeling suggested that combined peakflows for tributary streams entering Saltese Flats would be expected to approach 15 cfs, with baseflows of about 1 cfs (**Appendix G**, **Table G-1**). This corresponds to approximately 2720 ac-ft of surface water input.

Precipitation amounts to approximately 1140 ac-ft over 720 acres of the Saltese Flats area. Precipitation over the remainder of the drainage is accounted for in the surface water runoff and groundwater inflow estimates. Annual groundwater input to the Flats amounts to 8.3 ac-ft. The total input to the Flats (surface water, direct precipitation, and incoming groundwater) is 3870 ac-ft annually (**Figure 3-1**).

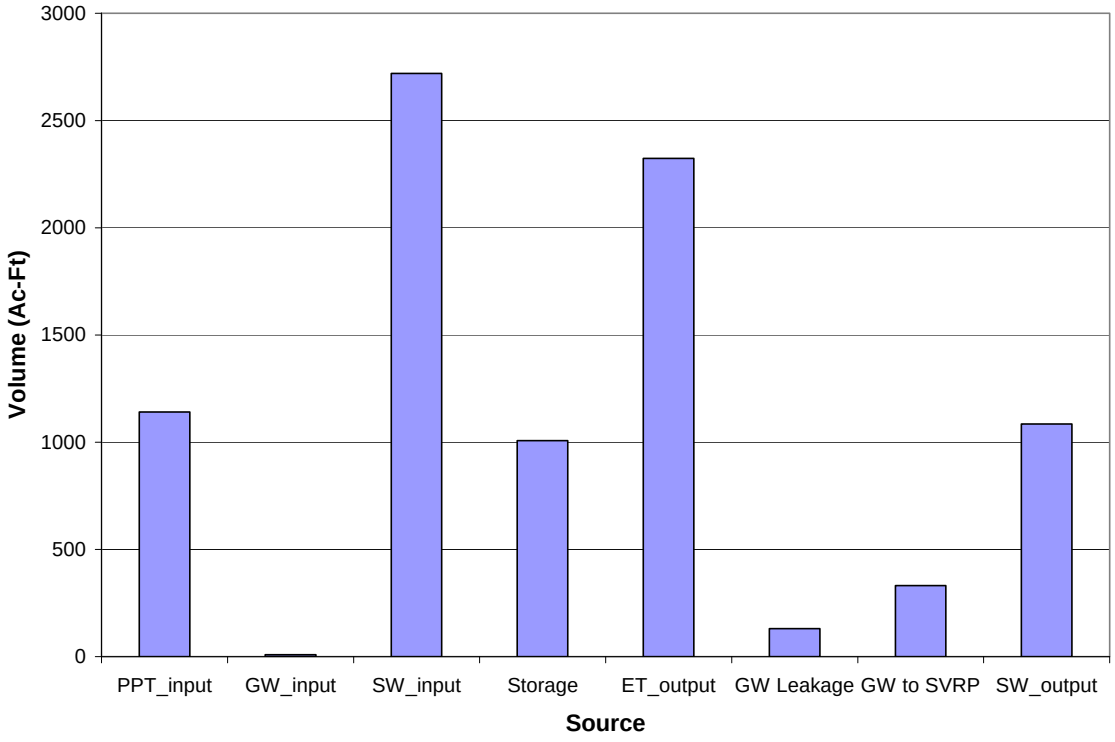


Figure 3-1. Water Budget Components for Average Year, Baseline Condition

Outputs

Evapotranspiration (ET) is estimated to be 2324 ac-ft annually. Vertical groundwater leakage from beneath Saltese Flats was estimated to be 130 ac-ft, and groundwater flux leaving the Flats to the northwest was estimated to be 330 ac-ft. The total outputs amount to 2784 ac-ft. These results suggest that there is a net water yield from the Flats of 1085 ac-ft in an average year. This corresponds to flows ranging from 0 to 5 cfs over the year.

Water storage in the Flats is a dynamic process and is an important factor in the timing of surface and groundwater outflows from the Flats. Water goes into storage in the spring as water tables rise, and is released from storage as the water table falls. This dynamic attenuates spring peak flows leaving the Flats, and potentially sustains flow as the spring peak subsides. This attenuation of flows may alter modeled surface and groundwater outputs from those presented in the water budget. As discussed previously,

storage in the Flats can be expected to result in a positive or negative 1152 ac-ft component in the water budget as the water table rises or falls 4 ft over the year.

Limitations

Existing flow and water yield information clearly present several contradictory findings, as well as variance with respect to the modeling effort. The predicted inflow values to Saltese Flats for the baseline scenario are significantly higher than inflows observed by PBSJ in 2009 monitoring events. A maximum instantaneous value of 14.6 cfs was observed in the field on 4/21/09 (**Section 2.6**). The model suggests that inflows should average from 12-15 cfs over two months in the spring. Thus inflows appear to be overestimated by the present modeling effort. Note that the contributing drainage area was reduced to 10 sq. mi. and nevertheless results in an apparent overestimate of inflows.

The modeled average annual water yield for inflows for the baseline condition totals 3870 ac-ft, and the outflow was estimated to be 1085 ac-ft. Note that this value is significantly lower than estimates developed by nearly all previous studies (**Table 2-7**). These previous estimates ranged from 17,000 to 20,000 ac-ft for inflow to the Flats, with the exception of the 2007 study. The present modeling results are more in line with the 2007 study and the observed flows in 2009, but conflict with earlier efforts.

Monitoring data in 2009 suggested that measured Saltese Flats inflows and water yields are actually lower than modeled results. Conversely, the Liberty watershed is about 7.6 sq. mi. and produces more than twice as much water as the adjoining 10 sq. mi Saltese drainage area. The same modeling technique applied to Liberty would underestimate observed flows, and overestimate Saltese flows. This would appear to be an unusual result given that the basins are physically similar.

Overall, the modeled values for Saltese surface water input appear appropriate, though the discrepancy with the adjoining Liberty Creek watershed is difficult to rationalize. Nevertheless, observed flows in the combined Saltese drainages had approximately 40% of the corresponding Liberty values on average. Thus calibration of modeling towards the observed Saltese values would seem to be appropriate. Because modeled values do appear to be high when compared to 2009 Saltese monitoring data, the baseline condition may be overly conservative for average runoff years. While this conservative approach does suggest limitations for potential reclaimed water application in the following scenarios, it also provides some assurance that modeled results will not be overly optimistic.

Scenario 2 (Dry Year)

The second scenario modeled expected results for a dry year, i.e. a series of monthly flows that would be expected only once in ten years on average. No field data is available as a calibration or benchmark. This water budget relies in large part on the validity of assumptions made in the baseline scenario, and also the inherent statistical validity and applicability of the equations for the monthly surface water flow measurements.

The modeled annual water yield for inflows for the dry condition totals 1585 ac-ft, the losses amounted to 2784 ac-ft, and the outflow to Shelley Lake was estimated to be -1174 ac-ft. This suggests a no-recharge condition for Shelley Lake, and implies a corresponding decline in the water level in the Flats of perhaps 4 feet.

Scenario 3 (Wet Year)

The third scenario modeled expected results for a wet year, i.e. a series of monthly flows that would be expected only once in ten years on average. Like the dry year scenario, no field data is available as a calibration or benchmark. This water budget relies in large part on the validity of assumptions made in the

baseline scenario, and also the inherent statistical validity and applicability of the equations for the monthly surface water flow measurements.

The modeled annual water yield for inflows for the wet condition totals 13064 ac-ft, the losses amounted to 2784 ac-ft, and the outflow to Shelley Lake was estimated to be 10,740 ac-ft. This suggests a recharge condition for Shelley Lake, and a corresponding inflow ranging from 5 to 44 cfs. The high values of 37 to 44 cfs exceed the documented infiltration rates for Shelley Lake, and imply that once in 10 years, flows exceeding the capacity of Shelley Lake are anticipated. Note that the "wet" scenario assumes 21 sq. mi. of contributing area, as opposed to 10 sq. mi. in the preceding scenarios. This modeled contributing area for wet year/high flow may be greater than actual area, and may over estimate surface water flow rates.

Scenario 4 (Average Year, 8 MGD)

Scenario 4 modeled expected results for an average year assuming the application of 8 MGD (i.e. 12.4 cfs) of reclaimed water over 7 months. No field data are available as a calibration or benchmark to verify potential outputs from the Flats with the addition of reclaimed water. The modeled results, shown on **Figure 3-2**, rely on the representativeness of the baseline scenario and assumptions about response of the system to applied water.

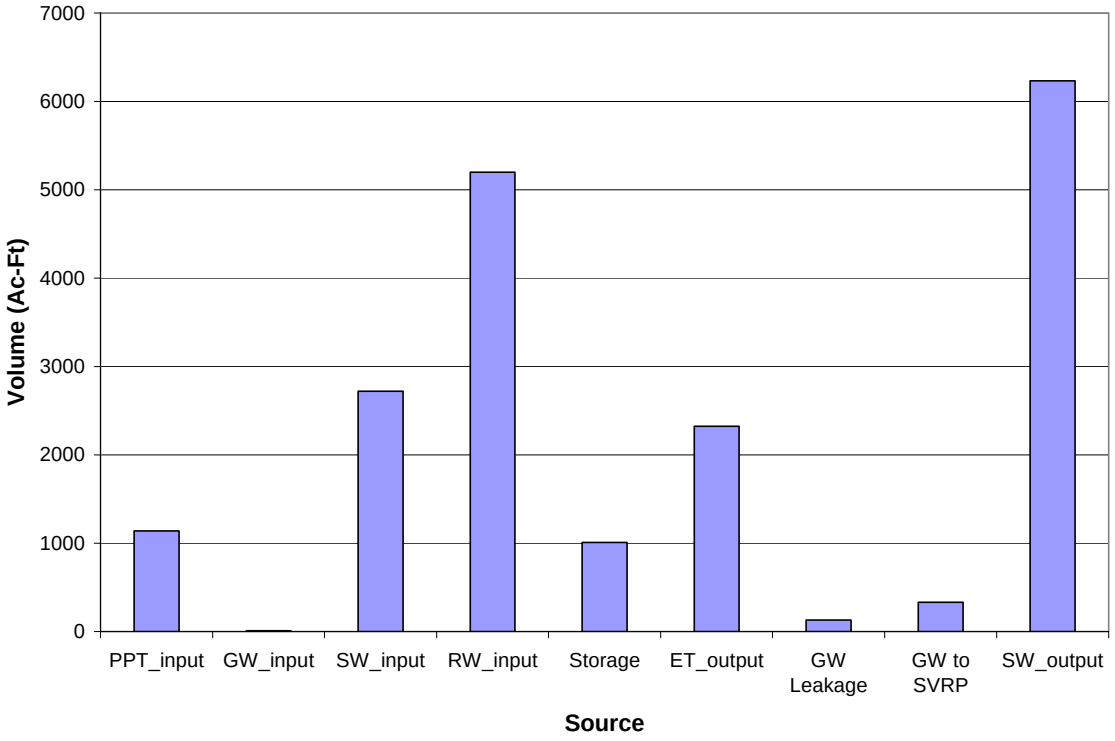


Figure 3-2. Water Budget Components for Average Year With 8MGD Reclaimed Water

The modeled annual water yield for inflows for the wet condition totals 3869 ac-ft, the losses amounted to 2784 ac-ft, and the outflow to Shelley Lake was estimated to be 6233 ac-ft. This suggests a recharge condition for Shelley Lake, and a corresponding inflow ranging from 0 to 23 cfs. Four months exceed 12 cfs, the expected upper limit of infiltration capacity for the lake. Two of the months are near the infiltration capacity of the lake, and two are greater than 20 cfs. This suggests that during two months in April and May, the applied reclaimed water scenario may exceed the infiltration capacity of the lake.

Scenario 5 (Average Year, 12 MGD)

Scenario 5 modeled expected results for an average year assuming the application of 12 MGD (i.e. 18.6 cfs) of reclaimed water over 7 months. Like the previous scenario, no field data are available as a calibration or benchmark to verify potential outputs from the Flats with the addition of reclaimed water. The modeled results rely on the baseline scenario and assumptions about response of the system to applied water.

The modeled annual water yield for inflows for the wet condition totals 3869 ac-ft, the losses amounted to 2784 ac-ft, and the outflow to Shelley Lake was estimated to be 8832 ac-ft. This suggests a recharge condition for Shelley Lake, and a corresponding inflow ranging from 0 to 23 cfs. Seven months exceed 12 cfs, the expected upper limit of infiltration capacity for the lake. Two of the months are near the infiltration capacity of the lake, and 5 are greater than 14 cfs. This suggests that during five months in April-June and Sept-Oct, the applied reclaimed water scenario may exceed the infiltration capacity of the lake.

Scenario 6 (Average Year, 14 MGD)

Scenario 6 modeled expected results for an average year assuming the application of 14 MGD (i.e. 21.7 cfs) of reclaimed water over 7 months. Like the previous scenarios, no field data are available to verify potential outputs from the Flats with the addition of reclaimed water and the modeled results rely on the baseline scenario and assumptions about response of the system to applied water.

The modeled annual water yield for inflows for the wet condition totals 3869 ac-ft, the losses amounted to 2784 ac-ft, and the outflow to Shelley Lake was estimated to be 10,132 ac-ft. This suggests a recharge condition for Shelley Lake, and a corresponding inflow ranging from 0 to 32 cfs. Seven months exceed 12 cfs, the expected upper limit of infiltration capacity for the lake. All 7 months during the reclaimed water application period are greater than 15 cfs. This suggests that throughout the reclaimed water application period, the applied reclaimed water scenario may exceed the infiltration capacity of the lake.

Scenario 7 (Wet Year, 14 MGD)

Scenario 7 modeled expected results for a wet year assuming the application of 14 MGD (i.e. 21.7 cfs) of reclaimed water over 7 months. This scenario is intended to represent a worst case, i.e. the application of the maximum reclaimed water in the wettest year.

The modeled annual water yield for inflows for the wet condition totals 10,380 ac-ft, the losses amounted to 2784 ac-ft, and the outflow to Shelley Lake was estimated to be 19,486 ac-ft. This suggests a recharge condition for Shelley Lake, and a corresponding inflow ranging from 4 to 85 cfs. Seven months exceed 12 cfs, the expected upper limit of infiltration capacity for the lake. All 7 months during the reclaimed water application period are greater than 22 cfs. This suggests that throughout the reclaimed water application period, the applied reclaimed water scenario will exceed the infiltration capacity of the lake.

Applied Reclaimed Water Scenarios 4-7

The applied reclaimed water scenarios suggest that the infiltration capacity of Shelley Lake may be exceeded from 2 to 7 months of the year. In average runoff years with 8 MGD of applied reclaimed water, the modeling results would indicate that flows must be diverted to the gravel pit at least a portion of the time, generally in spring (April-May). These predictions of flow to the gravel pit may overestimate the actual time flow reaches the gravel pit for several reasons. These have been discussed above, and are summarized below.

1) Modeling results for the average year suggest average peak surface water flows entering Saltese Flats that are greater than the field measurements made during this study. Thus the model may

also over-estimate the baseline inputs, and therefore overestimate outflows with reclaimed water application.

2) Groundwater flows leaving the Flats and lost to the SVRP are assumed to be constant under the baseline condition, and also the applied reclaimed water condition. This is unlikely to be the case as increased reclaimed water inputs are likely to result in increased groundwater outputs. At this time, data are unavailable to quantify the physical subsurface flow conditions at the north end of the Flats or how they may vary under applied reclaimed water scenarios
3) Surface water losses between the Flats and Shelley Lake are poorly understood, particularly at high flow conditions when losses to the SVRP are likely to increase significantly.
4) Irrigation withdrawal/consumptive use exists within the basin, and these have not been fully quantified. Golder reported a volume of 1875 ac-ft annually for existing surface water rights. Withdrawals of this amount are sufficient to influence conclusions about the length of time that outflows from applied reclaimed water scenarios may exceed the infiltration capacity of Shelley Lake.
5) The storage component in Saltese Flats is based on a maximum groundwater storage of 4 feet (i.e. the baseline condition). Data and field observations suggest that at least some areas of the Flat have the capacity to accommodate additional water as subsurface storage, and also as surface storage (i.e. ponded water, or natural wetland areas). Constructed wetland areas may also provide additional capacity.

Assuming that these unquantified additional losses which are not fully incorporated into the baseline scenario amount to 1500 ac-ft, and that storage may account for an additional 500 ac-ft, the 8 MGD scenario may not exceed the infiltration capacity of Shelley Lake in an average year. Dry years would also not be expected to exceed the capacity of Shelley Lake at 8 MGD. Because the water budget relies on numerous assumptions, many of which have not been verified with sufficient data, results presented in the above scenarios should be interpreted with caution.

Data Needs

1) Inflows to Saltese Flats, and the contributing drainage area in average or wet years is poorly understood at this time. The watershed area contributing to surface water flows within Saltese Flats was assumed to be 14,000 acres based on topography. The active watershed area for average conditions appeared to be much smaller in 2009 due to the absence of any measurable surface water input from the western half of the basin. This needs to be reviewed in more detail, and additional surface water flow observations are needed to better understand inflows. Inflows predicted by the model are higher than the actual flows measured during the one year of data collection for this study.

2) Groundwater measurements within the Flats have provided important information about storage capacity, but relatively little insight into how much water is leaving the Flats as groundwater underflow. Water leaving the Flats as groundwater is lost to the SVRP aquifer, and surface water leaving the Flats is largely delivered to Shelley Lake. Understanding groundwater losses from the Flats to the SVRP aquifer is important because for applied reclaimed water scenarios the groundwater component may be the deciding factor in determining the feasibility of implementing applied reclaimed water strategies.

3) Improving our understanding of losses along Saltese Creek on the way to Shelley Lake is important because losses along the Saltese creek channel may be significant. At present, we have few data to characterize this variable. In addition, manipulation of water within the Flats has complicated this analysis.

4) In addition to data needs above, the most robust approach to evaluate transient effects of storage, or simulate applied reclaimed water scenarios, is with a calibrated physical model. This requires additional data and relies on assumptions whenever no data are available. In this way it is similar to the water budget approach adopted for the present effort. However, the physical model offers many advantages in that it integrates all the assumptions and rigorously balances the inputs and outputs. The model can partition

surface and groundwater outflows and account for the dynamics of storage based on physical relationships. The water budget approach cannot reliably do this. Some consideration should be given to testing the assumptions of the water budget within a simplified physical model. Performing a sensitivity analysis to develop an improved understanding of water balance within the Flats, and potential input to Shelley Lake will be helpful to assess the viability of applied reclaimed water scenarios.

3.3 Shelley Lake and Gravel Pit Infiltration

In order to evaluate the feasibility of various restoration scenarios infiltration rates needed to be estimated for both Shelley Lake and for the gravel pit which serves as an emergency overflow for Saltese Creek near Shelley Lake. These estimates are presented below.

Shelley Lake

An initial estimate of infiltration rates from Shelley Lake was calculated to be between 15 and 222 cfs. The calculation was developed using an area of 853,776 ft^2, a hydraulic conductivity of 10 and 150 ft/d to provide a range, and assuming that 15% of the lake intercepts the zone of hydraulic conductivity. The last assumption is based on anecdotal evidence that the lake may have higher infiltration rates when levels are elevated, and little to no infiltration when the levels are low. The different infiltration rates may be due to a zone of higher hydraulic conductivity that is encountered when lake levels are high.

Revised Estimates Using Lake Level and Flow Measurement Data:

Shelley Lake elevation and Saltese Creek discharge data, shown on **Figure 3-3**, were used to further evaluate infiltration rates at Shelley Lake. Two specific points in time and two other time periods were selected and infiltration rates for those points and segments were calculated. These infiltration rate estimates are summarized in **Table 3-3**.

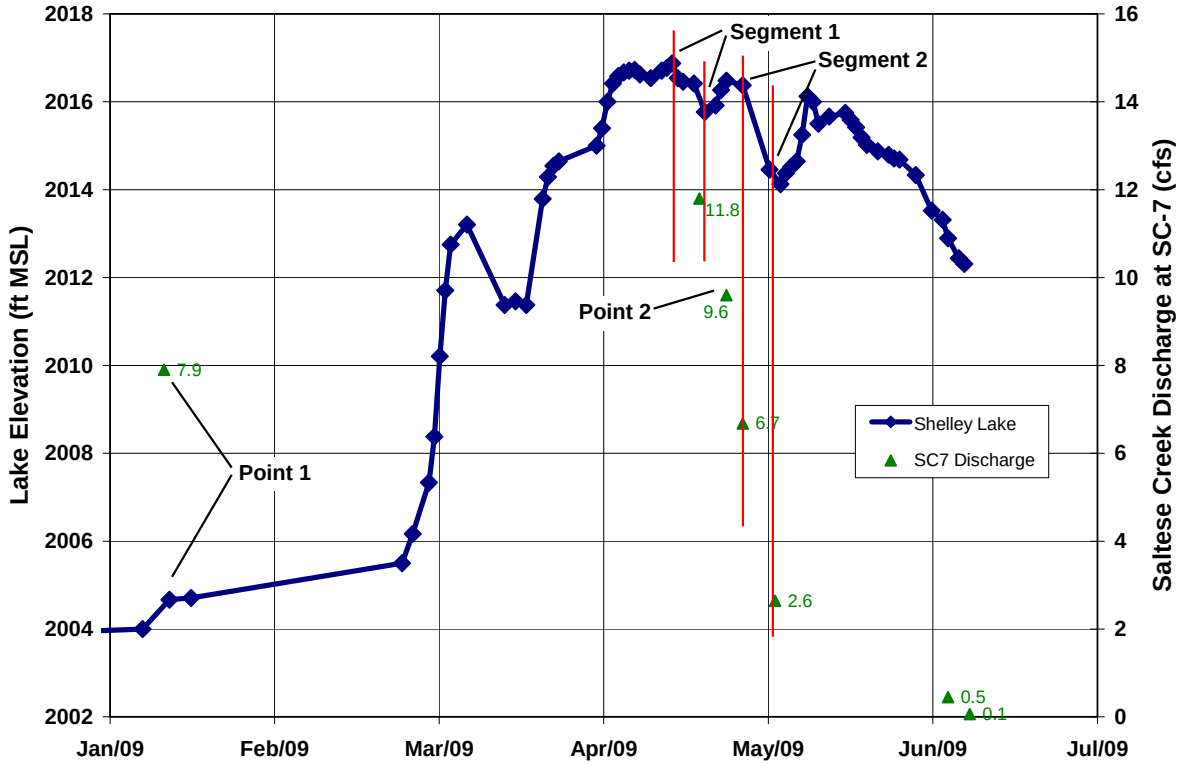


Figure 3-3. Plot of Data for Shelley Lake Infiltration Rate Estimates

Table 3-3. Summary of Shelley Lake Infiltration Rate Calculations

Segment	Max Elev (ft)	Min Elev (ft)	Decline (ft)	Period (d)	Flow Meas (cfs)	Avg Inflow (cfs)	Vol Loss (cfs)	Infilt Rate (cfs)
1	2016.88 04/16/09	2015.77 04/22/09	1.11	6	11.8 (4/21)	11.8	1.8	13.6
2	2016.38 04/29/09	2014.46 05/04/09	1.92	5	6.7 (4/29) 2.6 (5/5)	4.7	3.8	8.5

Point	Date	Inflow (cfs)	Lake Level
1	01/12/08	7.9	Stable
2	04/26/09	9.6	Slight Decline

- Line Segments 1: Lake levels were at their highest point and were dropping during this interval resulting in a volume loss rate of 1.8 cfs at the lake. However, Saltese Creek discharge near the end of the interval was estimated at 11.8 cfs and may have been higher previous to that time. Adding an assumed discharge rate of 11.8 cfs to the volume loss rate at the lake results in an estimated infiltration rate of 13.6 cfs.
- Line Segment 2: Lake levels were also near maximum during this interval and dropping. Saltese Creek discharge measured at the beginning and end of the interval were 6.7 and 2.6 cfs, respectively. Average discharge is estimated at 4.7 cfs, but based on the discharge trend may have been higher. The estimated infiltration rate for this time interval is 8.5 cfs.
- Points 1 and 2: Lake levels at these two points in time were relatively stable, suggesting the infiltration rate out the bottom of the lake and the inflow from Saltese Creek were in equilibrium. Saltese Creek discharge at these two times were 7.9 and 9.6 cfs.

In summary, the revised infiltration estimates for Shelley Lake range from 7.9 to 13.6 cfs, with an average value of about 10 cfs. This matches the lower end of the range for the preliminary infiltration calculations suggesting the hydraulic conductivity of the lake bed is much lower than that of the SVRP aquifer, likely as a result of sediment deposition in the lake. These estimates should be refined in the future with more frequent discharge measurements that would allow more accurate calculation of average inflow to the lake during declining lake level periods.

Gravel Pit

Initial estimates of potential infiltration rates for the overflow gravel pit were calculated to be between 91 and 272 cfs. The calculations are based on an area of 156,816 ft^2 and assumed hydraulic conductivity values of 50 and 150 ft/d to provide a range.

Water has not been routed to the gravel pit from Saltese Creek for a considerable time, possibly not since the overflow channel was excavated in the 1950's. Anecdotal information from that time indicates that the gravel pit was able to accommodate all of the flow routed during the flood event. Flow measurements were not taken at that time but based on the past years maximum flows in Saltese Creek the volume routed to the pit was likely well over 12 cfs.

For comparison, information was obtained from Ecology regarding infiltration rates in a borrow pit used for the Dishman-Mica road construction project. Infiltration rates for the pit were determined to be 280 and 660 inches per hour. Using the pit area noted above, this equates to infiltration rates greater than 1,000 cfs. These high rates of infiltration for gravel pits above the SVRP aquifer are supported by observations of rapid infiltration in pits near Chester Creek and Newman Lake, although no measured data are available for these locations.

Infiltration rates would likely be much lower than these estimates if the pit were to be used as in its current condition due to the presence of debris and compacted soils. In addition, it is likely that repeated use of the pit for overflow would result in sediment deposition and a lowering of the infiltration rate. However, if properly maintained, it appears based on these preliminary estimates that the pit would be capable of handling high rates of overflow.

4.0 RESTORATION FEASIBILITY SCREENING

This section presents a screening of the feasibility of the various restoration alternatives that have been identified. Each alternative was evaluated using a set of criteria to determine which alternatives are likely to be feasible and which ones are not. The alternatives that are determined to be feasible will be carried through into the next phase of this project which is to develop conceptual designs for those restoration scenarios.

4.1 Restoration Scenario Alternatives

The restoration feasibility has been evaluated for three main options that include restoring all of Saltese Flats or smaller portions (**Figure 1-3)**. Each of these three restoration options were evaluated considering natural conditions and using reclaimed water. Reclaimed water use was considered both seasonally (April-October) and year-round. Alternatives evaluated include:

1. Alternative A1: Option A area (342 acres), Natural Hydrology
2. Alternative A2: Option A area (342 acres), Reclaimed Water added year-round (8-14 mgd)
3. Alternative A3: Option A area (342 acres), Reclaimed Water added seasonally (8-14 mgd)
4. Alternative B1: Option B area (342+170 acres), Natural Hydrology
5. Alternative B2: Option B area (342+170 acres), Reclaimed Water added year-round (8-14 mgd)
6. Alternative B3: Option B area (342+170 acres), Reclaimed Water added seasonally (8-14 mgd)
7. Alternative C1: Option C area (1,200 acres), Natural Hydrology and Reclaimed Water

4.2 Screening Criteria

Alternatives were screened for feasibility using the following information:

- Results from water budgets – is there enough water for wetland restoration and is there too much water resulting in excessive flow to Saltese Creek?
- Results from surface and groundwater monitoring – does monitoring support water budget predictions?
- Land ownership and landowner issues – how many landowners, landowner attitudes toward wetland restoration?
- Recreation, education and wildlife issues – are there potential opportunities for establishing or enhancing these resources?

4.3 Option A Alternatives

Alternative A1: Option A area (342 acres), Natural Hydrology.

Under this option, Area A would be restored to wetland conditions under a natural hydrologic regime. Water budget projections presented in **Section 3.0** suggest that restoration under this alternative is feasible and there is sufficient water available for wetland maintenance. Surface and groundwater monitoring results were somewhat compromised by manipulation of the Morrison ditches during the monitoring period, however these results still suggest sufficient water available for wetland restoration. The property where this alternative is located is held by a single landowner. The current land owner has expressed a willingness to consider a wetland restoration project at this site. This alternative could also allow for significant recreation, education and wildlife opportunities.

Alternative A2: Option A area (342 acres), Reclaimed water added year-round.

Under this option, Area A would be restored to wetland conditions with the addition of reclaimed water year-round. The year-round option for reclaimed water use has been eliminated from further consideration at this time due to the potential for ice formation and flooding impacts during winter months. It would be possible to extend reclaimed water discharge at Saltese Flats into the winter period if on-going monitoring for icing conditions were used to determine discharge feasibility. It would also be possible to discharge reclaimed water during winter months if infiltration areas, ponds or other methods were used to reduce surface water discharge downstream of the Flats during icing periods.

Alternative A3: Option A area (342 acres), Reclaimed water added seasonally.

Under this option, Area A would be restored to wetland conditions with the addition of reclaimed water year-round. Water budget projections presented in Section 3.0 suggest that restoration under this alternative is feasible. Current water budget projections suggest that the addition of reclaimed water may result in significant surface flow to the gravel pit. However, uncertainty concerning several components of the water budget suggests that these flow estimates are high and that actual flows to the gravel pit are likely to be much lower and occur less often. Further refinement of the water budget needs to focus on surface water inputs, groundwater loss at the north end of Saltese Flats and groundwater loss from Saltese Creek. The property where this alternative is located is held by a single landowner. The current land owner has expressed a willingness to consider a wetland restoration project at this site. This alternative could also allow for significant recreation, education and wildlife opportunities.

4.4 Option B Alternatives

Alternative B1: Option B area (342+170 acres), Natural Hydrology.

Under this option, Area B would be restored to wetland conditions under a natural hydrologic regime. Water budget projections presented in Section 3.0 suggest that restoration under this alternative is feasible and there is sufficient water available for wetland maintenance. Surface and groundwater monitoring results were somewhat compromised by manipulation of the Morrison ditches during the monitoring period, however these results still suggest sufficient water available for wetland restoration. The property where this alternative is located is held by two landowners. Both current land owners have expressed a willingness to discuss a wetland restoration project at this site. This alternative could also allow for significant recreation, education and wildlife opportunities.

Alternative B2: Option B area (342+170 acres), Reclaimed water added year-round.

Under this option, Area B would be restored to wetland conditions with the addition of reclaimed water year-round. The year-round option for reclaimed water use has been eliminated from further consideration at this time due to the potential for ice formation and flooding impacts during winter months. It would be possible to extend reclaimed water discharge at Saltese Flats into the winter period if on-going monitoring for icing conditions were used to determine discharge feasibility. It would also be possible to discharge reclaimed water during winter months if infiltration areas, ponds or other methods were used to reduce surface water discharge downstream of the Flats during icing conditions.

Alternative B3: Option B area (342+170 acres), Reclaimed water added seasonally.

Under this option, Area B would be restored to wetland conditions with the addition of reclaimed water year-round. Water budget projections presented in Section 3.0 suggest that restoration under this alternative is feasible. Current water budget projections suggest that the addition of reclaimed water may result in significant surface flow to the gravel pit. However, uncertainty concerning several components of the water budget suggests that these flow estimates are high and that actual flows to the gravel pit are likely to be much lower. Further refinement of the water budget needs to focus on surface water inputs,

groundwater loss at the north end of Saltese Flats and groundwater loss from Saltese Creek. The property where this alternative is located is held by two landowners. Both current land owners have expressed a willingness to discuss a wetland restoration project at this site. This alternative could also allow for significant recreation, education and wildlife opportunities.

4.5 Option C Alternatives

Water budgets and other data suggest that there is the potential for wetland restoration, enhancement and creation projects within the Option C area outside of the Option A and B areas. These potential projects appear to be feasible under both natural hydrology and with the addition of reclaimed water. Further evaluation of these options will not be continued in this study due to the positive feasibility for completing a project on the smaller Option A and B lands and due to the much greater complexity of completing wetland projects outside the Option A and B lands. Wetland projects would be much more complex due to the large number of small landowners and the challenge of coordinating projects. Expressed interest in wetland projects among these landowners have varied from very positive to very negative. This does not preclude individual landowners or groups of landowners from developing wetland projects in the future. Further work on the Option A and B lands would provide additional data on which to base wetland restoration decisions for the Option C lands.

4.6 Preferred Restoration Alternatives

The preferred restoration alternatives that will be evaluated for conceptual designs during the next step of this project include:

1. Alternative A1: Option A area (342 acres), Natural Hydrology
2. Alternative A3: Option A area (342 acres), Reclaimed Water added seasonally (8-14 mgd)
3. Alternative B1: Option B area (342+170 acres), Natural Hydrology
4. Alternative B3: Option B area (342+170 acres), Reclaimed Water added seasonally (8-14 mgd)

4.7 Review of Washington State Reclaimed Water Use Standards

Scenarios modeled in the feasibility study using reclaimed water will be subject to provisions outlined in "Water Reclamation and Reuse Standards," Washington DOE Publication 97-23. This document outlines standards and practices for a variety of water reuse scenarios including discharge to wetlands, direct recharge of groundwater, surface water, and a variety of other uses.
Potential wetland enhancement and reclaimed water strategies for the Saltese Flats area will likely combine elements of several reuse practices. These include 1) application of reclaimed water to constructed and natural wetlands, 2) delivery of reclaimed and native surface water/groundwater to Shelley Lake, and in some circumstances, 3) recharge of potable aquifer via surface percolation at the gravel pit. Overall, the regulations are written for each of these components individually. A strategy employing a combination of these approaches could be expected to require additional Agency review. A brief summary of selected criteria are summarized below.

Key physical criteria include hydraulic loading rates and alteration of baseline water levels. Average annual rates vary from 2 cm/day to 5 cm/day unless net ecological benefits are maintained at higher loading rates.

Average monthly water levels are not to increase by more than 10cm relative to pre-augmentation baseline. Peaks may be limited to 15cm/6 times/yr with no excursion lasting more than 72 hours. Criteria may be more stringent in high quality bog or fen settings. These criteria may be modified if unacceptable changes to biological criteria will not occur, or net environmental benefits are obtained.

Reclaimed water applied to wetlands with human contact/recreational use must meet class A standards. For wetlands contiguous with a P-limited lake, mass loading rates of phosphorus may be an additional consideration for Shelly Lake. Additional requirements include meeting biological criteria and long term monitoring.

Aquifer recharge by surface percolation requires meeting groundwater recharge criteria. Parameter concentrations in reclaimed water higher than 50% of natural groundwater require a site specific hydrogeologic investigation in wetland settings to determine that groundwater is not degraded, and that quality of groundwater is fully protective of public health. Sampling and monitoring may be necessary to demonstrate compliance. The minimum pre-treatment standard for reclaimed water is Class A.

Water budget results suggest that application of reclaimed water will be partially retained in restored wetlands during low flow periods. Some outflow to the SVRP aquifer is anticipated via subsurface discharge to the north of the Flats, along Saltese Creek, and potentially to Shelley Lake. During elevated flow months, reclaimed water will comingle with Saltese Flats surface water and groundwater and be discharged to Shelly Lake and the SVRP along Saltese Creek. The water budget further suggests that higher peak flow conditions may result in co-mingled native water and reclaimed water being delivered to the SVRP aquifer via Saltese Creek, Shelley Lake and also the gravel pit.

Depending on flow rates, reclaimed water co-mingled with native water may be expected to be regulated under both wetland and surface percolation standards. It is unclear whether Shelly Lake could be considered a lake subject to phosphorus mass loading standards, or if it would be considered a surface percolation recharge scenario. Because reclaimed water is expected to improve water quality in Shelly Lake, phosphorus mass loading may not be a limiting factor. The gravel pit might be treated as a surface percolation groundwater recharge scenario by DOE. However, comprehensive review of the project by DOE may consider Saltese Flats to be the project area and point of compliance. It is possible that both the gravel pit and Shelly Lake would not be directly subject to reclaimed water standards. The proposed project would require evaluation by DOE to determine the applicability of the statutes.

Several numerical criteria may be difficult to achieve if strictly applied. For example, depending on the modeled scenario, water level variance may periodically exceed numerical criteria for wetlands. Project scenarios include a mix of constructed and enhanced natural wetland areas. The entirety of the project will need to be evaluated by DOE to assess design water levels and operating parameters. Because reclaimed water would also be comingled with native water prior to delivery to the SVRP, Shelley Lake, or gravel pit, some modification to criteria might be anticipated. For example, the Class A reclaimed water is likely to be of higher quality than native water for some or perhaps many parameters. It may be reasonable for water quality standards or monitoring approaches to be modified to reflect the inherently different characteristics of native water.

Probably the most important guiding principal is that in general the standards make provisions for modification of most criteria on a case-by-case basis provided that no unacceptable changes to biological criteria occur, or that net environmental benefits are obtained, potable water supplies are maintained, etc. A comprehensive analysis will be required to demonstrate that application of reclaimed water results in no degradation of water quality and results in net environmental benefits.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Data has been gathered over the past year to supplement previously documented existing information. These new data are of both a site-specific (Saltese Flats) and regional nature and were collected under the Monitoring Program, as part of recommendations in the *Existing Data Review* report (PBS&J, 2009), or discovered as work on this investigation has progressed. The data collection has been completed to develop an understanding of current, or baseline conditions, and to assist in the evaluation of potential restoration alternatives.

The feasibility of potential wetland restoration alternatives, including options using only natural conditions and ones including the use of reclaimed water, has been evaluated. Restoration scenarios have been described, with detail provided on water budgets and management alternatives, and screened for feasibility.

Four wetland restoration alternatives have been identified for further evaluation in the conceptual design phase of this project. Our current level of understanding of site conditions indicate that each of these four alternatives are feasible. However, some additional work has been identified as necessary to refine the water budgets developed and further define the hydrologic feasibility of these alternatives. Most important is evaluation of surface water inputs, groundwater losses at the north end of Saltese Flats and groundwater losses from Saltese Creek between the Flats and Shelly Lake. Despite the need for additional data collection, all restoration alternatives identified at this time appear to have a high confidence of feasibility.

Additional work identified as being necessary to further refine the restoration alternatives include:

1. Extension/Modification of the Monitoring Program: Continuing the Monitoring Program for an additional year, with modifications to some of the locations, is essential for a sufficient understanding of baseline conditions and for improvements to the developed water budgets. As noted, additional discharge measurements will be needed to improve the accuracy of rating curves and some sites may need to be abandoned or relocated because flow measurements have been difficult (**Section 2.6**). The additional flow measurements will also be necessary to refine the estimated watershed area (**Section 3.2**) and to improve the comparison with the nearby Liberty Creek drainage (**Section 2.6**), refine water budget estimates (**Section 3.0**), and enhance understanding of infiltration rates out of Shelley Lake (**Section 3.3**). Additional groundwater level measurements will better define high and low water conditions and the nature of seasonal groundwater fluctuations at the site (**Section 2.8**);

2. Gravel Pit Infiltration: As noted in **Section 3.3**, potential infiltration rates for the gravel pit near Shelley Lake have been estimated based on field tests from other locations. Infiltration testing at the gravel pit will help verify the ability of the pit to handle the volume of water from the Flats predicted under some of the restoration scenarios;

3. Groundwater Conditions at Flats Outlet. Uncertainty remains regarding the nature of groundwater flow out the northern portion of the Flats. Improved knowledge of the geology and groundwater conditions in that area will allow better estimates of the volume of groundwater discharge from the Flats and its interaction with the SVRP aquifer. It is recommended that additional studies be conducted in two phases. The first phase would involve field verification and location of existing wells along with a geophysical survey to delineate the geology. The second phase, if deemed necessary, would include drilling and installing monitoring wells at and near the outlet and conducting pumping tests to determine aquifer parameters for groundwater flow estimates;

4. Saltese Creek Infiltration. The amount of water loss through the bed of Saltese Creek between the Flats and Shelley Lake is not well quantified as noted in **Section 3.2**, with estimates based on

a single pair of flow measurements. Additional flow measurements from the extended Monitoring Program may improve those estimates. Alternatively, infiltration testing would be able to give more reliable estimates of stream bed loss. Testing would involve sealing off portions of the creek, introducing water, and recording the rate of infiltration through the creek bed;

5. Additional Survey Work. As indicated in **Section 2.1**, additional surveying will likely be necessary along Saltese Creek in particular where the overflow channel splits off to the gravel pit near Shelley Lake. Better definition of the maximum Shelley Lake level will also be necessary which may also include surveying along the lake shore.

6. No Degradation Analysis. A comprehensive analysis will be required to demonstrate that application of reclaimed water results in no degradation of water quality and results in net environmental benefits (**Section 4.7**); and

7. FEMA Map Discrepancy. Several flaws have been identified in the recent FEMA floodplain map that may impact the permitting process. These flaws include a discrepancy in the flood elevation and the omission of the Steen Road gravel pit and over-flow channel linking it to Saltese Creek (**Section 2.1**). A review and correction of these flaws is recommended.

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Appendix A

Topographic Maps

Figure A-1. Topographic Map of the Northern Saltese Flats Using Ducks Unlimited Survey Data

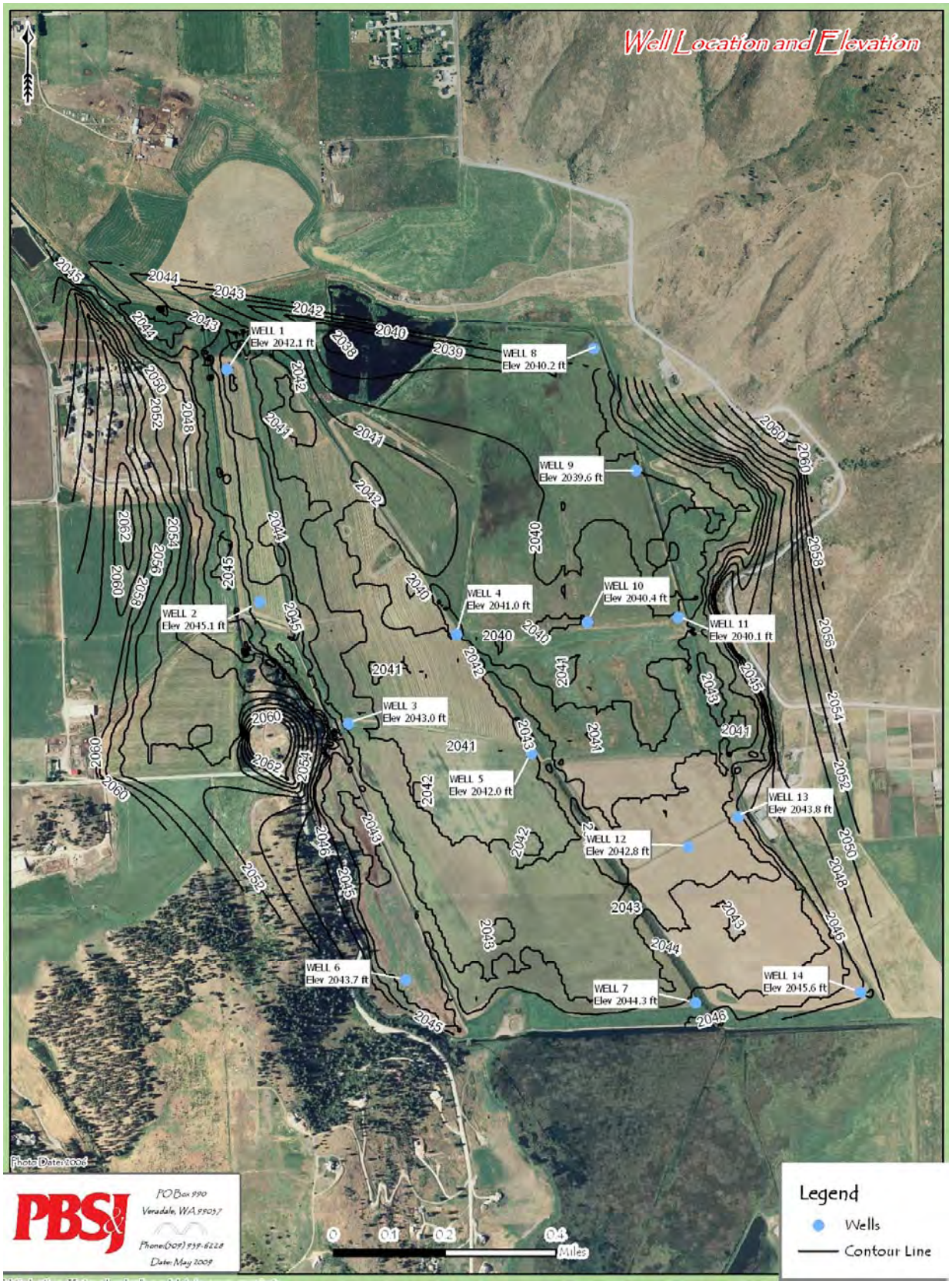


Figure A-2. Shallow Monitoring Well Locations and Elevations Based on Spokane County Survey Data and Topographic Contours Based on Ducks Unlimited Survey Data

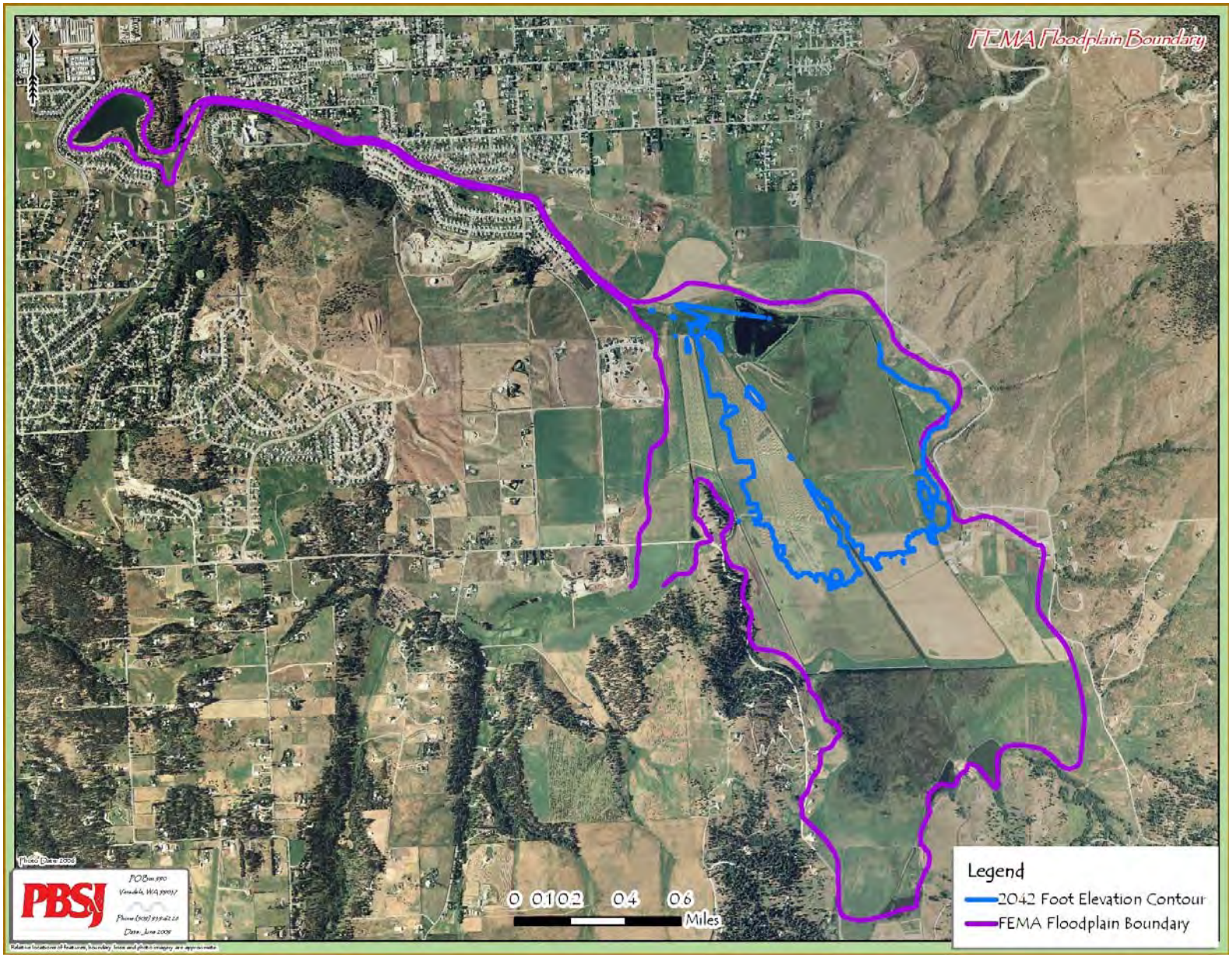


Figure A-3. New FEMA Floodplain Map for the Saltese Flats to Shelley Lake Area and the 2042 foot Contour Line Using Ducks Unlimited Survey Data

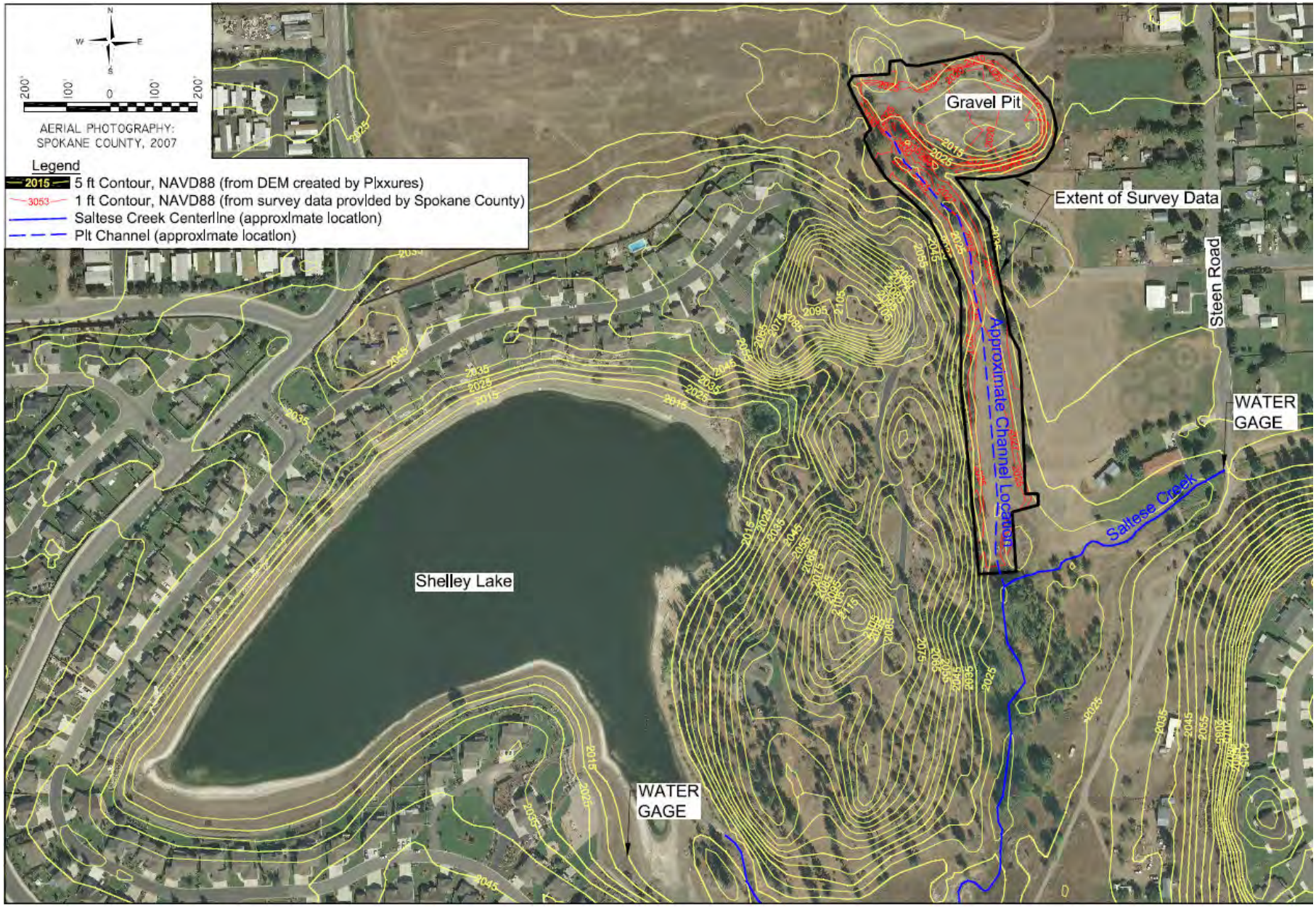


Figure A-4. Shelley Lake, Saltese Creek, and Gravel Pit Topographic Contours

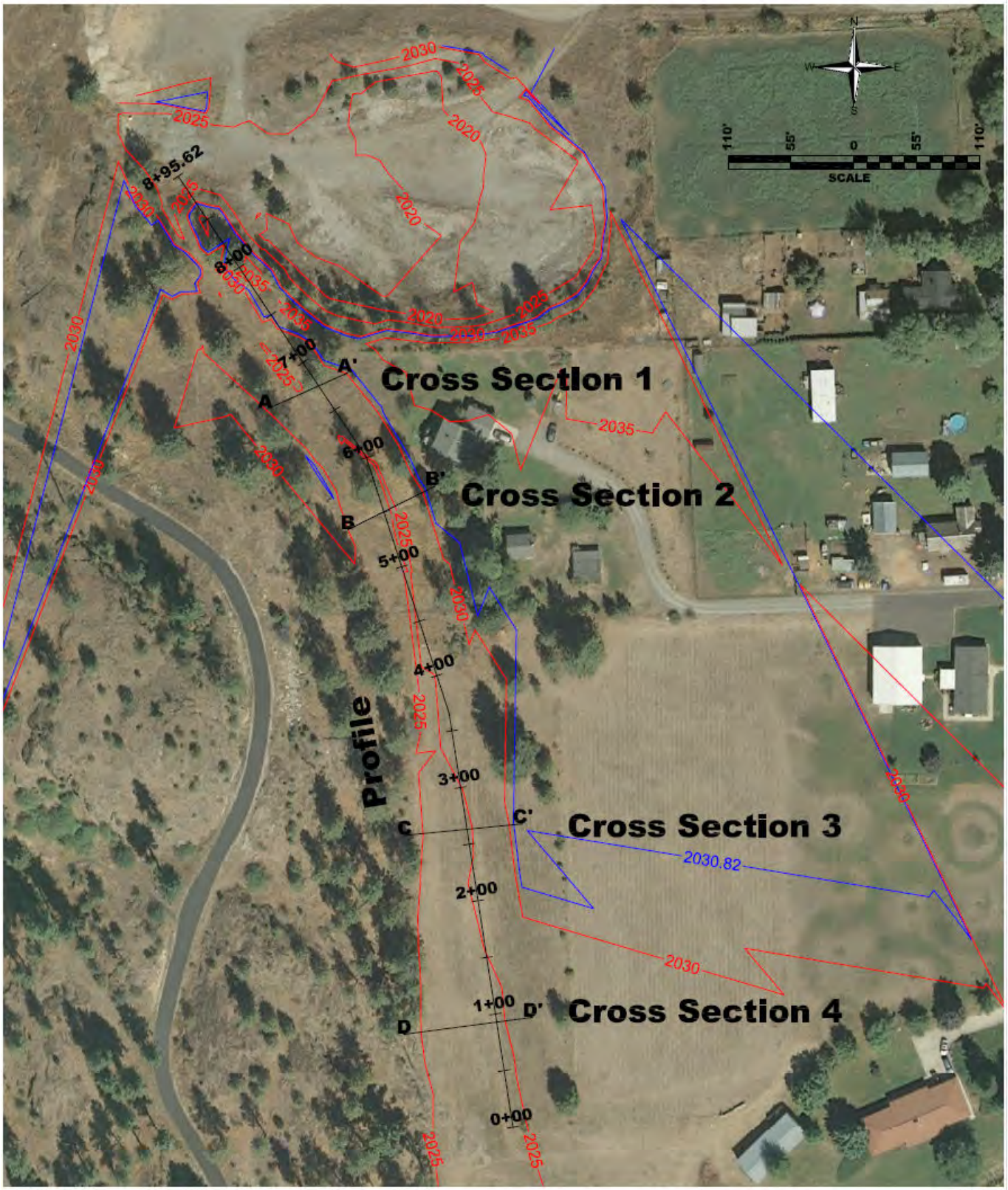


Figure A-5. Overflow Channel and Gravel Pit Topography

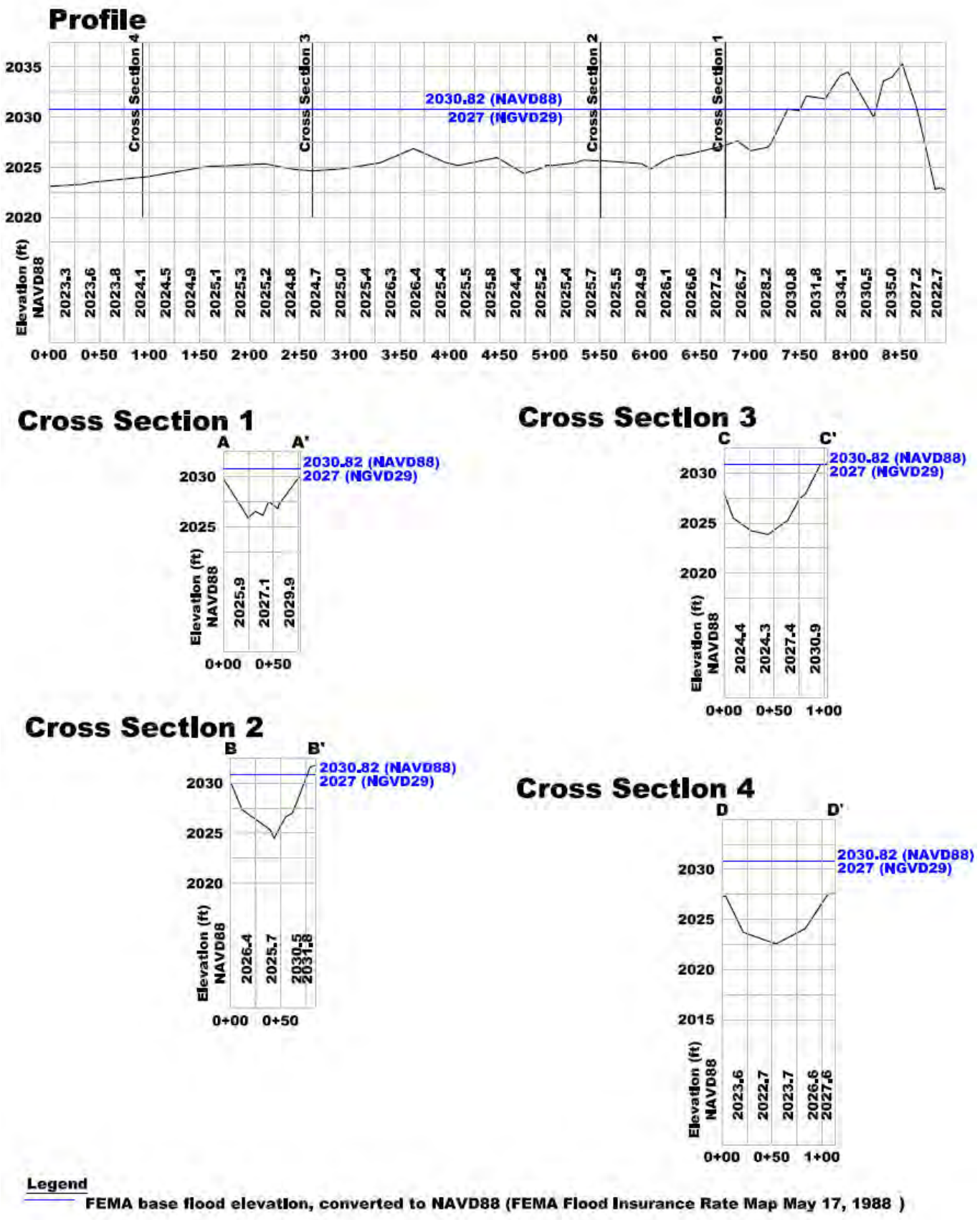


Figure A-6. Overflow Channel Cross-Sections

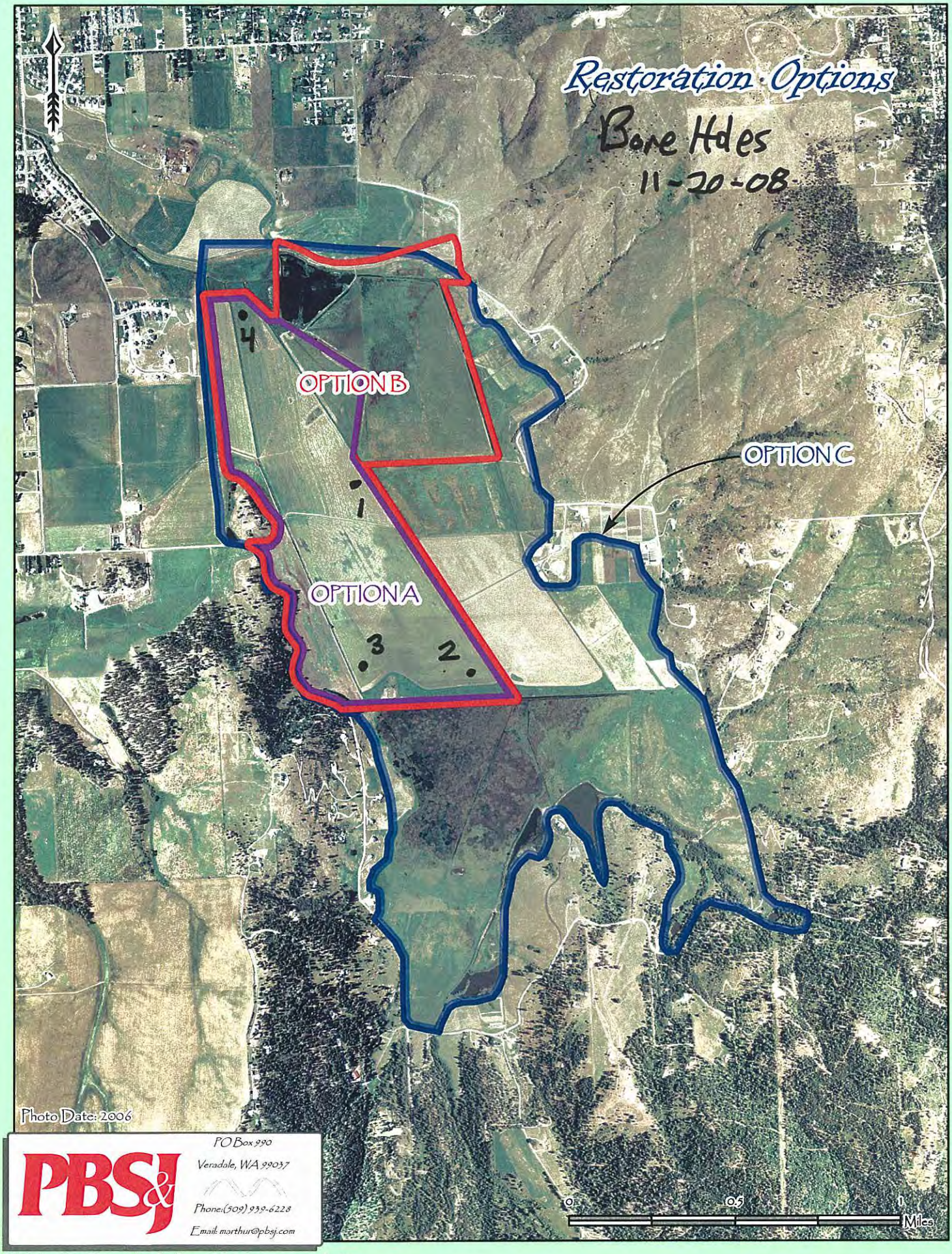
Appendix B

Example Photographic Documentation

Figure B-1. Proposed East Side Visualization View: View from Location 14 of the Potential Project Area from the East Side of the Flats

Figure B-2. Proposed West Side Visualization View: View from Location 16 of the Potential Project Area from the West Side of the Flats

Appendix C
Soil Boring Logs



PBS&J
PO Box 990
Veradale, WA 99037
Phone: (509) 939-6228
Email: marthur@pbsj.com

Relative locations of features, boundary lines and photo imagery are approximate.

Boring Log

Project Name: SALTESE	L&W Personnel: BD	Dates Drilled: 11-20-08
Location: Middle of Flat	Boring No: B1	Ground Elev: 2040 (map)
Project No:	Total Depth:	TOC Elev:
Drilling Company/Driller: Budinger	SWL:	Loc Sketch:
Drilling Mthd: Geoprobe/Trackhoe	Measuring Point:	
Sampling Mthd: Plastic Sleaves	Well Type:	

DEPTH (Ft)	MATERIAL DESCRIPTION	COMMENTS
0-8	Organic Muck	Histic Epipedon → Histosol
	Dark Brown	
8-10	Very fine sand	
	Light Gray	
10-20	Medium Sand	May have saturated sand flowing
	Gray	into hole
20-25	Medium to Coarse Sand	

PBSJ

Recovery in each 4' Section

1, 2.5, 1, 2.5, 1

Page ____ of ____

Boring Log

Project Name: SALTESE	L&W Personnel: BD	Dates Drilled: 11-20-08
Location: South Option A	Boring No: B2	Ground Elev:
Project No: 1	Total Depth:	TOC Elev:
Drilling Company/Driller: Badger	SWL:	Loc Sketch:
Drilling Mthd:	Measuring Point:	
Sampling Mthd:	Well Type:	

DEPTH	MATERIAL DESCRIPTION	COMMENTS
0-11	Organic Muck	
	Dark Brown	
11-16	Medium Sand	Harder to push at sand layer then
	Light Gray	easier about 14 feet
16-23	Organic Muck	
23-33	Silt + Very Fine Sand	
	Gray	

PBS&J

Boring Log

Project Name: SALTESE	L&W Personnel: BD	Dates Drilled: 11-20-08
Location: SW corner Option A	Boring No: B3	Ground Elev:
Project No:	Total Depth:	TOC Elev:
Drilling Company/Driller:	SWL:	Loc Sketch:
Drilling Mthd:	Measuring Point:	
Sampling Mthd:	Well Type:	

DEPTH	MATERIAL DESCRIPTION	COMMENTS
0-5	Organic Muck	
	Dark Brown	1 Foot of material recovered from
5-10	Fine Sand	top 9 feet (8" organic 4" Fine Sand)
	Gray	
10-18	Organic Muck	
	Brown	
18-21	Silt & Very Fine Sand	
	Gray	
21-	Fine sand	
	Gray	

PBS&J

Boring Log

Project Name: SaHse	L&W Personnel: BO	Dates Drilled: 11-20-08
Location: NW Corner Optima A	Boring No: B4	Ground Elev:
Project No:	Total Depth:	TOC Elev:
Drilling Company/Driller:	SWL:	Loc Sketch:
Drilling Mthd:	Measuring Point:	
Sampling Mthd:	Well Type:	

DEPTH	MATERIAL DESCRIPTION	COMMENTS
0-10	Organic Muck	
	Dark Brown	
10-15	Fine-Med Sand	
15-25	Organic Muck	
25-30	Coarse Sand	

PBSJ

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

Copy to K.F.O. - #7 - 99206 - H. Casey

WATER WELL REPORT

STATE OF WASHINGTON

Application No. .....

Permit No. .....

(1) OWNER: Name Jargens, Casey, Smith, et al Address Spokane Co.

LOCATION OF WELL: County Spokane SE ¼ NW ¼ Sec 33 T 25 N., R 45 E W.M.

ng and distance from section or subdivision corner 200 E. N & 200 FE of SEC. C.L.

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☑ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) .....

New well ☐ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☑ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 242 ft. Depth of completed well 241 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 6 " Diam. from 0 ft. to 224 ft.
Threaded ☐ ..... " Diam. from ..... ft. to ..... ft.
Welded ☑ ..... " Diam. from ..... ft. to ..... ft.

Perforations: Yes ☐ No ☑
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☐ No ☑
Manufacturer's Name .....
Type ..... Model No .....
Diam. ..... Slot size ..... from ..... ft. to ..... ft.
Diam. ..... Slot size ..... from ..... ft. to ..... ft.

Gravel packed: Yes ☐ No ☑ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☑ No ☐ To what depth? 25 ft.
Material used in seal BENT
Did any strata contain unusable water? Yes ☑ No ☐
Type of water? BRACKISH Depth of strata 180 TO 205
Method of sealing strata off PIPE

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level..... ft.
Static level ..... ft. below top of well Date .....
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by .....
(Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? .....
Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.
" " " " "
" " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Bailer test ..... gal./min. with ..... ft. drawdown after ..... hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Top Soil - Black	0	3
Peat Moss - Black	3	18
Peat & Clay - Drk. Brn.	18	24
Clay - Blue - Soft	24	40
" " "	40	50
Sand - Fine - Water	50	62 Water
Granit Sand - Med. Fine	62	79
Granit Rock Flour	79	100
" " "	100	110
Granit Gravel & Sand	110	150
" "	150	153
Clay - Soft - Brown	153	162
Fine Sandy Clay - Brown	162	170
Sandy Clay - Grey	170	180
Sandy Clay Lt. Brn. Very Fine	180	183
Sand Med. Fine - Some Gravel	183	190 Water
Coarse Sand - Water	190	200
Sand V. Fine - Brown	200	210
Sand Gray - V. Fine	210	224
" "	224	232
Sandy "Mud" - White	232	242

Pipe Scedual
21' - 21'
20' - 20'
6' - 7' - 7' 9"
6' 6" 7' 6"

RECEIVED
DEC 16 1977
DEPARTMENT OF ECOLOGY
SPOKANE REGIONAL OFFICE

Work started 1-20, 1977. Completed 2-9, 1977

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME B & B Co
(Person, firm, or corporation) (Type or print)

Address 11924 E Sprague

[Signed] G. Bonander
(Well Driller)

License No. 0033 Date 2-10, 1977

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20

8/1/17

Appendix D

Analytical Data and Laboratory Reports

Table D-1. SVRP Wells Water Quality Data Summary

Project ID:	DW-2					DW-3							
Spok Co ID:	5426L01					5518R01							
Well Name:	Vera Water & Power Well 4					Consolidated Irrig. Dist, Site 2A							
Sample Date:	01/30/07	01/30/07	07/31/07	07/31/07		01/03/07	04/24/07	07/31/07	10/30/07	01/29/08	04/29/08	07/29/08	10/21/08
Parameter	**Unit**	**Standard[1]**											
Conductivity	uS/cm		305		406			143	142	159	142	148	146	152	160
Water Temperature	C		11.1		14.2			12.3	13.3	14.9	13.2	12.3	12.9	14.2	13.0
pH	s.u.		7.61		7.90			8.40	8.60	8.47	8.49	8.26	8.58	8.57	8.28
Arsenic (As)	mg/L		0.004	0.004	0.004	0.004		0.001	0.001	0.001	0.003	<0.00165	<0.00165	<0.00165	<0.00165
Cadmium (Cd)	mg/L	0.01	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
Calcium (Ca)	mg/L		40.90	40.70	50.90	52.90		20.50	19.30	20.70	36.00	18.70	15.50	20.60	21.50
Copper (Cu)	mg/L	1.0	0.00479	0.0293	0.00182	0.00153		<0.001	0.00109	<0.001	0.00238	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	0.30	**0.50300**	**0.49700**	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	<0.08	<0.08	<0.08	<0.08
Lead (Pb)	mg/L	0.05	<0.001	0.00301	<0.001	<0.001		<0.001	0.00164	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L		12.4	12.2	14.0	14.5		4.9	4.7	5.2	11.1	4.46	3.79	4.87	5.27
Mercury (Hg)	mg/L	0.002	<0.0005	<0.0005	<0.0002	<0.0002		<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (Ni)	mg/L														
Potassium (K)	mg/L		2.3	2.3	2.8	2.9		1.1	1.2	1.2	2.1	1.09	1.01	1.22	1.26
Sodium (Na)	mg/L		4.86	4.77	6.59	6.80		2.10	2.10	2.11	5.08	2.09	1.82	2.26	2.47
Zinc (Zn)	mg/L	5.0	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hardness	mg/L														
Ammonia as N	mg/L														
Total Kjeldahl Nitrogen (TKN)	mg/L														
Total Phosphorous (P)	mg/L		0.0212	<0.02	0.0337	<0.06		<0.02	<0.02	<0.06	0.019	0.05	0.003	0.004	0.004
Bicarbonate (HCO3)	mg/L		132.0	135.0	181.0	178.0		67.3	64.5	71.9	133.0	66.6	65.3	74.8	78.9
Carbonate (CO3)	mg/L		<2	<2	<2	<2		<2	<2	<2	2.17	<1	<1	<1	<1
Chloride (Cl)	mg/L	250	4.95	5.55	9.13	8.84		2.34	2.52	3.45	3.72	1.94	1.85	2.31	3.73
Nitrate	mg/L	10													
Nitrite	mg/L	1													
Nitrate + Nitrite	mg/L		1.55	1.60	2.90	2.91		0.51	0.49	0.56	1.37	0.55	0.45	0.68	0.82
Sulfate (SO4)	mg/L	250	9.9	10.0	14.6	14.2		5.4	5.1	5.9	10.2	5.05	5.48	6.38	6.06
Alkalinity	mg/L														
Total Dissolved Solids	mg/L	500	187.0	195.0	245.0	238.0		106.0	84.0	90.0	168.0	69.0	77.0	91.0	73.0
Total Suspended Solids	mg/L														
Total Persulfate Nitrogen (TPN)	mg/L														
Orthophosphate (OPO4)	mg/L		0.016	0.009	0.018	0.021		0.006	0.008	0.006	0.007	0.003	0.002	0.002	0.003
Biochemical Oxygen Demand (BOD)	mg/L														
Fluoride	mg/L		<0.1	0.100	0.100	0.100		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	mg/L		<0.001	0.00102	0.00123	<0.001		<0.001	<0.001	<0.001	<0.001	<0.0025	<0.0025	<0.0025	<0.0025
Manganese	mg/L		<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001

Note: Well Failure, Can No Longer Be Sampled

1 Ecology Groundwater Criteria per WAC 173-200-040
red=secondary standards
Bold/gray values exceed standard

Table D-2. SVRP Wells Water Quality Data Summary (Contd)

	Project ID:		DW-4								
	Spok Co ID:		5517D05								
	Well Name:		Mission & Barker MW at CID 4								
	Sample Date:		02/06/07	04/25/07	04/25/07	08/06/07	10/22/07	01/21/08	05/12/08	08/11/08	11/03/08
Parameter	Unit	Standard[1]									
Conductivity	uS/cm		94	107		65	101	108	110	102	93
Water Temperature	C		14.4	14.8		17.3	13.2	9.8	14.5	14	12
pH	s.u.		7.30	7.47		7.24	7.27	7.43	7.69	7.09	6.39
Arsenic (As)	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.00165	0.00270	<0.00165	0.00301
Cadmium (Cd)	mg/L	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
Calcium (Ca)	mg/L		11.00	12.20	12.50	11.70	11.00	12.70	11.30	10.90	10.10
Copper (Cu)	mg/L	1.0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L	0.30	0.04560	<0.02	<0.02	<0.02	<0.02	<0.06	<0.06	<0.06	<0.06
Lead (Pb)	mg/L	0.05	<0.001	0.00207	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L		3.8	4.3	4.4	4.1	3.7	4.03	3.78	3.79	3.47
Mercury (Hg)	mg/L	0.002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (Ni)	mg/L										
Potassium (K)	mg/L		1.0	1.1	1.1	1.0	1.0	1.13	0.99	1.10	0.92
Sodium (Na)	mg/L		1.97	2.00	2.06	1.93	1.78	2.05	2.15	1.85	1.82
Zinc (Zn)	mg/L	5.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hardness	mg/L										
Ammonia as N	mg/L										
Total Kjeldahl Nitrogen (TKN)	mg/L										
Total Phosphorous (P)	mg/L		<0.02	<0.02	<0.02	0.0646	0.0170	0.03	0.003	0.005	0.0040
Bicarbonate (HCO3)	mg/L		40.0	47.4	44.9	44.9	49.8	42.9	45.1	47.4	44.1
Carbonate (CO3)	mg/L		<2	<2	<2	<2	<2	<1	<1	<1	<1
Chloride (Cl)	mg/L	250	2.59	1.82	1.86	2.28	2.11	1.67	1.99	1.44	1.38
Nitrate	mg/L	10									
Nitrite	mg/L	1									
Nitrate + Nitrite	mg/L		0.40	0.69	0.70	0.38	0.57	0.50	0.91	0.42	0.44
Sulfate (SO4)	mg/L	250	4.9	4.9	5.0	4.8	5.0	4.71	7.75	5.99	4.49
Alkalinity	mg/L										
Total Dissolved Solids	mg/L	500	68.0	87.0	**896.0**	57.7	65.4	72	85	55	36
Total Suspended Solids	mg/L										
Total Persulfate Nitrogen (TPN)	mg/L										
Orthophosphate (OPO4)	mg/L		0.005	0.004	0.004	0.003	<0.002	0.003	0.003	0.002	0.001
Biochemical Oxygen Demand (BOD)	mg/L										
Fluoride	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	mg/L		<0.001	<0.001	<0.001	0.00144	<0.001	<0.0025	<0.0025	<0.0025	<0.0025
Manganese	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001

1 Ecology Groundwater Criteria per WAC 173-200-040
red=secondary standards

Bold/gray values exceed standard

Table D-3. SVRP Wells Water Quality Data Summary (Contd)

	Project ID:	DW-5								
	Spok Co ID:	5515C01								
	Well Name:	Liberty Lake S&W Mission Well								
	Sample Date:	01/30/07	04/24/07	04/24/07	07/31/07	10/30/07	01/29/08	04/29/08	07/29/08	10/21/08
Parameter	Unit	Standard[1]								
Conductivity	uS/cm		265	225		269	213	193	264	239	275
Water Temperature	C		10.8	12.1		15.3	12.4	9.6	12.4	16.6	12.4
pH	s.u.		8.01	8.13		8.03	7.82	8.06	8.10	8.07	7.87
Arsenic (As)	mg/L		0.003	0.004	0.003	0.003	<0.001	<0.00165	0.00263	0.00249	0.00271
Cadmium (Cd)	mg/L	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
Calcium (Ca)	mg/L		34.40	40.10	28.90	34.70	19.30	23.90	28.10	28.90	34.50
Copper (Cu)	mg/L	1.0	0.00332	0.00223	0.00186	0.0029	<0.001	0.00134	0.00206	0.00225	0.00101
Iron (Fe)	mg/L	0.30	<0.02	0.03570	<0.02	<0.02	<0.02	<0.06	<0.06	<0.06	<0.06
Lead (Pb)	mg/L	0.05	<0.001	0.00176	0.00175	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L		11.6	16.4	8.6	10.7	4.7	6.46	10.00	8.8	10.7
Mercury (Hg)	mg/L	0.002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel (Ni)	mg/L										
Potassium (K)	mg/L		1.7	2.3	1.8	1.9	1.2	1.28	1.67	1.77	2.02
Sodium (Na)	mg/L		3.27	4.36	4.37	4.64	2.08	2.60	3.04	4.53	5.31
Zinc (Zn)	mg/L	5.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hardness	mg/L										
Ammonia as N	mg/L										
Total Kjeldahl Nitrogen (TKN)	mg/L										
Total Phosphorous (P)	mg/L		0.0176	<0.02	<0.02	<0.06	0.0090	0.01	0.013	0.009	0.010
Bicarbonate (HCO3)	mg/L		127.0	149.0	99.4	124.0	63.4	85.6	126.0	111.0	137.0
Carbonate (CO3)	mg/L		<2	<2	<2	<2	<2	<1	<1	<1	<1
Chloride (Cl)	mg/L	250	3.65	5.55	3.32	4.48	2.28	1.67	4.28	2.63	4.21
Nitrate	mg/L	10									
Nitrite	mg/L	1									
Nitrate + Nitrite	mg/L		1.45	1.83	1.50	6.61	0.49	0.92	1.27	1.36	1.72
Sulfate (SO4)	mg/L	250	9.4	13.8	7.1	10.7	5.4	6.29	9.96	8.94	11.10
Alkalinity	mg/L										
Total Dissolved Solids	mg/L	500	177.0	193.0	133.0	157.0	95.0	91.0	160.0	140.0	200.0
Total Suspended Solids	mg/L										
Total Persulfate Nitrogen (TPN)	mg/L										
Orthophosphate (OPO4)	mg/L		0.019	0.023	0.013	0.019	0.002	0.003	0.011	0.008	0.010
Biochemical Oxygen Demand (BOD)	mg/L										
Fluoride	mg/L		<0.1	<0.1	0.117	0.100	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.0025	<0.0025	<0.0025	<0.0025
Manganese	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001

1 Ecology Groundwater Criteria per WAC 173-200-040
red=secondary standards
Bold/gray values exceed standard

Table D-4. Saltese Flats Shallow Groundwater Wells and Bedrock Well Water Quality Data Summary

On-Site Groundwater Quality Data

Parameter	Unit	Standard[1]	SFW-1	SFW-1 Duplicate	SFW-1	SFW-3	SFW-3	SFW-4	SFW-4	SFW-7	SFW-7	SFW-7 Duplicate	SFW-12	SFW-12	DW-1 McGowan	DW-1 McGowan
General Location:																
Project ID:																
Alternative ID:																
Sample Date:			04/21/09	4/21/09*	07/16/09	04/21/09	07/16/09	04/21/09	07/16/09	04/21/09	07/16/09	7/16/09*	04/21/09	07/16/09	04/21/09	07/16/09
Conductivity	uS/cm		NM	NA	NM	NM	NM	NM	NM	NM	NM	NA	NM	NM	NM	NM
Water Temperature	C		NM	NA	11.9	NM	12.2	NM	13.8	NM	11.7	NA	NM	12.1	NM	NM
pH	s.u.		NM	NA	6.51	NM	6.55	NM	6.31	NM	6.45	NA	NM	6.22	NM	NM
Arsenic (As)	mg/L		0.0188	0.0107	0.0183	0.00543	0.00948	0.0132	0.0156	<0.01	0.00703	0.00622	<0.01	0.0150	<0.001	<0.001
Cadmium (Cd)	mg/L	0.01	<0.01	<0.01	<0.001	<0.001	<0.001	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01	<0.001	<0.001	<0.001
Calcium (Ca)	mg/L		62.3	36.0	73.0	24.2	26.8	38.5	41.1	32.8	42.0	39.6	25.3	29.0	17.6	19.9
Copper (Cu)	mg/L	1.0	0.0156	0.0146	0.0120	0.0207	0.0374	0.0231	0.0219	<0.01	0.00846	0.00945	0.0197	0.0410	0.0111	0.0152
Iron (Fe)	mg/L	0.30	**20.7**	**17.6**	**20.9**	**14.4**	**23.1**	**21.4**	**25.4**	**18.8**	**14.7**	**14.7**	**22.5**	**32.2**	0.279	0.130
Lead (Pb)	mg/L	0.05	0.0116	<0.01	0.00971	0.00411	0.0100	0.0152	0.0126	<0.01	0.00643	0.00667	0.0121	0.0262	0.004	0.00416
Magnesium (Mg)	mg/L		12.2	8.05	12.7	6.21	9.16	8.59	8.25	6.82	8.94	6.89	5.68	6.12	4.17	4.23
Mercury (Hg)	mg/L	0.002	<0.0001	<0.0001	<0.00005	<0.0001	<0.00005	<0.0001	<0.00005	<0.0001	<0.00005	<0.00005	<0.0001	<0.00005	<0.0001	<0.00005
Nickel (Ni)	mg/L		0.0230	0.0108	0.0176	0.0126	0.0206	0.0184	0.0183	<0.01	0.00632	0.00618	0.0143	0.0300	0.00143	0.00100
Potassium (K)	mg/L		5.42	5.30	6.48	4.03	10.8	5.88	6.74	4.94	6.54	6.10	4.56	5.18	2.47	1.36
Sodium (Na)	mg/L		140	108	139	60.1	40.1	113	97.6	71.5	88.8	80.8	75.7	68.0	13.7	15.5
Zinc (Zn)	mg/L	5.0	0.0840	0.111	0.0477	0.0901	0.159	0.192	0.101	0.240	0.201	0.0910	0.196	0.203	0.0919	0.0669
Hardness	mg/L		206	123	234	86.1	105	132	137	110	134	127	86.7	97.7	61.2	67.2
Ammonia as N	mg/L		0.580	2.24	0.592	0.489	0.726	2.17	2.66	5.32	4.63	5.38	7.39	9.13	0.050	0.020
Total Kjeldahl Nitrogen (TKN)	mg/L		6.58	10.2	5.45	2.93	4.74	15.5	16.0	7.10	8.44	9.27	13.6	37.2	0.124	<0.1
Total Phosphorous (P)	mg/L		0.576	0.888	0.402	0.247	0.913	1.41	1.01	0.307	0.409	0.386	0.604	1.71	0.0201	0.0188
Bicarbonate (HCO3)	mg/L		121	108	116	137	134	118	157	178	178	168	101	164	88	90
Carbonate (CO3)	mg/L		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloride (Cl)	mg/L	250	17.6	19.3	12.8	8.96	3.32	19.8	11.1	9.18	9.66	9.14	11.3	6.93	0.709	0.608
Nitrate (NO3)	mg/L	10	<0.1	<0.1	<2	0.323	<0.5	<0.1	<1	<0.1	<0.5	<0.5	<0.1	<0.5	<0.1	<0.1
Nitrite (NO2)	mg/L	1	<0.1	<0.1	<2	<0.1	<0.5	<0.1	<1	<0.1	<0.5	<0.5	<0.1	<0.5	<0.1	<0.1
Nitrate + Nitrite	mg/L		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sulfate (SO4)	mg/L	250	**381**	230	**375**	79.18	21.42	245	136	97.7	145	131	130	72.5	6.14	5.82
Alkalinity	mg/L		121	108	116	137	134	118	157	178	178	168	101	164	88	90
Total Dissolved Solids	mg/L	500	**656**	428	**828**	312	293	488	**588**	322	413	**504**	308	**440**	38	109
Total Suspended Solids	mg/L		278	392	104	300	1150	428	804	350	316	468	700	1380	<1	<2
Total Persulfate Nitrogen (TPN)	mg/L		-----	-----	4.93	-----	-----	-----	9.83	-----	7.06	7.65	-----	<0.1	-----	<0.1
Orthophosphate (OPO4)	mg/L		0.0344	0.0434	0.143	0.0566	0.159	0.0347	0.126	0.0486	0.124	0.121	0.0457	0.190	0.0144	0.0468
Biochemical Oxygen Demand (BOD)	mg/L		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

1 Ecology Groundwater Criteria per WAC 173-200-040
red=secondary standards
NM Not Measured
----- Not Analyzed
Bold/gray values exceed standard
* Duplicate

Table D-5. Surface Water Quality Data Summary

Surface Water Quality Data

General Location:		Above Flats							On Flats				Below Flats				
Project ID:		QC-1			UT-1		SC-1		SC-3		GP-1		SC-6			SL-1	
Site Name:		Quinnamose Creek			Unnamed Tributary		Saltese Creek		Saltese Creek		Graham Pond		Saltese Creek			Shelley Lake	
Sample Date:		04/21/09	07/16/09	7/16/09*	04/21/09	07/16/09	04/21/09	07/16/09	04/21/09	07/16/09	04/21/09	07/16/09	04/21/09	4/21/09*	07/16/09	04/21/09	07/16/09
Parameter	Unit																
Conductivity	uS/cm	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Water Temperature	C	NM	NM	NM	NM	NM	NM	NM	NM	20.2	NM	NM	NM	NM	18.5	NM	NM
pH	s.u	NM	NM	NM	NM	NM	NM	NM	NM	6.54	NM	NM	NM	NM	7.03	NM	NM
Arsenic (As)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.00113	0.00200	0.00194	0.00352	0.00137	0.00121	0.00217	<0.001	0.00119
Cadmium (Cd)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium (Ca)	mg/L	2.70	3.53	3.48	2.28	3.22	2.97	3.60	8.83	11.50	38.9	41.3	17.0	17.2	14.0	14.9	17.9
Copper (Cu)	mg/L	0.00207	<0.001	<0.001	0.00204	0.00100	0.00229	0.00176	0.00163	0.00130	<0.001	0.00105	0.00160	0.00161	0.00372	0.00151	0.00143
Iron (Fe)	mg/L	1.63	0.253	0.249	1.62	0.676	1.75	0.751	1.79	3.46	0.374	0.500	0.836	0.859	1.77	0.899	0.220
Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	mg/L	0.942	0.979	0.966	0.792	0.877	0.983	0.923	2.63	3.40	11.7	12.8	4.67	4.70	4.81	4.15	4.68
Mercury (Hg)	mg/L	<0.0001	<0.00005	<0.00005	<0.0001	<0.00005	<0.0001	<0.00005	<0.0001	<0.00005	<0.0001	<0.00005	<0.0001	<0.0001	<0.00005	<0.0001	<0.00005
Nickel (Ni)	mg/L	0.00116	<0.001	<0.001	0.00122	<0.001	0.00138	<0.001	0.00200	0.00280	0.00107	0.00136	<0.001	<0.001	<0.001	<0.001	<0.001
Potassium (K)	mg/L	0.818	0.670	0.652	0.841	0.865	1.08	1.02	1.29	1.79	3.48	2.42	1.81	1.83	2.61	1.85	2.10
Sodium (Na)	mg/L	2.64	2.87	2.78	2.77	3.44	3.07	3.10	5.46	5.32	16.30	21.30	6.83	6.92	6.01	6.67	7.68
Zinc (Zn)	mg/L	0.00436	0.0103	0.00988	0.00341	0.0126	0.00481	0.0123	0.00241	0.0115	0.00226	0.0129	0.00261	0.00274	0.0143	0.00287	0.0149
Hardness	mg/L	10.6	12.9	12.7	8.96	11.7	11.5	12.8	32.9	42.8	145	156	61.7	62.4	54.8	54.3	61.8
Ammonia as N	mg/L	<0.05	0.028	0.026	<0.05	0.026	<0.05	0.039	0.075	0.047	0.430	0.099	<0.05	0.058	0.209	<0.05	0.047
Total Kjeldahl Nitrogen (TKN)	mg/L	0.530	0.158	0.108	0.285	0.199	0.260	0.188	1.46	1.55	3.13	2.85	0.622	0.624	1.59	0.653	0.629
Total Phosphorous (P)	mg/L	0.0380	0.0224	0.0174	0.0488	0.0496	0.0646	0.540	0.0555	0.0695	0.0807	0.217	0.0803	0.0787	0.198	0.0684	0.0392
Bicarbonate (HCO3)	mg/L	<10	16	13	10	15	12	14	21	53	86	113	62	62	60	56	55
Carbonate (CO3)	mg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloride (Cl)	mg/L	1.37	0.776	0.766	1.46	1.19	1.86	0.863	5.41	1.88	8.65	8.34	6.47	6.38	3.49	6.55	5.74
Nitrate (NO3)	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.100	<0.1	0.449	0.443	<0.1	0.149	<0.1
Nitrite (NO2)	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate + Nitrite	mg/L	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sulfate (SO4)	mg/L	2.21	1.420	<0.1	1.88	1.20	2.20	0.997	9.68	<0.1	73.7	57.4	5.01	4.97	2.98	4.68	4.30
Alkalinity	mg/L	<10	16	13	10	15	12	14	21	53	86	115	62	62	60	56	63
Total Dissolved Solids	mg/L	18	50	59	32	52	26	63	56	111	170	266	48	64	75	70	117
Total Suspended Solids	mg/L	18	<2	<2	16	5	22	<2	8	6	<1	21	4	4	366	4	13
Total Persulfate Nitrogen (TPN)	mg/L	0.148	0.152	<0.1	0.158	0.167	0.260	0.184	1.13	1.12	3.56	2.78	0.747	0.875	1.09	0.952	0.477
Orthophosphate (OPO4)	mg/L	0.00971	0.0345	0.0372	0.0149	0.0502	0.0241	0.0703	0.0112	0.0320	0.0462	0.133	0.0419	0.0395	0.0643	0.0114	0.0228
Biochemical Oxygen Demand (BOD)	mg/L	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

NM Not Measured
----- Not Analyzed
* Duplicate

Table D-6. Shelley Lake Historical Water Quality Monitoring Summary

Shelley Lake Volunteer Field Chemistry - Lake Sampling
Sample Date: 7/3/2007, Lake Gage =NM
Sample Date: 8/14/2007, Lake Gage =NM

Depth (meters)	Observers	Time	pH	Conductivity (µmhos/cm)	Dissolved Oxygen		Barametric Pressure (hPa)	Depth (meters)		Temperature (°C)		Weather Conditions
					mg/l (ppm)	%		Secchi	Total	Air	Water	
July 2007												
Surface		10:00	9.17	191.1	8.83	108.2	717.0	2.0	6.4	25.0	22.5	Clear, Slight Breeze
1	B. Harris		9.12	193.8	5.42	68.0					23.4	
2	D. Ross		9.16	192.5	5.25	64.6					22.6	
3			9.10	193.9	5.11	61.1					21.0	
4			8.45	208.3	3.28	37.6					19.1	
5			7.66	214.0	1.47	16.2					17.1	
6			7.42	219.4	1.25	13.7					17.0	
August 2007												
Surface		10:00	8.80	202.1	9.20	104.0	767.8	1.8	6.2	30.0	22.8	Clear
1	B. Harris		8.80	203.3	5.40	62.2					23.9	
2	D. Ross		8.93	201.6	5.27	61.1					23.5	
3			8.85	198.9	5.15	59.3					23.0	
4			8.32	209.3	4.09	46.0					21.7	
5			7.76	230.4	2.01	22.0					20.4	
6			7.17	251.7	1.42	15.4					19.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-001	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM
Client Sample ID	042109-QC1	**Sampling Time**	9:30 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	ND	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	ND	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	1.37	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
Copper	0.00207	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	2.70	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	10.6	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	0.942	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	1.63	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.00116	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
PO4/P	0.00971	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	0.818	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	2.64	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	18	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	18	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	2.21	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
TKN	0.530	mg/L	0.1	4/30/2009	JTT	SM4500NORGC	
Total P	0.0380	mg/L	0.005	4/27/2009	JTT	SM4500PF	
TPN	0.148	mg/L	0.1	5/4/2009	JTT	SM4500N-C	
Zinc	0.00436	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; IN:C-ID-01; KY:90142; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C1320
Certifications held by Anatek Labs WA: EPA:WA00169; CA:Cert2632; ID:WA00169; WA:C1287

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-002	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM	
Client Sample ID	042109-UTI	**Sampling Time**	9:50 AM	**Extraction Date**			
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	10	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	ND	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	10	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	1.46	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
Copper	0.00204	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	2.28	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	8.96	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	0.792	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	1.62	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.00122	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
PO4/P	0.0149	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	0.841	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	2.77	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	32	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	16	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	1.88	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
TKN	0.285	mg/L	0.1	4/30/2009	JTT	SM4500NORGC	
Total P	0.0488	mg/L	0.005	4/27/2009	JTT	SM4500PF	
TPN	0.158	mg/L	0.1	5/4/2009	JTT	SM4500N-C	
Zinc	0.00341	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

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Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-003	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM	
Client Sample ID	042109-SCI	**Sampling Time**	10:05 AM	**Extraction Date**			
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	12	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	ND	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	12	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	1.86	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
Copper	0.00229	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	2.97	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	11.5	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	0.983	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	1.75	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.00138	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
PO4/P	0.0241	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	1.08	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	3.07	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	26	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	22	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	2.20	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
TKN	0.260	mg/L	0.1	4/30/2009	JTT	SM4500NORGC	
Total P	0.0646	mg/L	0.005	4/27/2009	JTT	SM4500PF	
TPN	0.260	mg/L	0.1	5/4/2009	JTT	SM4500N-C	
Zinc	0.00481	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

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Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-004	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM	
Client Sample ID	042109-SC3	**Sampling Time**	10:20 AM	**Extraction Date**			
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	21	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	0.075	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	0.00113	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	21	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	5.41	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
Copper	0.00163	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	8.83	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	32.9	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	2.63	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	1.79	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.00200	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
PO4/P	0.0112	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	1.29	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	5.46	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	56	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	8	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	9.68	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
TKN	1.46	mg/L	0.1	4/30/2009	JTT	SM4500NORGC	
Total P	0.0555	mg/L	0.005	4/27/2009	JTT	SM4500PF	
TPN	1.13	mg/L	0.1	5/4/2009	JTT	SM4500N-C	
Zinc	0.00241	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

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Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-005	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM	
Client Sample ID	042109-GP1	**Sampling Time**	12:35 PM	**Extraction Date**			
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	86	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	0.430	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	0.00194	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	86	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	8.65	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
Copper	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	38.9	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	145	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	11.7	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	0.374	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.00107	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	0.100	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
PO4/P	0.0462	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	3.48	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	16.3	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	170	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	ND	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	73.7	mg/L	0.1			EPA 300.0	
TKN	3.13	mg/L	0.1	4/30/2009	JTT	SM4500NORGC	
Total P	0.0807	mg/L	0.005	4/27/2009	JTT	SM4500PF	
TPN	3.56	mg/L	0.1	5/4/2009	JTT	SM4500N-C	
Zinc	0.00226	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

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Analytical Results Report

Sample Number	090422025-006	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM	
Client Sample ID	042109-SC6	**Sampling Time**	12:45 PM	**Extraction Date**			
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	62	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	ND	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	0.00137	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	62	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	6.47	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
Copper	0.00160	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	17.0	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	61.7	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	4.67	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	0.836	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	0.449	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
PO4/P	0.0419	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	1.81	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	6.83	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	48	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	4	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	5.01	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
TKN	0.622	mg/L	0.1	4/30/2009	JTT	SM4500NORGC	
Total P	0.0803	mg/L	0.005	4/27/2009	JTT	SM4500PF	
TPN	0.747	mg/L	0.1	5/4/2009	JTT	SM4500N-C	
Zinc	0.00261	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

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Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-007	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM
Client Sample ID	042109-SC9	**Sampling Time**	1:10 PM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	62	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	0.058	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	0.00121	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	62	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	6.38	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
Copper	0.00161	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	17.2	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	62.4	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	4.70	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	0.859	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	0.443	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
PO4/P	0.0395	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	1.83	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	6.92	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	64	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	4	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	4.97	mg/L	0.1	4/23/2009	JTT	EPA 300.0	
TKN	0.624	mg/L	0.1	4/30/2009	JTT	SM4500NORGC	
Total P	0.0787	mg/L	0.005	4/27/2009	JTT	SM4500PF	
TPN	0.875	mg/L	0.1	5/4/2009	JTT	SM4500N-C	
Zinc	0.00274	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

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Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-008	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM	
Client Sample ID	042109-SL	**Sampling Time**	4:30 PM	**Extraction Date**			
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	56	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	ND	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	56	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	6.55	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
Copper	0.00151	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	14.9	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	54.3	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	4.15	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	0.699	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	0.149	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
PO4/P	0.0114	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	1.85	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	6.67	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	70	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	4	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	4.68	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
TKN	0.653	mg/L	0.1	4/30/2009	JTT	SM4500NORGC	
Total P	0.0684	mg/L	0.005	4/29/2009	JTT	SM4500PF	
TPN	0.952	mg/L	0.1	5/4/2009	JTT	SM4500N-C	
Zinc	0.00287	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; IN:C-ID-01; KY:90142; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C1320
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Analytical Results Report

Sample Number	090422025-009	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM	
Client Sample ID	042109-SFW3	**Sampling Time**	10:30 AM	**Extraction Date**			
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	137	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	0.489	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	0.00543	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	137	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	6.96	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
Copper	0.0207	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	24.2	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	86.1	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	6.21	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	14.4	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	0.00411	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.0126	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	0.323	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
PO4/P	0.0566	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	4.03	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	60.1	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	312	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	300	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	79.180	mg/L	0.1			EPA 300.0	
TKN	2.93	mg/L	0.2	4/30/2009	JTT	SM4500NORGC	
Total P	0.247	mg/L	0.005	4/29/2009	JTT	SM4500PF	
Zinc	0.0901	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-010	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM
Client Sample ID	042109-SFW12	**Sampling Time**	10:55 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	101	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	7.39	mg/L	0.1	4/30/2009	JTT	SM4500NH3G	
Arsenic	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Bicarbonate	101	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	11.3	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
Copper	0.0197	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Calcium	25.3	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Hardness	86.7	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	5.68	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Iron	22.5	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Lead	0.0121	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.0143	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
PO4/P	0.0457	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	4.56	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Sodium	75.7	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
TDS	308	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	700	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	130	mg/L	0.1			EPA 300.0	
TKN	13.6	mg/L	0.2	4/30/2009	JTT	SM4500NORGC	
Total P	0.604	mg/L	0.005	4/29/2009	JTT	SM4500PF	
Zinc	0.196	mg/L	0.01	4/27/2009	ETL	EPA 200.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-011	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM
Client Sample ID	042109-SFW7	**Sampling Time**	11:20 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	178	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	5.32	mg/L	0.1	4/30/2009	JTT	SM4500NH3G	
Arsenic	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Bicarbonate	178	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	9.18	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
Copper	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Calcium	32.8	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Hardness	110	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	6.82	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Iron	18.8	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
PO4/P	0.0486	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	4.94	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Sodium	71.5	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
TDS	322	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	350	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	97.7	mg/L	0.1			EPA 300.0	
TKN	7.10	mg/L	0.2	4/30/2009	JTT	SM4500NORGC	
Total P	0.307	mg/L	0.005	4/29/2009	JTT	SM4500PF	
Zinc	0.240	mg/L	0.01	4/27/2009	ETL	EPA 200.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-012	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM
Client Sample ID	042109-SFW4	**Sampling Time**	12:28 PM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	118	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	2.17	mg/L	0.1	4/30/2009	JTT	SM4500NH3G	
Arsenic	0.0132	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Bicarbonate	118	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	19.8	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
Copper	0.0231	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Calcium	38.5	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Hardness	132	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	8.59	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Iron	21.4	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Lead	0.0152	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.0184	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
PO4/P	0.0347	mg/L	0.005	4/30/2009	JTT	SM4500PF	
Potassium	5.88	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Sodium	113	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
TDS	468	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	428	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	245	mg/L	0.1			EPA 300.0	
TKN	15.5	mg/L	0.2	4/30/2009	JTT	SM4500NORGC	
Total P	1.41	mg/L	0.005	4/29/2009	JTT	SM4500PF	
Zinc	0.192	mg/L	0.01	4/27/2009	ETL	EPA 200.8	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; IN:C-ID-01; KY:90142; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C1320
Certifications held by Anatek Labs WA: EPA:WA00169; CA:Cert2632; ID:WA00169; WA:C1287

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Attn: RICHARD ALLINGER

Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-013	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM
Client Sample ID	042109-SFW1	**Sampling Time**	12:45 PM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	121	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	0.580	mg/L	0.1	4/30/2009	JTT	SM4500NH3G	
Arsenic	0.0188	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Bicarbonate	121	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	17.6	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
Copper	0.0156	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Calcium	62.3	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Hardness	206	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	12.2	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Iron	20.7	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Lead	0.0116	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.0230	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
PO4/P	0.0344	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	5.42	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Sodium	140	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
TDS	656	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	278	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	381	mg/L	0.1			EPA 300.0	
TKN	6.58	mg/L	0.2	4/30/2009	JTT	SM4500NORGC	
Total P	0.576	mg/L	0.005	4/29/2009	JTT	SM4500PF	
Zinc	0.0840	mg/L	0.01	4/27/2009	ETL	EPA 200.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090422025
Project Name: SALTESE FLATS 10002604.03

Analytical Results Report

Sample Number	090422025-014	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM	
Client Sample ID	042109-SFW15	**Sampling Time**	12:45 PM	**Extraction Date**			
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	108	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	2.24	mg/L	0.1	4/30/2009	JTT	SM4500NH3G	
Arsenic	0.0107	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Bicarbonate	108	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	19.3	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
Copper	0.0146	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Calcium	36.0	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Hardness	123	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	8.05	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Iron	17.6	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Lead	ND	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.0108	mg/L	0.01	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
PO4/P	0.0434	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	5.30	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
Sodium	108	mg/L	0.5	4/24/2009	ETL	EPA 200.7	
TDS	428	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	392	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	230	mg/L	0.1			EPA 300.0	
TKN	10.2	mg/L	0.2	4/30/2009	JTT	SM4500NORGC	
Total P	0.888	mg/L	0.005	4/29/2009	JTT	SM4500PF	
Zinc	0.111	mg/L	0.01	4/27/2009	ETL	EPA 200.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090422025
Project Name: SALTESE FLATS
10002604.03

Analytical Results Report

Sample Number	090422025-015	**Sampling Date**	4/21/2009	**Date/Time Received**	4/22/2009	12:04 PM	
Client Sample ID	042109-McGOWAN	**Sampling Time**	5:48 PM	**Extraction Date**			
Matrix	Water	**Sample Location**					
Comments							

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	88	mg/L	10	4/28/2009	EMB	SM2320B	
NH3-N	0.050	mg/L	0.05	4/30/2009	JTT	SM4500NH3G	
Arsenic	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Bicarbonate	88	mg/L	10	4/28/2009	EMB	SM2320B	
Cadmium	ND	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	4/28/2009	EMB	SM2320B	
Chloride	0.709	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
Copper	0.0111	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Calcium	17.6	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Hardness	61.2	mg/L	1	4/24/2009	ETL	EPA 200.7	
Magnesium	4.17	mg/L	0.1	4/24/2009	ETL	EPA 200.7	
Iron	0.279	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Lead	0.00400	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
Mercury-CV	ND	mg/L	0.0001	5/5/2009	ETL	EPA 245.2	
Nickel	0.00143	mg/L	0.001	4/27/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
NO2/N	ND	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
PO4/P	0.0144	mg/L	0.01	4/30/2009	JTT	SM4500PF	
Potassium	2.47	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
Sodium	13.7	mg/L	0.05	4/24/2009	ETL	EPA 200.7	
TDS	38	mg/L	10	4/27/2009	EMB	EPA 160.1	
TSS	ND	mg/L	1	4/23/2009	EMB	EPA 160.2	
Sulfate	6.14	mg/L	0.1	4/24/2009	JTT	EPA 300.0	
TKN	0.124	mg/L	0.1	4/30/2009	JTT	SM4500NORGC	
Total P	0.0201	mg/L	0.005	4/29/2009	JTT	SM4500PF	
Zinc	0.0919	mg/L	0.001	4/27/2009	ETL	EPA 200.8	

Authorized Signature Kathleen A. Sattler

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; IN:C-ID-01; KY:90142; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C1320
Certifications held by Anatek Labs WA: EPA:WA00169; CA:Cert2632; ID:WA00169; WA:C1287

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Login Report

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
10002604.03

Comment:

Sample #: 090422025-001 **Customer Sample #:** 042109-QC1

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

TPN	SM4500N-C	5/4/2009	***Normal (6-10 Days)***
ZINC	EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Sample #: 090422025-002 **Customer Sample #:** 042109-UTI

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-003 **Customer Sample #:** 042109-SCI

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-004 **Customer Sample #:** 042109-SC3

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-005 **Customer Sample #:** 042109-GP1

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-006 **Customer Sample #:** 042109-SC6

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-007 **Customer Sample #:** 042109-SC9

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-008 **Customer Sample #:** 042109-SL

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-009 **Customer Sample #:** 042109-SFW3

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-010 **Customer Sample #:** 042109-SFW12

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-011 **Customer Sample #:** 042109-SFW7

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-012 **Customer Sample #:** 042109-SFW4

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-013 **Customer Sample #:** 042109-SFW1

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-014 **Customer Sample #:** 042109-SFW15

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090422025
Order Date: 4/22/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 10002604.03

Comment:

Sample #: 090422025-015 **Customer Sample #:** 042109-McGOWAN

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 4/21/2009
Quantity: 1 **Matrix:** Water **Date Received:** 4/22/2009 12:04:00 P
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	4/24/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	5/4/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	4/24/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
MERCURY-CV		EPA 245.2	5/4/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	5/4/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	5/4/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	4/29/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	4/29/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	5/4/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	5/4/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	5/4/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	5/4/2009	***Normal (6-10 Days)***

Customer Name:	PBS & J			**Order ID:**	090422025
	PO BOX 990			**Order Date:**	4/22/2009
	VERADALE	WA	99037-0990		
Contact Name:	RICHARD ALLINGER			**Project Name:**	SALTESE FLATS 10002604.03
Comment:					

SAMPLE CONDITION RECORD

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature inside the cooler?	2.8
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Are VOC samples free of headspace?	N/A
Is there a trip blank to accompany VOC samples?	N/A
Labels and chain agree?	Yes

Anatek Labs, Inc.

Chain of Custody Record

1282 Alturas Drive, Moscow ID 83843 (208) 883-2839 FAX 882-9246
504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433

090422 025 **PBSJ** Last Due **5/4/2009**
1st SAMP 4/21/2009 1st RCVD 4/22/2009
SALTESE FLATS 10002604.03

Company Name: PBS J J	Project Manager: RICH ALLINGER
Address: 15320 E Marietta #9	Project Name & #: SALTESE FLATS 10002604.03
City: Spokane Valley State: WA Zip: 99206	Email Address: RJALLINGER@PBSJ.COM
Phone: 509 926 7275	Purchase Order #:
Fax:	Sampler Name & phone: RICH ALLINGER 509-926-7275

Turn Around Time

Please refer to our normal turn around times at:
http://www.anateklabs.com/services/guidelines/reporting.asp

X Normal
__Next Day*
__2nd Day*
__Other*

*All rush order requests must be prior approved.

__Phone
__Mail
__Fax
__Email

page 1 of 2

Provide Sample Description | **List Analyses Requested** | **Note Special Instructions/Comments**

Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Sample Volume	Preservative	As, Cd, Ca, Cu, Fe, Pb, Mg	Hg, Ni, K, Na, Zn, Hardness	Ammonia as N, TKN, TP, P	Bicarb, Carb, Chloride	Nitrate Nitrite, SO4, Alkal.	TDS, TSS, Orthophosph.	TPN			
									X							
1	042109-QC1	4/21/09 9:30	WATER	3			X	X	X	X	X	X	X			
2	042109-UT1	4/21/09 9:50	WATER	3			X	X	X	X	X	X	X			
3	042109-SC1	4/21/09 10:05	WATER	3			X	X	X	X	X	X	X			
4	042109-SC3	4/21/09 10:20	WATER	3			X	X	X	X	X	X	X			
5	042109-GP1	4/21/09 12:35	WATER	3			X	X	X	X	X	X	X			
6	042109-SC6	4/21/09 12:45	WATER	3			X	X	X	X	X	X	X			
7	042109-SC9	4/21/09 13:10	WATER	3			X	X	X	X	X	X	X			
8	042109-SL	4/21/09 16:30	WATER	3			X	X	X	X	X	X	X			
9	042109-SFW3	4/21/09 10:30	WATER	3			X	X	X	X	X	X				
10	042109-SFW12	4/21/09 10:55	WATER	3			X	X	X	X	X	X				
11	042109-SFW7	4/21/09 11:20	WATER	3			X	X	X	X	X	X				
12	042109-SFW9	4/21/09 12:28	WATER	3			X	X	X	X	X	X				
13	042109-SFW1	4/21/09 12:45	WATER	3			X	X	X	X	X	X				

SWBS

TP, TKN, NH3
metals, hard, TPN, OP, NO2/NO3 - m1
alk, bicarb, TDS, TSS, Cl, SO4, carb-s

	Printed Name	Signature	Company	Date	Time
Relinquished by	Richard Allinger		PBSJ	4/22/09	1204
Received by	Kent	Kent	Anatek	4/22	1204
Relinquished by					
Received by					
Relinquished by					
Received by					

Inspection Checklist

Received Intact?	(Y)	N
Labels & Chains Agree?	(Y)	N
Containers Sealed?	Y	N
VOC Head Space?	Y	N

Cooler/hand del

Temperature (°C): 2.8°
Preservative: H2SO4 / ice
Date & Time: 4-22-09
Inspected By: KB

Anatek Labs, Inc.

Chain of Custody Record

1282 Alturas Drive, Moscow ID 83843 (208) 883-2839 FAX 882-9246
504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433

090422 025 **PBSJ** Last Due 5/4/2009
1st SAMP 4/21/2009 1st RCVD 4/22/2009
SALTESE FLATS 10002604.03

Company Name: PBS&J
Address: 15320 E MARIETTA #9
City: SPOKANE VALLEY State: WA Zip: 99206
Phone: 509-926-7275
Fax:

Project Manager: RICH ALLINGER
Project Name & #: SALTESE FLATS 10002604.03
Email Address: RJALLINGER@PBSJ.COM
Purchase Order #:
Sampler Name & phone: RICH ALLINGER 509-926-7275

Please refer to our normal turn around times at http://www.anateklabs.com/services/guidelines/reporting.asp

__Normal __Next Day* __2nd Day* __Other*____
*All rush order requests must be prior approved.
__Phone __Mail __Fax __Email

Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Sample Volume	Preservative	As, Cd, Ca, Cu, Fe, Pb, Mg	Hg, Ni, K, Na, Zn, Hardness	Ammonia as N, TKN, TP	Bicarb, Carb, Chloride	Nitrate/Nitrite, SO4, Alkal	TDS, TSS, Orthophosph	TPN			
14	042109-SFW15	4/21/09 12:45	WATER	3			X	X	X	X	X	X				
15	042101-McGowan	4/21/09 17:48	WATER	3			X	X	X	X	X	X				

Note Special Instructions/Comments

page 2 of 2

	Printed Name	Signature	Company	Date	Time
Relinquished by	Richard Allinger		PBSJ	4/22/09	1204
Received by			Anatek	4/22	1204
Relinquished by					
Received by					
Relinquished by					
Received by					

Inspection Checklist

Received Intact? Y N
Labels & Chains Agree? Y N
Containers Sealed? Y N
VOC Head Space? Y N

hand del/cooler

Temperature (°C): 2.8°
Preservative: H2SO4/ice
Date & Time: 4-22-09
Inspected By: KS

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090717004
Project Name: SALTESE FLATS
100002604 03.02

Analytical Results Report

Sample Number	090717004-001	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SC1	**Sampling Time**	11:15 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	14	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.039	mg/L	0.05	7/22/2009	KME	SM4500NH3G	
Arsenic	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	14	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	0.863	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
Copper	0.00176	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	3.60	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	12.8	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	0.923	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	0.751	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/29/2009	ETL	EPA 245.7	
Nickel	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
PO4/P	0.0703	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	1.02	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	3.10	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	63	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	ND	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	0.997	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
TKN	0.168	mg/L	0.1	7/24/2009	KME	SM4500NORGC	
Total P	0.540	mg/L	0.005	7/23/2009	JTT	SM4500PF	
TPN	0.184	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.0123	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

Anatek Labs, Inc.

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504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090717004
Project Name: SALTESE FLATS
100002604 03.02

Analytical Results Report

Sample Number	090717004-002	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SC3	**Sampling Time**	8:40 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	53	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.047	mg/L	0.05	7/22/2009	KME	SM4500NH3G	
Arsenic	0.00200	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	53	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	1.88	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
Copper	0.00130	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	11.5	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	42.8	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	3.40	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	3.46	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/29/2009	ETL	EPA 245.7	
Nickel	0.00280	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
PO4/P	0.0320	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	1.79	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	5.32	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	111	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	6	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
TKN	1.55	mg/L	0.1	7/24/2009	KME	SM4500NORGC	
Total P	0.0695	mg/L	0.01	7/23/2009	JTT	SM4500PF	
TPN	1.12	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.0115	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090717004
Project Name: SALTESE FLATS
100002604 03.02

Analytical Results Report

Sample Number	090717004-003	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SC6	**Sampling Time**	9:20 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	60	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.209	mg/L	0.05	7/22/2009	KME	SM4500NH3G	
Arsenic	0.00217	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	60	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	3.49	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
Copper	0.00372	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	14.0	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	54.8	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	4.81	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	1.77	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Magnesium	4.81	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Mercury-CVAFS	ND	ug/L	0.05	7/29/2009	ETL	EPA 245.7	
Nickel	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
PO4/P	0.0643	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	2.61	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	6.01	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	75	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	366	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	2.98	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
TKN	1.59	mg/L	0.1	7/24/2009	KME	SM4500NORGC	
Total P	0.198	mg/L	0.01	7/23/2009	JTT	SM4500PF	
TPN	1.09	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.0143	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Analytical Results Report

Sample Number	090717004-004	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SC9	**Sampling Time**	12:00 PM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	13	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.026	mg/L	0.05	7/22/2009	KME	SM4500NH3G	
Arsenic	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	13	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	0.766	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
Copper	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	3.48	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	12.7	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	0.966	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	0.249	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/29/2009	ETL	EPA 245.7	
Nickel	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
PO4/P	0.0372	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	0.652	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	2.78	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	59	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	ND	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
TKN	0.108	mg/L	0.1	7/24/2009	KME	SM4500NORGC	
Total P	0.0174	mg/L	0.005	7/23/2009	JTT	SM4500PF	
TPN	ND	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.00988	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Analytical Results Report

Sample Number	090717004-005	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-GP1	**Sampling Time**	11:30 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	115	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.099	mg/L	0.05	7/22/2009	KME	SM4500NH3G	
Arsenic	0.00362	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	113	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	8.34	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
Copper	0.00105	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	41.3	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	156	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	12.8	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	0.500	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/29/2009	ETL	EPA 245.7	
Nickel	0.00136	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
PO4/P	0.133	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	2.42	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	21.3	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	266	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	21	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	57.4	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
TKN	2.85	mg/L	0.1	7/24/2009	KME	SM4500NORGC	
Total P	0.217	mg/L	0.01	7/23/2009	JTT	SM4500PF	
TPN	2.78	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.0129	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Analytical Results Report

Sample Number	090717004-006	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-QC1	**Sampling Time**	10:15 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	16	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.028	mg/L	0.05	7/22/2009	KME	SM4500NH3G	
Arsenic	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	16	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	0.776	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
Copper	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	3.53	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	12.9	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	0.979	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	0.253	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/29/2009	ETL	EPA 245.7	
Nickel	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
PO4/P	0.0345	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	0.670	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	2.87	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	50	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	ND	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	1.420	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
TKN	0.158	mg/L	0.1	7/24/2009	KME	SM4500NORGC	
Total P	0.0224	mg/L	0.005	7/23/2009	JTT	SM4500PF	
TPN	0.152	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.0103	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Analytical Results Report

Sample Number	090717004-007	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-UT1	**Sampling Time**	10:30 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	15	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.026	mg/L	0.05	7/22/2009	KME	SM4500NH3G	
Arsenic	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	15	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	1.19	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
Copper	0.00100	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	3.22	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	11.7	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	0.877	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	0.676	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/29/2009	ETL	EPA 245.7	
Nickel	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
PO4/P	0.0502	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	0.865	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	3.44	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	52	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	5	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	1.20	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
TKN	0.199	mg/L	0.1	7/24/2009	KME	SM4500NORGC	
Total P	0.0496	mg/L	0.005	7/23/2009	JTT	SM4500PF	
TPN	0.187	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.0126	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Analytical Results Report

Sample Number	090717004-008	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SL	**Sampling Time**	11:50 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	63	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.047	mg/L	0.05	7/22/2009	KME	SM4500NH3G	
Arsenic	0.00119	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	55	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	5.74	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
Copper	0.00143	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	17.0	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	61.8	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	4.68	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	0.220	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/30/2009	ETL	EPA 245.7	
Nickel	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
PO4/P	0.0228	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	2.10	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	7.68	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	117	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	13	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	4.30	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
TKN	0.629	mg/L	0.1	7/24/2009	KME	SM4500NORGC	
Total P	0.0392	mg/L	0.005	7/23/2009	JTT	SM4500PF	
TPN	0.477	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.0149	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Analytical Results Report

Sample Number	090717004-009	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-DW1	**Sampling Time**	10:45 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	90	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.020	mg/L	0.05	7/22/2009	KME	SM4500NH3G	
Arsenic	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	90	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	0.608	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
Copper	0.0152	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	19.9	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	67.2	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	4.23	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	0.130	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	0.00416	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/30/2009	ETL	EPA 245.7	
Nickel	0.00100	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
PO4/P	0.0468	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	1.36	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	15.5	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	109	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	ND	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	5.82	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
TKN	ND	mg/L	0.1	7/27/2009	KME	SM4500NORGC	
Total P	0.0188	mg/L	0.005	7/23/2009	JTT	SM4500PF	
TPN	ND	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.0669	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090717004
Project Name: SALTESE FLATS
100002604 03.02

Analytical Results Report

Sample Number	090717004-010	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SFW3	**Sampling Time**	8:40 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	134	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.726	mg/L	0.5	7/22/2009	KME	SM4500NH3G	
Arsenic	0.00948	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	134	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	3.32	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
Copper	0.0374	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	26.8	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	105	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	9.16	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	23.1	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	0.0100	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/30/2009	ETL	EPA 245.7	
Nickel	0.0206	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
PO4/P	0.159	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	10.8	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	40.1	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	293	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	1150	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	21.42	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
TKN	4.74	mg/L	0.5	7/27/2009	KME	SM4500NORGC	
Total P	0.913	mg/L	0.01	7/23/2009	JTT	SM4500PF	
TPN	4.25	mg/L	0.2	7/24/2009	KME	SM4500N-C	
Zinc	0.159	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090717004
Project Name: SALTESE FLATS
100002604 03.02

Analytical Results Report

Sample Number	090717004-011	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SFW20	**Sampling Time**	10:30 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	168	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	5.38	mg/L	0.25	7/27/2009	KME	SM4500NH3G	
Arsenic	0.00622	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	168	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	9.14	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
Copper	0.00945	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	39.6	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	127	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	6.69	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	14.7	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	0.00667	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/30/2009	ETL	EPA 245.7	
Nickel	0.00618	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
PO4/P	0.121	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	6.10	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	80.8	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	504	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	468	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	131	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
TKN	9.27	mg/L	0.5	7/27/2009	KME	SM4500NORGC	
Total P	0.386	mg/L	0.01	7/23/2009	JTT	SM4500PF	
TPN	7.65	mg/L	0.2	7/24/2009	KME	SM4500N-C	
Zinc	0.0910	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Attn: RICHARD ALLINGER

Batch #: 090717004
Project Name: SALTESE FLATS
100002604 03.02

Analytical Results Report

Sample Number	090717004-012	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SFW7	**Sampling Time**	10:02 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	178	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	4.63	mg/L	0.25	7/27/2009	KME	SM4500NH3G	
Arsenic	0.00703	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	178	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	9.66	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
Copper	0.00846	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	42.0	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	134	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	6.94	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	14.7	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	0.00643	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/30/2009	ETL	EPA 245.7	
Nickel	0.00632	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
PO4/P	0.124	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	6.54	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	88.8	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	413	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	316	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	145	mg/L	0.1	7/21/2009	EMB	EPA 300.0	
TKN	8.44	mg/L	0.5	7/27/2009	KME	SM4500NORGC	
Total P	0.409	mg/L	0.01	7/23/2009	JTT	SM4500PF	
TPN	7.06	mg/L	0.2	7/24/2009	KME	SM4500N-C	
Zinc	0.201	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Project Name: SALTESE FLATS
100002604 03.02

Analytical Results Report

Sample Number	090717004-013	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SFW1	**Sampling Time**	9:35 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	116	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	0.592	mg/L	0.25	7/27/2009	KME	SM4500NH3G	
Arsenic	0.0183	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	116	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	12.8	mg/L	2	7/17/2009	EMB	EPA 300.0	
Copper	0.0120	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	73.0	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	234	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	12.7	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	20.9	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	0.00971	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/30/2009	ETL	EPA 245.7	
Nickel	0.0176	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	2	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	2	7/17/2009	EMB	EPA 300.0	
PO4/P	0.143	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	6.48	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	139	mg/L	0.1	7/28/2009	ETL	EPA 200.7	
TDS	828	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	104	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	375	mg/L	2	7/17/2009	EMB	EPA 300.0	
TKN	5.45	mg/L	0.4	7/27/2009	KME	SM4500NORGC	
Total P	0.402	mg/L	0.01	7/23/2009	JTT	SM4500PF	
TPN	4.93	mg/L	0.2	7/24/2009	KME	SM4500N-C	
Zinc	0.0477	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090717004
Project Name: SALTESE FLATS
100002604 03.02

Analytical Results Report

Sample Number	090717004-014	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SFW12	**Sampling Time**	10:50 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	164	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	9.13	mg/L	0.25	7/27/2009	KME	SM4500NH3G	
Arsenic	0.0150	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	164	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	6.93	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
Copper	0.0410	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	29.0	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	97.7	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	6.12	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	32.2	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	0.0262	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	0.126	ug/L	0.05	7/30/2009	ETL	EPA 245.7	
Nickel	0.0300	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
PO4/P	0.190	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	5.18	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	68.0	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
TDS	440	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	1380	mg/L	2	7/20/2009	JLU	EPA 160.2	
Sulfate	72.5	mg/L	0.5	7/17/2009	EMB	EPA 300.0	
TKN	37.2	mg/L	0.5	7/27/2009	KME	SM4500NORGC	
Total P	1.71	mg/L	0.01	7/23/2009	JTT	SM4500PF	
TPN	ND	mg/L	0.1	7/24/2009	KME	SM4500N-C	
Zinc	0.203	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

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Client: PBS & J
Address: PO BOX 990
VERADALE, WA 99037-0990
Attn: RICHARD ALLINGER

Batch #: 090717004
Project Name: SALTESE FLATS
100002604 03.02

Analytical Results Report

Sample Number	090717004-015	**Sampling Date**	7/16/2009	**Date/Time Received**	7/17/2009	10:08 AM
Client Sample ID	071609-SFW4	**Sampling Time**	11:20 AM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Alkalinity	157	mg/L	10	7/20/2009	KEA	SM2320B	
NH3-N	2.66	mg/L	0.25	7/27/2009	KME	SM4500NH3G	
Arsenic	0.0156	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Bicarbonate	157	mg/L	10	7/20/2009	KEA	SM2320B	
Cadmium	ND	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Carbonate	ND	mg/L	10	7/20/2009	KEA	SM2320B	
Chloride	11.1	mg/L	1	7/17/2009	EMB	EPA 300.0	
Copper	0.0219	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Calcium	41.1	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Hardness	137	mg/L	1	7/22/2009	ETL	EPA 200.7	
Magnesium	8.25	mg/L	0.1	7/22/2009	ETL	EPA 200.7	
Iron	25.4	mg/L	0.01	7/22/2009	ETL	EPA 200.7	M3
Lead	0.0126	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
Mercury-CVAFS	ND	ug/L	0.05	7/30/2009	ETL	EPA 245.7	
Nickel	0.0183	mg/L	0.001	7/22/2009	ETL	EPA 200.8	
NO3/N	ND	mg/L	1	7/17/2009	EMB	EPA 300.0	
NO2/N	ND	mg/L	1	7/17/2009	EMB	EPA 300.0	
PO4/P	0.126	mg/L	0.005	7/17/2009	KAS	SM4500PF	
Potassium	6.74	mg/L	0.01	7/22/2009	ETL	EPA 200.7	
Sodium	97.6	mg/L	0.1	7/28/2009	ETL	EPA 200.7	
TDS	588	mg/L	10	7/24/2009	KEA	EPA 160.1	
TSS	804	mg/L	1	7/20/2009	JLU	EPA 160.2	
Sulfate	136	mg/L	0.1	7/17/2009	EMB	EPA 300.0	
TKN	16.0	mg/L	0.5	7/27/2009	KME	SM4500NORGC	
Total P	1.01	mg/L	0.01	7/23/2009	JTT	SM4500PF	
TPN	9.83	mg/L	1	7/24/2009	KME	SM4500N-C	
Zinc	0.101	mg/L	0.001	7/22/2009	ETL	EPA 200.8	

Authorized Signature Kathleen A. Sattler

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; IN:C-ID-01; KY:90142; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C1320
Certifications held by Anatek Labs WA: EPA:WA00169; CA:Cert2632; ID:WA00169; WA:C1287

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Login Report

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-001 **Customer Sample #:** 071609-SC1

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 100002604 03.02

Comment:

TKN	SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA	SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN	SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC	EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Sample #: 090717004-002 **Customer Sample #:** 071609-SC3

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS 100002604 03.02

Comment:

ZINC	EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Sample #: 090717004-003 **Customer Sample #:** 071609-SC6

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-004 **Customer Sample #:** 071609-SC9

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-005 **Customer Sample #:** 071609-GP1

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-006 **Customer Sample #:** 071609-QC1

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-007 **Customer Sample #:** 071609-UT1

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-008 **Customer Sample #:** 071609-SL

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-009 **Customer Sample #:** 071609-DW1

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-010 **Customer Sample #:** 071609-SFW3

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-011 **Customer Sample #:** 071609-SFW20

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-012 **Customer Sample #:** 071609-SFW7

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-013 **Customer Sample #:** 071609-SFW1

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-014 **Customer Sample #:** 071609-SFW12

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name: PBS & J
PO BOX 990
VERADALE WA 99037-0990

Order ID: 090717004
Order Date: 7/17/2009

Contact Name: RICHARD ALLINGER

Project Name: SALTESE FLATS
100002604 03.02

Comment:

Sample #: 090717004-015 **Customer Sample #:** 071609-SFW4

Recv'd: ☑ **Collector:** RICH ALLINGER **Date Collected:** 7/16/2009
Quantity: 1 **Matrix:** Water **Date Received:** 7/17/2009 10:08:00 A
Comment:

Test	Test Group	Method	Due Date	Priority
ALKALINITY		SM2320B	7/19/2009	***Normal (6-10 Days)***
AMMONIA-NITROGEN		SM4500NH3G	7/27/2009	***Normal (6-10 Days)***
ARSENIC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
BICARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CADMIUM		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
CALCIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
CARBONATE		SM2320B	7/19/2009	***Normal (6-10 Days)***
CHLORIDE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
COPPER		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
HARDNESS by EPA 200.7		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
IRON ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
LEAD		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
MAGNESIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
MERCURY-CVAFS		EPA 245.7	7/27/2009	***Normal (6-10 Days)***
NICKEL		EPA 200.8	7/27/2009	***Normal (6-10 Days)***
NITRATE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
NITRITE/N		EPA 300.0	7/19/2009	***Normal (6-10 Days)***
PHOSPHATE/P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
POTASSIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SODIUM ICP		EPA 200.7	7/27/2009	***Normal (6-10 Days)***
SOLIDS - TDS		EPA 160.1	7/24/2009	***Normal (6-10 Days)***
SOLIDS - TSS		EPA 160.2	7/24/2009	***Normal (6-10 Days)***
SULFATE		EPA 300.0	7/27/2009	***Normal (6-10 Days)***
TKN		SM4500NORGC	7/27/2009	***Normal (6-10 Days)***
TOTAL P FIA		SM4500PF	7/27/2009	***Normal (6-10 Days)***
TPN		SM4500N-C	7/17/2009	***Normal (6-10 Days)***
ZINC		EPA 200.8	7/27/2009	***Normal (6-10 Days)***

Customer Name:	PBS & J			**Order ID:**	090717004
	PO BOX 990			**Order Date:**	7/17/2009
	VERADALE	WA	99037-0990		
Contact Name:	RICHARD ALLINGER			**Project Name:**	SALTESE FLATS 100002604 03.02
Comment:					

SAMPLE CONDITION RECORD

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature inside the cooler?	9.0
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Are VOC samples free of headspace?	N/A
Is there a trip blank to accompany VOC samples?	N/A
Labels and chain agree?	Yes

Anatek Labs, Inc.

Chain of Custody Record

1282 Alturas Drive, Moscow ID 83843 (208) 883-2839 FAX 882-9246
504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433

Ana Log 090717 004 PBSJ Last Due 7/27/2009
1st SAMP 7/16/2009 1st RCVD 7/17/2009
SALTESE FLATS 100002604 03.02

Company Name: PBS&J
Address: 15320 E. MARIETTA #9
City: SPOKANE VALLEY State: WA Zip: 99206
Phone: 509 926-7275
Fax:

Project Manager: RICH ALLINGER
Project Name & #: SALTESE FLATS 100002604 03.02
Email Address: RJALLINGER@PBSJ.COM
Purchase Order #:
Sampler Name & phone: RICH ALLINGER 509 926-7275

Please refer to our normal turn around times at: http://www.anateklabs.com/services/guidelines/reporting.asp

X Normal __Next Day* __2nd Day* __Other*_____
*All rush order requests must be prior approved.
__Phone __Mail __Fax __Email

PAGE 1 of 2

Provide Sample Description

List Analyses Requested

Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Sample Volume	Preservative	As, Cd, Ca, Cu, Fe, Pb, Mg	Na, K, Na, Zn, Hardness	Ammonia as N, TKN, TTLP	Bicarb, Carb, Chloride	Nitrate, Nitrite, SO4, Alkal.	TDS, TSS, Orthophosph	pH	TPN			
1	071609-SC1	7/16/09 11:15	WATER	5			X	X	X	X	X	X	X	X			
2	071609-SC3	7/16/09 8:40	WATER	5			X	X	X	X	X	X	X	X			
3	071609-SC6	7/16/09 9:20	WATER	5			X	X	X	X	X	X	X	X			
4	071609-SC9	7/16/09 12:00	WATER	5			X	X	X	X	X	X	X	X			
5	071609-GP1	7/16/09 11:30	WATER	5			X	X	X	X	X	X	X	X			
6	071609-QC1	7/16/09 10:15	WATER	5			X	X	X	X	X	X	X	X			
7	071609-UT1	7/16/09 10:30	WATER	5			X	X	X	X	X	X	X	X			
8	071609-SL	7/16/09 11:50	WATER2	5			X	X	X	X	X	X	X	X			

Note Special Instructions/Comments

SWBS

M - metals, NH3, TP, TKN, hard
S - rest

	Printed Name	Signature	Company	Date	Time
Relinquished by	Rich Allinger		PBS&J	7-17-09	1005
Received by	MLewis	MLewis	Anatek	7-17-09	10:08
Relinquished by					
Received by					
Relinquished by					
Received by					

Inspection Checklist

Received Intact? (Y) N
Labels & Chains Agree? (Y) N
Containers Sealed? (Y) N
VOC Head Space? Y N

hand del / 2 coolers

Temperature (°C): 9.0
Preservative: HNO_3, H_2SO_4
Date & Time: 7-17-09 10:08
Inspected By: MLewis

Anatek Labs, Inc.

Chain of Custody Record

1282 Alturas Drive, Moscow ID 83843 (208) 883-2839 FAX 882-9246
504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433

U90717 004 **PBSJ** Last Due 7/27/2009
1st SAMP 7/16/2009 1st RCVD 7/17/2009
SALTESE FLATS 100002604 03.02

Company Name: PBS&J
Address: 15320 E. MARIETTA #9
City: SPOKANE VALLEY State: WA Zip 99206
Phone: 509 926-7275
Fax:

Project Manager: RICH ALLINGER
Project Name & #: SALTESE FLATS 100002604 03.02
Email Address: RJALLINGER@PBSJ.COM
Purchase Order #:
Sampler Name & phone: RICH ALLINGER 509 926-7275

Please refer to our normal turn around times
http://www.anateklabs.com/services/guidelines/reporting.asp

X Normal
__ Next Day*
__ 2nd Day*
__ Other*_____
*All rush order requests must be prior approved.

__ Phone
__ Mail
__ Fax
__ Email

PAGE 2 of 2

Provide Sample Description

List Analyses Requested

Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of Containers	Preservative	Sample Volume	As, Cd, Ca, Cu, Fe, Pb, Mg	Ni, K, Na, Zn, Hardness	Ammonia as N, TKN, TTL P	Bicarb, Carb, Chloride	Nitrate, Nitrite, SO4, Alkal.	TDS, TSS, Ortho Phosph	Hg X	TPN			
9	071609-DW1	7/16/09 10:45	WATER	5			X	X	X	X	X	X	X				
10	071609-SFW3	7/16/09 8:40	WATER	5			X	X	X	X	X	X	X				
11	071609-SFW20	7/16/09 10:30	WATER	5			X	X	X	X	X	X	X				
12	071609-SFW7	7/16/09 10:02	WATER	5			X	X	X	X	X	X	X				
13	071609-SFW1	7/16/09 9:35	WATER	5			X	X	X	X	X	X	X				
14	071609-SFW12	7/16/09 10:50	WATER	5			X	X	X	X	X	X	X				
15	071609-SFW4	7/16/09 11:20	WATER	5			X	X	X	X	X	X	X				

Note Special Instructions/Comments

	Printed Name	Signature	Company	Date	Time
Relinquished by	Rich Allinger		PBS&J	7/17/09	1005
Received by			Anatek	7-17-09	10:08
Relinquished by					
Received by					
Relinquished by					
Received by					

Inspection Checklist

Received Intact? (Y) N
Labels & Chains Agree? (Y) N
Containers Sealed? (Y) N
VOC Head Space? Y N
hand del / 2 coolers
Temperature (°C): 9.0°
Preservative: HNO_3, H_2SO_4
Date & Time: 7-17-09 10:08
Inspected By: MClemens

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

TO: PBS & J
ADDRESS: Attn: Greg Howard
1120 Cedar St.
Missoula, Montana 59802

LAB NO.: B09030591-001-010
DATE: 4/6/09

Saltese Flats Wetland Feasability Study

FERTILIZER RECOMMENDATIONS

Fertilizer Suggested in Actual Pounds per Acre

FIELD	S1-1	S1-2	S2-1	S2-2	S4-1	S4-2
CROP	Plants	Plants	Plants	Plants	Plants	Plants
PROJECTED YIELD	2T	2T	2T	2T	2T	2T
Nitrogen						
Total	20	35	0	30	0	20
Preplant/Spring						
After 1st Cutting						
Phosphrus (P_2O_5)						
Broadcast	30	0	0	0	50	50
Banded						
Potassium (K_2O)						
Broadcast	100	100	120	120	100	100
Banded						
Sulphur (S)						
Zinc (Zn)						
Iron (Fe)						
Lime	0T	10T	0T	0T	3T	5T
Gypsum	0T	0T	0T	4T	0T	0T

COMMENTS: All soils are quite low in potassium. S6-1 and S6-2 are very low in phosphorus. Sites that have lime recommended have a low pH which can cause aluminum toxicity. S2-2 has a pH of 7.4 and is deficient in calcium. Gyspum has to be applied here to increase soil calcium. Lime does not work when pH is above 6.5.

PREPARED BY: Neal Fehringer, Certified Professional Agronomist, C.C.A., (406) 860-3647.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

Saltese Flats Wetland Feasability Study

FERTILIZER RECOMMENDATIONS

Fertilizer Suggested in Actual Pounds per Acre

FIELD	S5-1	S5-2	S6-1	S6-2
CROP	Plants	Plants	Plants	Plants
PROJECTED YIELD	2T	2T	2T	2T
Nitrogen				
Total	0	0	0	30
Preplant/Spring				
After 1st Cutting				
Phosphrus (P_2O_5)				
Broadcast	50	50	75	75
Banded				
Potassium (K_2O)				
Broadcast	100	100	120	100
Banded				
Sulphur (S)				
Zinc (Zn)				
Iron (Fe)				
Copper (Cu)				
Lime	7T	7T	5T	6T
Gypsum	0T	0T	0T	0T

COMMENTS: _____

_____

_____

PREPARED BY: Neal Fehringer, Certified Professional Agronomist, C.C.A., (406) 860-3647.

ENERGY LABORATORIES, INC. * 1120 S 27th St * PO Box 30916 * Billings, MT 59107-0916
Toll Free 800.735.4489 * 406.252.6325 * FAX 406.252.6069 * eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study
Report Date: 04/09/09

Lab ID: B09030591-001
Client Sample ID: Saltese S1-1 (0-1)
Matrix: Soil
Collection Date: 11/20/08
DateReceived: 03/09/09

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	SiL					ASA15-5	03/18/09 16:38 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	None					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	03/18/09 09:56 / srm
Nitrate as N, KCL Extract	10	mg/kg		1		ASA33-8	03/18/09 13:01 / srm
Organic Matter	8.43	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	74	mg/kg		10		SW6010B	03/17/09 02:27 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.13	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	6.1	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	0.7	meq/100g		0.2		SW6010B	03/17/09 04:08 / tao
Sodium Equivalents	0.3	meq/100g		0.2		SW6010B	03/17/09 04:08 / tao
Sulfate as S	128	mg/kg		0.3		ASA10-3	03/17/09 00:35 / kh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study **Report Date:** 04/09/09

Lab ID: B09030591-002 **Collection Date:** 11/20/08
Client Sample ID: Saltese S1-2 (4-5) **DateReceived:** 03/09/09
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	SiL					ASA15-5	03/18/09 16:38 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	None					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	15	mg/kg		1		ASA24-5	03/18/09 10:00 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/18/09 13:28 / srm
Organic Matter	0.84	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	89	mg/kg		10		SW6010B	03/17/09 02:35 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.43	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	3.7	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	2.0	meq/100g		0.2		SW6010B	03/17/09 04:12 / tao
Sodium Equivalents	0.2	meq/100g		0.2		SW6010B	03/17/09 04:12 / tao
Sulfate as S	653	mg/kg		0.3		ASA10-3	03/17/09 00:47 / kh

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study **Report Date:** 04/09/09

Lab ID: B09030591-003 **Collection Date:** 11/20/08
Client Sample ID: Saltese S2-1 (0-1) **DateReceived:** 03/09/09
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	SiCL					ASA15-5	03/18/09 16:38 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	None					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	10	mg/kg		1		ASA24-5	03/18/09 10:01 / srm
Nitrate as N, KCL Extract	35	mg/kg		1		ASA33-8	03/18/09 13:05 / srm
Organic Matter	14.8	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	41	mg/kg		10		SW6010B	03/17/09 02:50 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.14	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	7.4	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	1.0	meq/100g		0.2		SW6010B	03/17/09 04:23 / tao
Sodium Equivalents	0.4	meq/100g		0.2		SW6010B	03/17/09 04:23 / tao
Sulfate as S	57.5	mg/kg		0.3		ASA10-3	03/17/09 00:58 / kh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study
Report Date: 04/09/09

Lab ID: B09030591-004
Client Sample ID: Saltese S2-2 (4-5)
Matrix: Soil
Collection Date: 11/20/08
DateReceived: 03/09/09

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	SiL					ASA15-5	03/18/09 16:38 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	None					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	10	mg/kg		1		ASA24-5	03/18/09 10:03 / srm
Nitrate as N, KCL Extract	5	mg/kg		1		ASA33-8	03/18/09 13:06 / srm
Organic Matter	2.14	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	49	mg/kg		10		SW6010B	03/17/09 02:54 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.030	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	7.4	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	ND	meq/100g		0.2		SW6010B	03/17/09 04:27 / tao
Sodium Equivalents	ND	meq/100g		0.2		SW6010B	03/17/09 04:27 / tao
Sulfate as S	10.1	mg/kg		0.3		ASA10-3	03/17/09 01:10 / kh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study **Report Date:** 04/09/09

Lab ID: B09030591-005 **Collection Date:** 11/20/08
Client Sample ID: Saltese S4-1 (0-1) **DateReceived:** 03/09/09
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	L					ASA15-5	03/18/09 16:38 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	None					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	3	mg/kg		1		ASA24-5	03/18/09 10:22 / srm
Nitrate as N, KCL Extract	46	mg/kg		1		ASA33-8	03/18/09 13:07 / srm
Organic Matter	27.2	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	72	mg/kg		10		SW6010B	03/17/09 02:58 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.13	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	5.2	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	0.7	meq/100g		0.2		SW6010B	03/17/09 04:31 / tao
Sodium Equivalents	0.2	meq/100g		0.2		SW6010B	03/17/09 04:31 / tao
Sulfate as S	67.0	mg/kg		0.3		ASA10-3	03/17/09 01:21 / kh

Report Definitions: RL - Analyte reporting limit. MCL - Maximum contaminant level.
QCL - Quality control limit. ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study **Report Date:** 04/09/09

Lab ID: B09030591-006 **Collection Date:** 11/20/08
Client Sample ID: Saltese S4-2 (4-5) **DateReceived:** 03/09/09
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	N/A					ASA15-5	03/17/09 09:03 / srm
-Unable to analyze due to sample matrix							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	Slight					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	2	mg/kg		1		ASA24-5	03/18/09 10:23 / srm
Nitrate as N, KCL Extract	9	mg/kg		1		ASA33-8	03/18/09 13:08 / srm
Organic Matter	57.9	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	72	mg/kg		10		SW6010B	03/17/09 03:02 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.33	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	5.0	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	1.5	meq/100g		0.2		SW6010B	03/17/09 04:35 / tao
Sodium Equivalents	0.5	meq/100g		0.2		SW6010B	03/17/09 04:35 / tao
Sulfate as S	455	mg/kg		0.3		ASA10-3	03/17/09 01:33 / kh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study
Report Date: 04/09/09

Lab ID: B09030591-007
Client Sample ID: Saltese S5-1 (0-1)
Matrix: Soil
Collection Date: 11/20/08
DateReceived: 03/09/09

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	N/A					ASA15-5	03/17/09 09:03 / srm
-Unable to analyze due to sample matrix							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	None					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	2	mg/kg		1		ASA24-5	03/18/09 10:25 / srm
Nitrate as N, KCL Extract	122	mg/kg		1		ASA33-8	03/18/09 13:30 / srm
Organic Matter	57.2	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	100	mg/kg		10		SW6010B	03/17/09 03:05 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.56	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	4.5	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	2.9	meq/100g		0.2		SW6010B	03/17/09 04:39 / tao
Sodium Equivalents	0.8	meq/100g		0.2		SW6010B	03/17/09 04:39 / tao
Sulfate as S	659	mg/kg		0.3		ASA10-3	03/17/09 01:44 / kh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study
Report Date: 04/09/09

Lab ID: B09030591-008
Client Sample ID: Saltese S5-2 (4-5)
Matrix: Soil
Collection Date: 11/20/08
DateReceived: 03/09/09

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	N/A					ASA15-5	03/17/09 09:03 / srm
-Unable to analyze due to sample matrix							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	None					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	4	mg/kg		1		ASA24-5	03/18/09 10:26 / srm
Nitrate as N, KCL Extract	133	mg/kg		1		ASA33-8	03/18/09 13:10 / srm
Organic Matter	57.4	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	86	mg/kg		10		SW6010B	03/17/09 03:09 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.57	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	4.4	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	3.2	meq/100g		0.2		SW6010B	03/17/09 04:43 / tao
Sodium Equivalents	0.7	meq/100g		0.2		SW6010B	03/17/09 04:43 / tao
Sulfate as S	717	mg/kg		0.3		ASA10-3	03/17/09 02:42 / kh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study
Report Date: 04/09/09

Lab ID: B09030591-009
Client Sample ID: Saltese S6-1 (0-1)
Matrix: Soil
Collection Date: 11/20/08
DateReceived: 03/09/09

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	SiL					ASA15-5	03/18/09 16:38 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	None					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	ND	mg/kg		1		ASA24-5	03/18/09 10:28 / srm
Nitrate as N, KCL Extract	63	mg/kg		1		ASA33-8	03/18/09 13:12 / srm
Organic Matter	27.4	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	48	mg/kg		10		SW6010B	03/17/09 03:13 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.11	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	5.0	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	0.5	meq/100g		0.2		SW6010B	03/17/09 04:47 / tao
Sodium Equivalents	ND	meq/100g		0.2		SW6010B	03/17/09 04:47 / tao
Sulfate as S	37.5	mg/kg		0.3		ASA10-3	03/17/09 02:54 / kh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Client: PBS and J
Site Name: Saltese Flats - Wetlands Feasibility Study
Report Date: 04/09/09

Lab ID: B09030591-010
Client Sample ID: Saltese S6-2 (4-5)
Matrix: Soil
Collection Date: 11/20/08
DateReceived: 03/09/09

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Texture	Si					ASA15-5	03/18/09 16:38 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
CHEMICAL CHARACTERISTICS							
Lime, Semi-Quantitative	None					Visual	03/17/09 09:03 / srm
Phosphorus, Olsen	1	mg/kg		1		ASA24-5	03/18/09 10:11 / srm
Nitrate as N, KCL Extract	43	mg/kg		1		ASA33-8	03/18/09 13:13 / srm
Organic Matter	1.45	%		0.02		ASA29-3	03/18/09 11:03 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	110	mg/kg		10		SW6010B	03/17/09 03:17 / tao
WATER EXTRACTABLE CONSTITUENTS (1:10)							
Conductivity, 1:10	0.090	mmhos/cm		0.010		ASA10-3	03/17/09 09:03 / srm
pH, 1:10	4.7	s.u.		0.1		ASA10-3	03/17/09 09:03 / srm
Calcium Equivalents	ND	meq/100g		0.2		SW6010B	03/17/09 04:54 / tao
Sodium Equivalents	ND	meq/100g		0.2		SW6010B	03/17/09 04:54 / tao
Sulfate as S	38.2	mg/kg		0.3		ASA10-3	03/17/09 03:06 / kh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

Energy Laboratories Inc
Workorder Receipt Checklist

B09030591

PBS and J

Login completed by: Darwin C. Miller
Date and Time Received: 3/9/2009 6:00 AM

Reviewed by: Denise Ruby
Received by: lg

Reviewed Date: 3/9/2009 10:46:00 AM
Carrier name: Bus

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature:	11°C		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Contact and Corrective Action Comments:

Client included a Lawn and Garden Check-in sheet for Saltese - S3 and no smaple was received. Per client call, disregard sheet. Samples are at two depths, so 1 check-in sheet for two samples.

Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT- Provide as much information as possible.

Company Name: PBS&J	Project Name, PWS, Permit, Etc.: Saltese Flats - Wetlands Feasibility Study	Sample Origin State:	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address: 1120 Cedar Street Missoula, MT 59802-3911	Contact Name: Greg Howard	Phone/Fax: 406 532-7251	Email: ghoward@pbsj.com
Invoice Address: 1120 Cedar Street Missoula, MT 59802-3911	Invoice Contact & Phone: Chris Matt 406 532-7258	Purchase Order: 100002604	Quote/Bottle Order:

Special Report/Formats – ELI must be notified prior to sample submittal for the following:

☐ DW ☐ A2LA
☐ GSA ☐ EDD/EDT (Electronic Data)
☐ POTW/WWTP Format: _____
☐ State: _____ ☐ LEVEL IV
☐ Other: _____ ☐ NELAC

Number of Containers
Sample Type: A W S V B O
Air Water Soils/Solids Vegetation Bioassay Other

ANALYSIS REQUESTED

Lawn and Garden | SEE ATTACHED | Normal Turnaround (TAT)

R U S H

Contact ELI prior to RUSH sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: Bus
Cooler ID(s):
Receipt Temp 11 °C
On Ice: Yes (No)
Custody Seal (Y) N
Intact (Y) N
Signature Match (Y) N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Lawn and Garden	LABORATORY USE ONLY
1	Saltese S1-1 (0-1)	11/20/08		1-S	X	B09030591-001
2	Saltese S1-2 (4-5)	11/20/08		1-S	X	-002
3	Saltese S2-1 (0-1)	11/20/08		1-S	X	-003
4	Saltese S2-2 (4-5)	11/20/08		1-S	X	-004
5	Saltese S4-1 (0-1)	11/20/08		1-S	X	-005
6	Saltese S4-2 (4-5)	11/20/08		1-S	X	-006
7	Saltese S5-1 (0-1)	11/20/08		1-S	X	-007
8	Saltese S5-2 (4-5)	11/20/08		1-S	X	-008
9	Saltese S6-1 (0-1)	11/20/08		1-S	X	-009
10	Saltese S6-2 (4-5)	11/20/08		1-S	X	-010

~~Lower~~ ~~Cavlen sheet~~ ~~for~~ ~~Saltese S3~~

Custody Record MUST be Signed

Relinquished by (print): Greg Howard	Date/Time: 03/06/09 13:25	Signature: Greg Howard	Received by (print): / Date/Time: / Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print): / Date/Time: / Signature:
Sample Disposal: Return to Client: _____ Lab Disposal: _____			Received by Laboratory: 3-9-09 Date/Time: 6:00 Signature: Lisa Yancy

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

Appendix E

Wetland Delineation Maps, Forms, and Photos

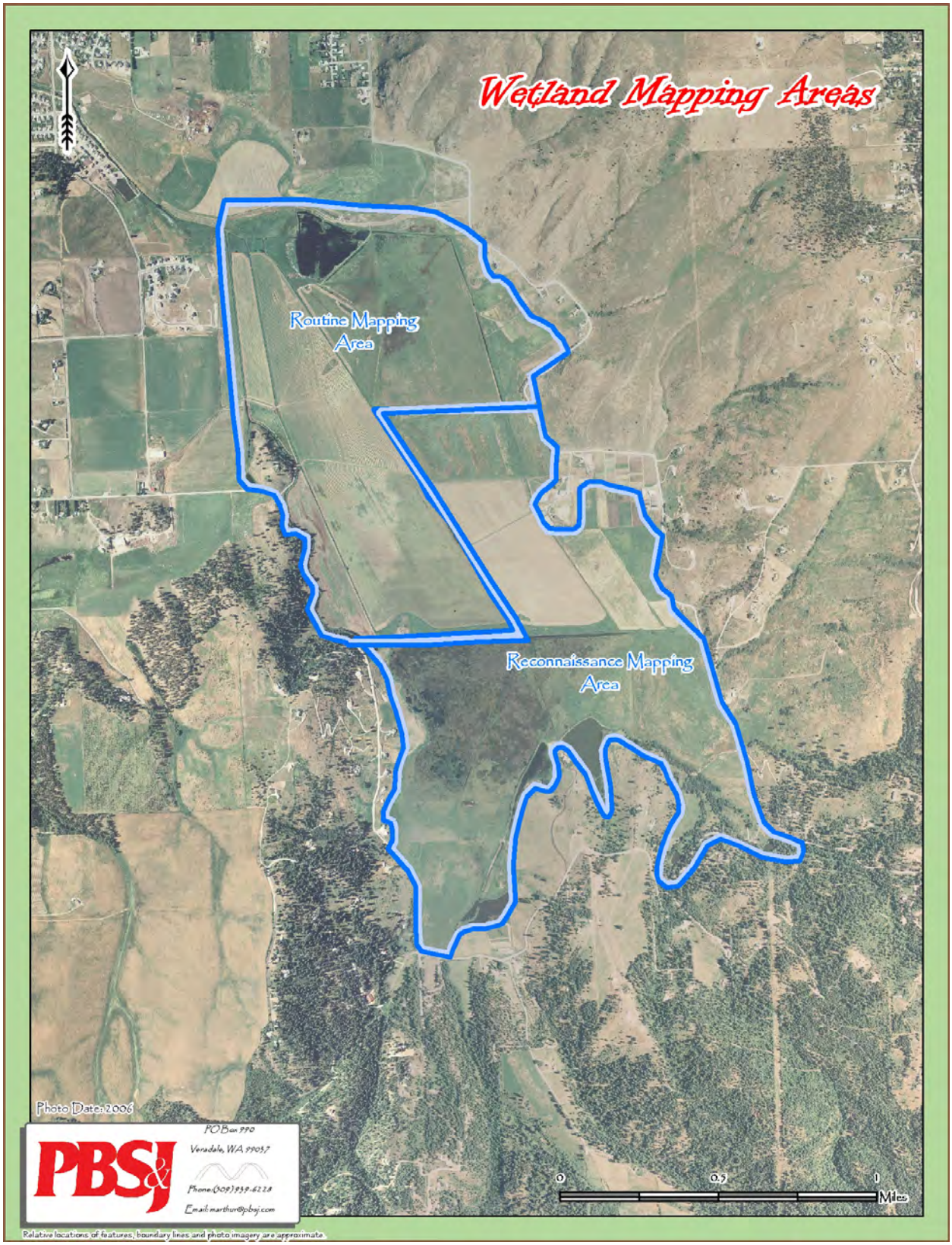


Figure E-1. Areas of Routine and Reconnaissance Wetland Mapping

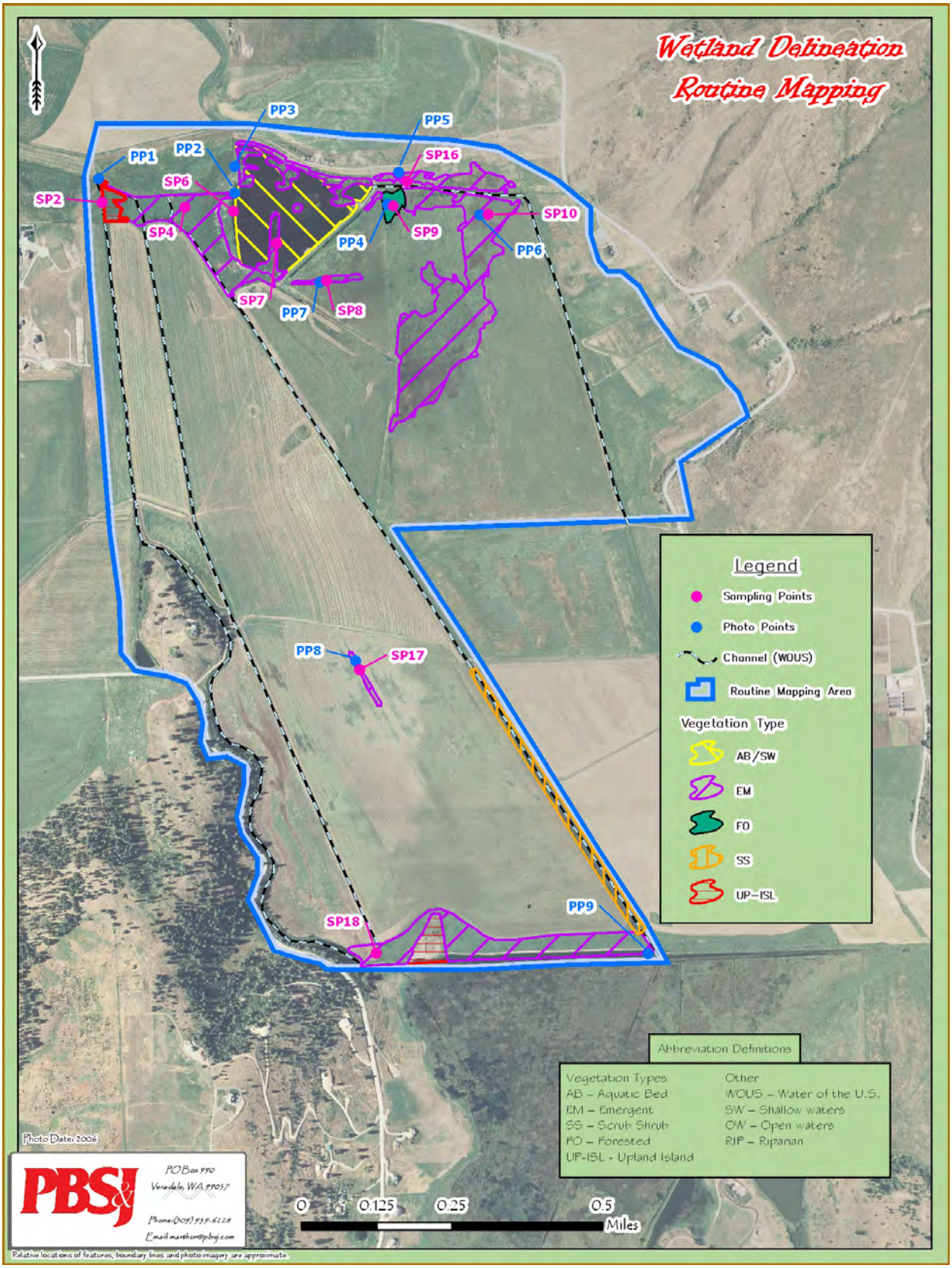


Figure E-2. Routine Wetland Mapping

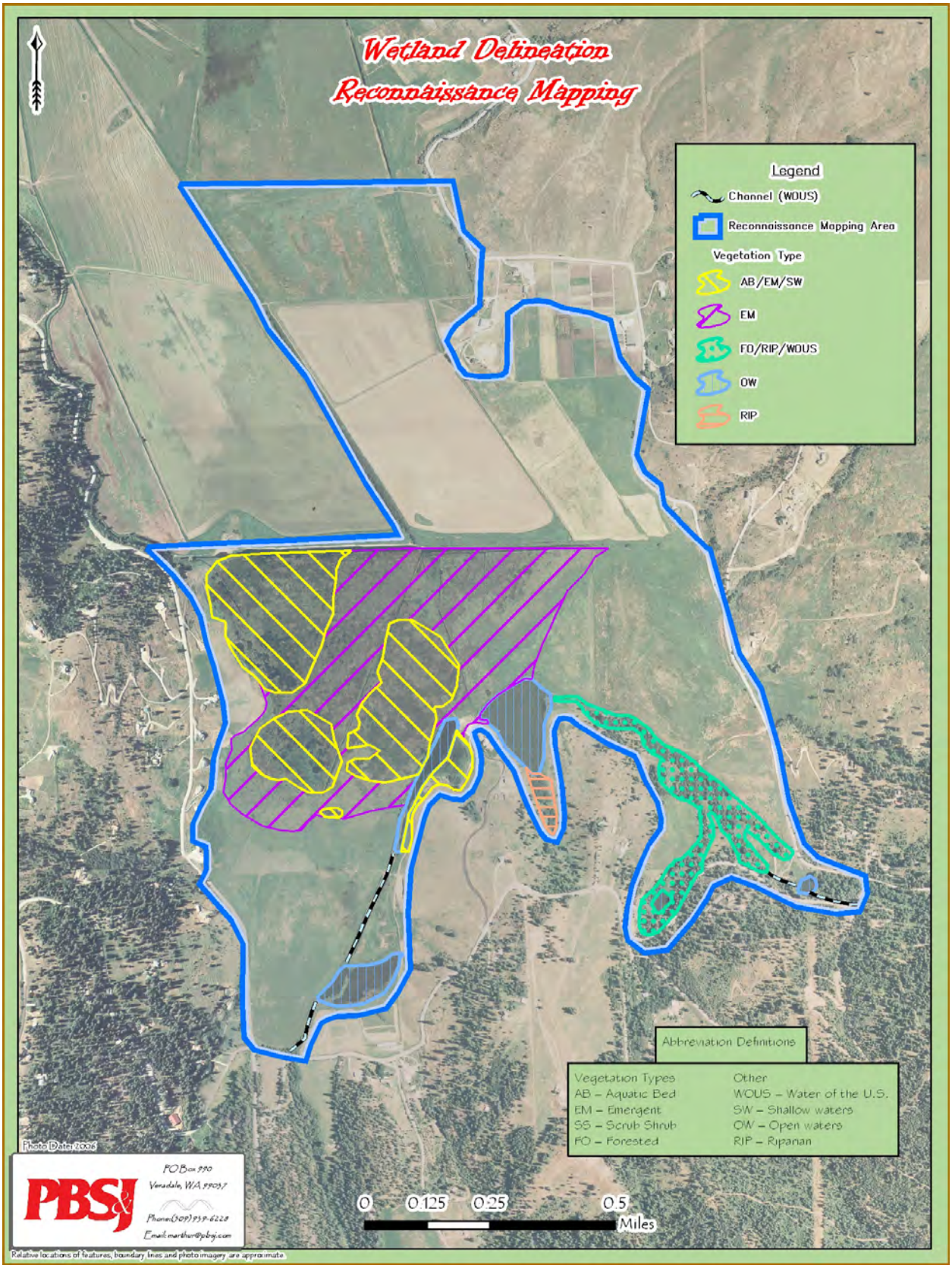


Figure E-3. Reconnaissance Wetland Mapping

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Saltese Flats | City/County: Spokane Valley / Spokane | Sampling Date: 9-23-08

Applicant/Owner: Spokane County | State: WA | Sampling Point: SP-10

Investigator(s): G. Howard | Section, Township, Range: Section 29, T25N, R45E

Landform (hillslope, terrace, etc.): Plains | Local relief (concave, convex, none): Concave | Slope (%): 2

Subregion (LRR): | Lat: 47°38'18.489"N | Long: 117°7'42.855"W | Datum: NAD 83

Soil Map Unit Name: Semiahmoo muck, drained | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐			
Hydric Soil Present?	Yes ☒	No ☐	**Is the Sampling Area within a Wetland?**	**Yes ☒**	**No ☐**
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks: **Sampling point considered within a wetland area. Area dominated by emergent vegetation type.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. *Scirpus validus*	70	Yes	OBL
2. *Typha latifolia*	15	No	OBL
3. *Sparganium emersum*	10	No	OBL
4. *Alisma plantago-aquatica*	5	No	OBL
5. *Phalaris arundinacea*	3	No	FACW
6.			
7.			
8.			
	103	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	3	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**1**	(A)
Total Number of Dominant Species Across All Strata:	**1**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:

__X__ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Area dominated by hydrophytic vegetation.

Project Site: Saltese Flats

SOIL Sampling Point: SP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10 YR 2/1	100					Loam	
8-12+	10 YR 2/2	100					Muck	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Area ponded or inundated for long period satisfying NRCS Hydric Soils Criteria # 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):
Water Table Present?	Yes	☐	No	☐	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicator present with oxidized rhizospheres and indication of surface water inundation earlier in the season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Saltese Flats City/County: Spokane Valley / Spokane Sampling Date: 9-23-08

Applicant/Owner: Spokane County State: WA Sampling Point: SP-16

Investigator(s): G. Howard Section, Township, Range: Section 29, T25N, R45E

Landform (hillslope, terrace, etc.): Plains Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Lat: 47°38'21.598"N Long: 117°7'53.092"W Datum: NAD 83

Soil Map Unit Name: Semiahmoo muck NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐			
Hydric Soil Present?	Yes ☒	No ☐	**Is the Sampling Area within a Wetland?**	**Yes ☒**	**No ☐**
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks: **Sampling point considered within a wetland area. Area dominated by emergent vegetation type.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. *Echinochloa crusgalli*	50	Yes	FACW
2. *Sparganium emersum*	20	Yes	OBL
3. *Typha latifolia*	15	No	OBL
4. *Bidens cernua*	10	No	FACW
5. *Cirsium arvense*	5	No	FACU
6. *Carex* sp.	1	No	FAC
7. *Epilobium ciliatum*	1	No	FACW
8. *Phalaris arundinacea*	1	No	FACW
	103	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	2	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**2**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:

__X__ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Area dominated by hydrophytic vegetation.

Project Site: Saltese Flats

SOIL Sampling Point: SP-16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 2/2	100					Loam	
3-12	10 YR 2/2	100					Loam	
12-15	10 YR 2/2	100					Muck	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Area ponded or inundated for long period satisfying NRCS Hydric Soils Criteria # 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☐ Depth (inches):

Water Table Present? Yes ☐ No ☐ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☐ Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicator present with oxidized rhizospheres and indication of surface water inundation earlier in the season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site:	Saltese Flats	City/County:	Spokane Valley / Spokane	Sampling Date:	9-23-08
Applicant/Owner:	Spokane County		State: WA	Sampling Point:	SP-17
Investigator(s):	G. Howard	Section, Township, Range:	Section 29, T25N, R45E		
Landform (hillslope, terrace, etc.):	Plains	Local relief (concave, convex, none):	Concave	Slope (%):	1
Subregion (LRR):	Lat:	47°37'39.516"N	Long:	117°8'1.895"W	Datum: NAD 83
Soil Map Unit Name:	Semiahmoo muck, drained		NWI classification:		

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: **Sampling point considered within a wetland area. Area dominated by emergent vegetation type and located in the farmed pasture field.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. *Phalaris arundinacea*	50	Yes	FACW
2. *Carex* sp.	20	Yes	FACW
3. *Echinochloa crusgalli*	10	No	
4. *Agrostis* sp.	5	No	
5. *Juncus ensifolius*	1	No	
6.			
7.			
8.			
	86	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	20	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**2**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:

__X__ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Area dominated by hydrophytic vegetation.

Project Site: Saltese Flats

SOIL

Sampling Point: SP-17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10 YR 2/1	100					Loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Area ponded or inundated for long period satisfying NRCS Hydric Soils Criteria # 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):
Water Table Present?	Yes	☐	No	☐	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches): 8

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicator present with soils saturated and indication of surface water inundation earlier in the season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site:	Saltese Flats	City/County:	Spokane Valley / Spokane	Sampling Date:	9-23-08
Applicant/Owner:	Spokane County		State: WA	Sampling Point:	SP-18
Investigator(s):	G. Howard	Section, Township, Range:	Section 29, T25N, R45E		
Landform (hillslope, terrace, etc.):	Plains	Local relief (concave, convex, none):	Concave	Slope (%):	2
Subregion (LRR):	Lat:	47°37'15.086"N	Long:	117°8'0.924"W	Datum: NAD 83
Soil Map Unit Name:	Semiahmoo muck			NWI classification:	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: **Sampling point considered within a wetland area. Area dominated by emergent vegetation type and located below the Morrison Diversion.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. *Juncus bufonius*	60		FACW
2. *Gnaphalium palustre*	20		FAC
3. *Echinochloa crusgalli*	15		FACW
4. *Polygonum* sp.	5		FACW
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	5	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**2**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:

__X__ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Area dominated by hydrophytic vegetation.

Project Site: Saltese Flats

SOIL

Sampling Point: SP-18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10 YR 2/1	100					Loam	
10-12+	10 YR 2/2	100					Muck	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Area ponded or inundated for long period satisfying NRCS Hydric Soils Criteria # 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☐ Depth (inches):

Water Table Present? Yes ☐ No ☐ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☐ Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicator present with oxidized rhizospheres, water stained leaves and indication of surface water inundation earlier in the season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site:	Saltese Flats	City/County:	Spokane Valley / Spokane	Sampling Date:	9-23-08
Applicant/Owner:	Spokane County		State: WA	Sampling Point:	SP-2
Investigator(s):	G. Howard	Section, Township, Range:	Section 29, T25N, R45E		
Landform (hillslope, terrace, etc.):	Plains	Local relief (concave, convex, none):	Concave	Slope (%):	1
Subregion (LRR):	Lat: 47°38'21.037"N	Long:	117°8'32.319"W	Datum:	NAD 83
Soil Map Unit Name:	Lakesol silt loam, 0 to 20 percent slopes		NWI classification:		

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: **Sampling point considered within a wetland area. Sampling point is within the bottom of a large ditch that serves as a conveyance system for irrigation waters and also seasonal fluctuation of ponding surface waters within Saltese Flats.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. Phalaris arundinacea	100	Yes	FACW
2. *Galium* sp.	1	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	101	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	**0**	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**1**	(A)
Total Number of Dominant Species Across All Strata:	**1**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:

__X__ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Hydrophytic vegetation present with a mono-culture of reed canarygrass.

Project Site: Saltese Flats

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					Mucky Loam	
10+	10YR 2/1	100					Silt Loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☒ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present with loamy mucky mineral (F1) and areas of ponding water with a long duration or frequency within the ditch bottom that satisfies NRCS Hydric Soil Criteria # 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☒	No	☐	Depth (inches): 3
Water Table Present?	Yes	☐	No	☐	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☐	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicator present with surface waters within the ditch.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Saltese Flats | City/County: Spokane Valley / Spokane | Sampling Date: 9-23-08

Applicant/Owner: Spokane County | State: WA | Sampling Point: SP-4

Investigator(s): G. Howard | Section, Township, Range: Section 29, T25N, R45E

Landform (hillslope, terrace, etc.): Slope | Local relief (concave, convex, none): None | Slope (%): 1-2

Subregion (LRR): | Lat: 47°38'20.209"N | Long: 117°8'21.768"W | Datum: NAD 83

Soil Map Unit Name: Semiahmoo muck, drained | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐		
Hydric Soil Present?	Yes ☒	No ☐	**Is the Sampling Area within a Wetland?**	**Yes ☒ No ☐**
Wetland Hydrology Present?	Yes ☒	No ☐		

Remarks: **Sampling point considered within a wetland area. Wetland site is a mono-culture of reed canarygrass that receives periodic or seasonal flooding from fluctuating water table near the Graham pond.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. *Phalaris arundinacea*	99	Yes	FACW
2. *Galium* sp.	1	No	
3.			
4.			
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	**0**	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Area dominated by mostly a single hydrophytic species of vegetation.

Project Site: Saltese Flats

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100					Loam	
8-15	10 YR 2/1	100					Loam	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present with thick dark surface and NRCS Hydric Soil Criteria # 4 for ponding or long frequency of surface water or high groundwater.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☒	No	☐	Depth (inches): 6
Water Table Present?	Yes	☐	No	☐	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☐	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicators present with oxidized rhizospheres observed during the delineation (Sept. 08) and extensive surface waters across the north end of the entire project observed during February to April 2009.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Saltese Flats City/County: Spokane Valley / Spokane Sampling Date: 9-23-08

Applicant/Owner: Spokane County State: WA Sampling Point: SP-6

Investigator(s): G. Howard Section, Township, Range: Section 29, T25N, R45E

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): Lat: 47°38'19.737"N Long: 117°8'15.472"W Datum: NAD 83

Soil Map Unit Name: Fresh water marsh NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?** **Yes** ☒ **No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: **Sampling point considered within a wetland area. Area dominated by emergent vegetation**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. *Eleocharis ovata*	30	Yes	OBL
2. *Gnaphalium palustre*	20	Yes	FAC
3. *Polygonum amphibium*	15	Yes	OBL
4. *Bidens cernua*	5	No	FACW
5. *Juncus bufonius*	5	No	FACW
6.			
7.			
8.			
	75	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	**25**	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**3**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__X__ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Area dominated by hydrophytic vegetation.

Project Site: Saltese Flats

SOIL

Sampling Point: SP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 2/1	100					Loam	
2-6	10 YR 2/2	100					Loam	
6-12	10 YR 3/3	100					Muck	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Area ponded or inundated for long periods satisfying NRCS Hydric Soils Criteria # 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):
Water Table Present?	Yes	☐	No	☐	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches): 0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicator present with saturated soils during the time of the investigation and indication of surface water earlier in the season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site:	Saltese Flats	City/County:	Spokane Valley / Spokane	Sampling Date:	9-23-08
Applicant/Owner:	Spokane County		State: WA	Sampling Point:	SP-7
Investigator(s):	G. Howard	Section, Township, Range:	Section 29, T25N, R45E		
Landform (hillslope, terrace, etc.):	Plains	Local relief (concave, convex, none):	Concave	Slope (%):	1
Subregion (LRR):	Lat: 47°38'16.885"N	Long:	117°8'10.208"W	Datum:	NAD 83
Soil Map Unit Name:	Fresh water marsh		NWI classification:		

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: **Sampling point considered within a wetland area. Area dominated by emergent vegetation type along fringe of Graham Pond. Site has fluctuating water levels throughout the season.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. *Typha latifolia*	60		OBL
2. *Polygonum amphibium*	20		
3. *Phalaris arundinacea*	10		
4. *Bidens cernua*	1		
5. *Gnaphalium palustre*	1		
6.			
7.			
8.			
	92	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	**10**	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**2**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Area dominated by hydrophytic vegetation.

Project Site: Saltese Flats

SOIL

Sampling Point: SP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 2/1	100					Loam	
2-10	10 YR 2/1	100					Loam	
10-15	10 YR 2/2	100					Muck	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Area ponded or inundated for long periods satisfying NRCS Hydric Soils Criteria # 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):
Water Table Present?	Yes	☐	No	☐	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicator present with soils saturated to ground surface and indication of surface water earlier in the season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site:	Saltese Flats	City/County:	Spokane Valley / Spokane	Sampling Date:	9-23-08
Applicant/Owner:	Spokane County		State: WA	Sampling Point:	SP-8
Investigator(s):	G. Howard	Section, Township, Range:	Section 29, T25N, R45E		
Landform (hillslope, terrace, etc.):	Plains	Local relief (concave, convex, none):	Concave	Slope (%):	1
Subregion (LRR):	Lat: 47°38'13.47"N	Long:	117°8'4.176"W	Datum:	NAD 83
Soil Map Unit Name:	Semiahmoo muck, drained		NWI classification:		

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐				
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?**	**Yes**	☒	**No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: **Sampling point considered within a wetland area. Area dominated by emergent vegetation type. Small area located within farmed pasture inundated during high water events.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. *Echinochloa crusgalli*	50	Yes	FACW
2. ***Carex* sp.**	20	Yes	FACW
3. *Rumex crispus*	5	No	FAC
4. *Phleum pratense*	5	No	FAC
5. *Gnaphalium palustre*	1	No	FAC
6.			
7.			
8.			
	81	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	20	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**2**	(A)
Total Number of Dominant Species Across All Strata:	**2**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:

__X__ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: **Area dominated by hydrophytic vegetation.**

Project Site: Saltese Flats

SOIL

Sampling Point: SP-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 2/1	100					Loam	
3-8	10 YR 2/1	100					Silt Loam	
8-12	10 YR 2/2	100					Muck	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Area ponded or inundated for long period satisfying NRCS Hydric Soils Criteria # 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):
Water Table Present?	Yes	☐	No	☐	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches): 0

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicator present with soils saturated to ground surface and indication of surface water earlier in the season.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Saltese Flats City/County: Spokane Valley / Spokane Sampling Date: 9-23-08

Applicant/Owner: Spokane County State: WA Sampling Point: SP-9

Investigator(s): G. Howard Section, Township, Range: Section 29, T25N, R45E

Landform (hillslope, terrace, etc.): Plains Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): Lat: 47°38'19.542"N Long: 117°7'54.996"W Datum: NAD 83

Soil Map Unit Name: Semiahmoo muck, drained NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampling Area within a Wetland?** **Yes** ☒ **No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: **Sampling point considered within a wetland area. Area dominated by forested vegetation type.**

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Popular sp.	70	Yes	FAC
2.			
3.			
4.			
	70	= Total Cover	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum			
1. *Bidens cernua*	40		
2. *Juncus bufonius*	20		
3. *Phalaris arundinacea*	20		
4. *Echinochloa crusgalli*	10		
5. *Ranunculus* sp.	5		
6.			
7.			
8.			
	95	= Total Cover	
Woody Vine Stratum			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum	5	% Cover of Biotic Crust	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**4**	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index worksheet:

Total %Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present?	**Yes**	☒	**No**	☐

Remarks: Area dominated by hydrophytic vegetation.

Project Site: Saltese Flats

SOIL

Sampling Point: SP-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 2/1	100					Loam	
6-12+	10 YR 2/2	100					Muck	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Area ponded or inundated for long period satisfying NRCS Hydric Soils Criteria # 4.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☒ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):
Water Table Present?	Yes	☐	No	☐	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicator present with soils saturated to ground surface and indication of surface water earlier in the season.

PP1. View looking south along conveyance system for irrigation returns and fluctuating surface waters within Saltese Flats. Emergent vegetation type dominated by reed canarygrass.

PP2. View looking south along the fringe of Graham Pond at areas dominated by emergent vegetation. Photo view shows vegetation break between areas inundated for a majority of the season along pond fringe and zone of reed canarygrass receiving less inundation.

PP3. View looking east across Graham Pond dominated by aquatic bed and emergent vegetation types.

PP4. View looking east within poplar stand. Area dominated by overstory of forested vegetation type and understory of emergent vegetation type.

PP5. View looking east across emergent vegetation type on the northern side of flats.

PP6. View looking south across emergent vegetation type dominated by bulrush.

PP7. View looking east across emergent vegetation type located in farmed pasture dominated by barnyard grass.

PP8. View looking show across emergent vegetation type within farmed pasture.

PP9. View looking southwest along the Morrison Diversion. Area dominated by aquatic bed and emergent vegetation types.

PP9. View looking southeast across the area upstream of the Morrison Diversion. Area dominated by aquatic bed and emergent vegetation types.

Appendix F

Surface Water Levels and Discharge Data and Groundwater Elevation Data

Table F-1. Surface Water Stage and Discharge Data

Sites Above Saltese Flats

Site:	SC-1			UT-1			QC-1			MP-1			Culverts on East side of Saltese Flats				
Name:	Saltese Creek Inlet			Unnamed Tributary			Quinnamose Creek			Morrison Pond			C-1	C-2	C-3	C-4	C-5
Elev[1]:	*2075*			*2165*			*2155*			*2060*							
Date	Stage	Elev	Disch.	Stage	Elev	Disch.	Stage	Elev	Disch.	Stage	Elev	Disch.	Disch.	Disch.	Disch.	Disch.	Disch.
07/31/08	-----	-----	>0	-----	-----	>0	-----	-----	>0	-----	-----	**0**	**0**	**0**	**0**	**0**	**0**
11/03/08	0.42	2075.42	**0.04**	0.40	2165.40	**0.10**	0.49	2155.49	**0.09**	-----	-----	abt 0.01	**0**	**0**	**0**	**0**	**0**
11/18/08	0.51	2075.51	NA[2]	0.37	2165.37	**0.09**	0.53	2155.53	**0.08**	1.04	2061.04	**0.63**	**0**	**0**	**0**	**0**	**0**
01/08/09	-----	-----	-----	0.52	2165.52	0.63	Frzn	-----	-----	NM	-----	-----	NM	NM	NM	NM	NM
01/12/09	0.99	2075.99	**0.60**	0.40	2165.40	**0.25**	0.57	2155.57	**0.52**	1.40	2061.40	**1.81**	NM	NM	NM	NM	NM
04/21/09	1.54	2076.54	NA	0.78	2165.78	4.10	1.10	2156.10	5.00	1.28	2061.28	1.52	NM[3]	NM	NM	NM	NM
04/26/09	NM	-----	NA	0.66	2165.66	2.80	1.04	2156.04	4.50	NM	-----	-----	NM[3]	NM[3]	**0**	**0**	**0**
04/29/09	NM	-----	NA	0.62	2165.62	1.75	0.98	2155.98	4.25	NM	-----	-----	NM	NM	NM	NM	NM
05/05/09	1.28	2076.28	**3.40**	0.64	2165.64	**2.37**	0.96	2155.96	**4.15**	1.26	2061.26	**1.46**	NM	NM	NM	NM	NM
06/06/09	NM	-----	NA	0.58	2165.58	0.99	0.68	2155.68	2.38	NM	-----	-----	NM	NM	NM	NM	NM
06/10/09	0.68	2075.68	**1.32**	0.58	2165.58	**0.99**	0.61	2155.61	**1.86**	0.78	2060.78	**0.37**	NM	NM	NM	NM	NM

Sites On Saltese Flats

Site:	SC-2			SC-3			SC-4			SC-5			GP-1	
Name:	Far West Channel			West Channel			Central Channel			East Channel			Graham Pond	
Elev[1]:	*2038*			*2038*			NA			NA			*2040*	
Date	Stage	Elev	Disch.	Stage	Elev	Disch.	Stage	Elev	Disch.	Stage	Elev	Disch.	Stage	Elev
07/31/08	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	NM	-----
11/03/08	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	NM	-----
11/18/08	2.28	2040.28	-----	0.75	2038.75	-----	-----	-----	-----	-----	-----	-----	1.87	2041.87
01/08/09	NM	-----	NA	NM	-----	NA	-----	-----	-----	-----	-----	-----	NM	-----
01/12/09	2.92	2040.92	NA	3.32	2041.32	NA	-----	-----	-----	-----	-----	-----	3.24	2043.24
04/21/09	1.30	2039.3	NA	2.26	2040.26	NA	-----	-----	-----	-----	-----	-----	NM[4]	-----
04/26/09	NM	-----	NA	NM	-----	NA	-----	-----	-----	-----	-----	-----	NM[4]	-----
04/29/09	NM	-----	NA	NM	-----	NA	-----	-----	-----	-----	-----	-----	NM[4]	-----
05/05/09	2.45	2040.45	NA	2.20	2040.2	NA	-----	-----	-----	-----	-----	-----	NM[4]	-----
06/06/09	NM	-----	NA	NM	-----	NA	-----	-----	-----	-----	-----	-----	NM	-----
06/10/09			NA			NA	-----	-----	-----	-----	-----	-----	NM	-----

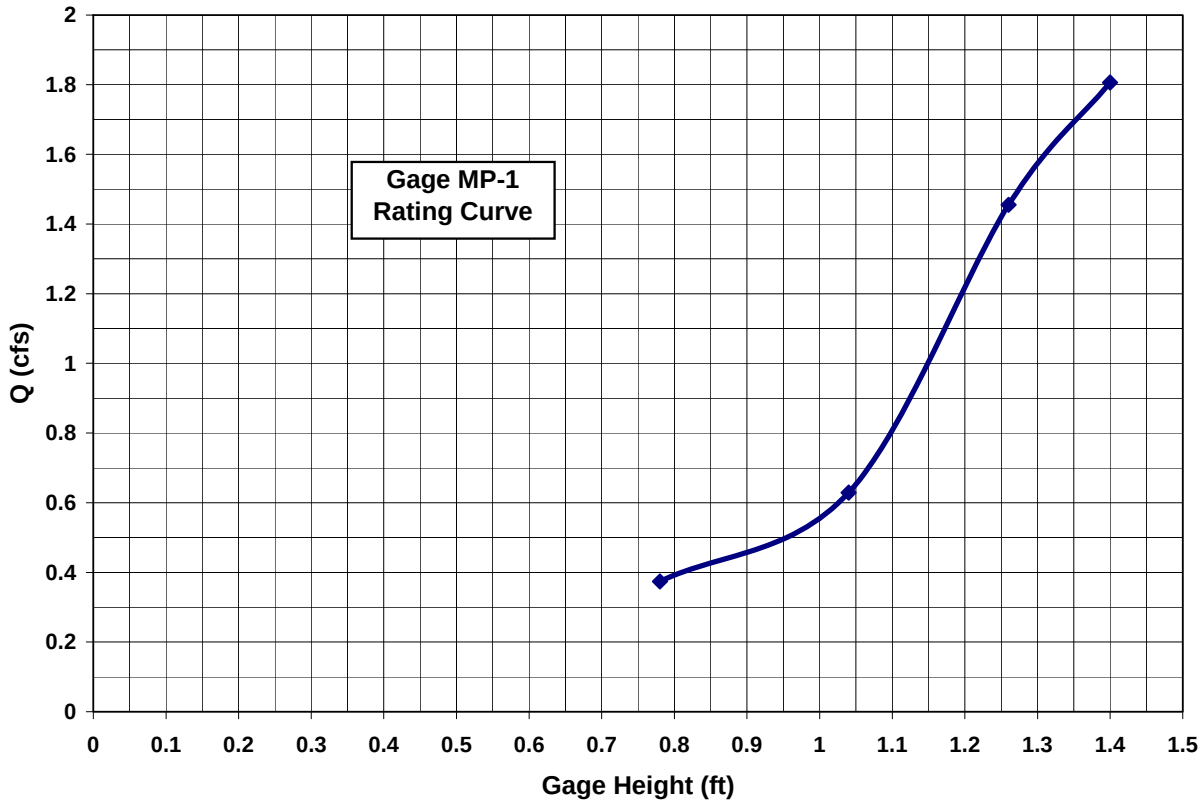
Sites Below Saltese Flats

Site:	SC-6			SC-7			SL-1
Name:	Saltese Creek at Church			Saltese Creek at Steen Rd			Shelley Lake
Elev[1]:	*2040*			*2017*			
Date	Stage	Elev	Disch.	Stage	Elev	Disch.	Stage
07/31/08	-----	-----	**0**	-----	-----	**0**	See Separate Table
11/03/08	-----	-----	**0**	-----	-----	**0**	
11/18/08	0.60	2040.60	**0**	-----	-----	**0**	
01/08/09	2.95	2042.95	NA	-----	-----	NM	
01/12/09	3.02	2043.02	NA	0.74	2017.74	**7.90**	
04/21/09	1.66	2041.66	NA	0.90	2017.90	11.8	
04/26/09	1.48	2041.48	NA	0.80	2017.80	9.60	
04/29/09	1.40	2041.40	NA	0.70	2017.70	6.68	
05/05/09	1.00	2041.00	**3.32**	0.56	2017.56	**2.64**	
06/06/09	0.99	2040.99	NA	0.36	2017.36	0.45	
06/10/09	0.50	2040.50	NA	0.32	2017.32	**0.07**	

Stage in ft, elevation in ft MSL, discharge in cfs
Bold discharge values are actual measurements, others from rating curves
Shaded value beyond curve limts, discharge estimated

----- Gage not installed or elevation not available
NA Discharge Not Available (curve not yet established)
NM Not measured or site not visited

1 Survey elevations in italics are estimated from USGS Topo Map
2 Gage removed, reinstalled 1/12/09
3 Not measured but flowing
4 Gage completely submerged


Gage MP-1
Rating Curve
Q (cfs)
Gage Height (ft)
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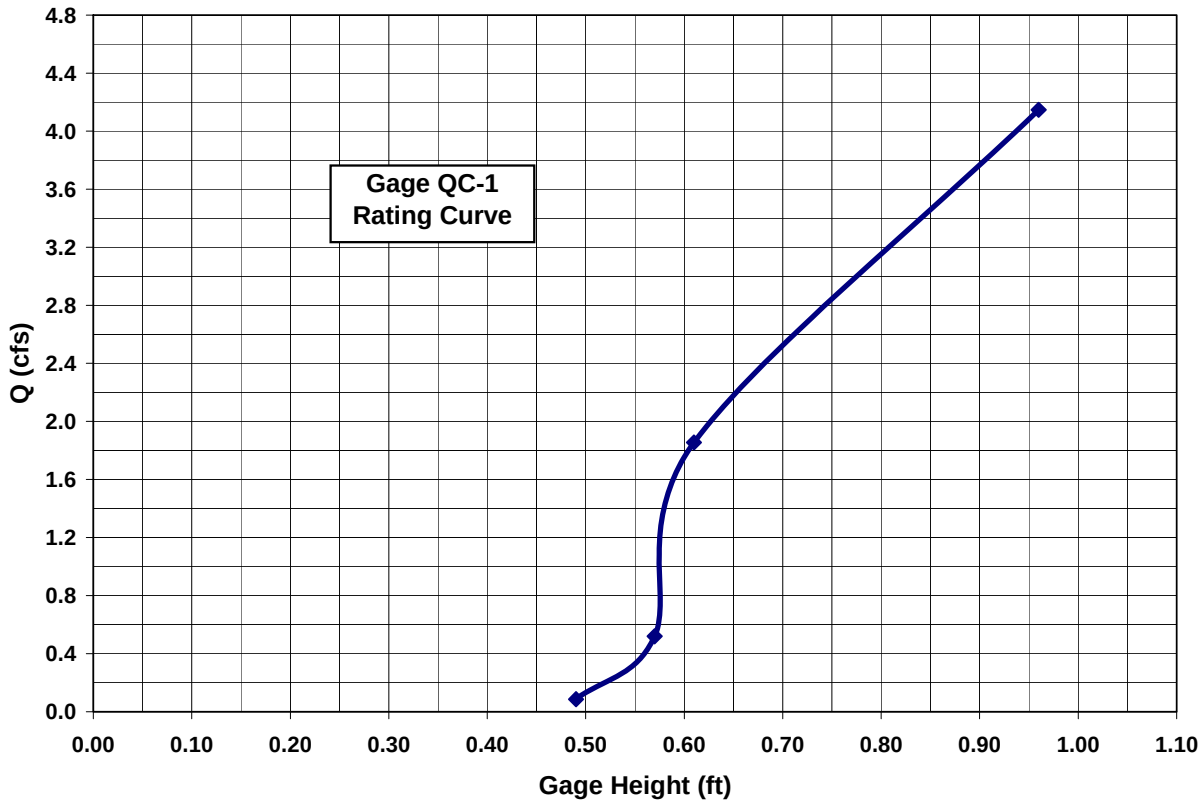
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5


Gage QC-1
Rating Curve
Q (cfs)
Gage Height (ft)
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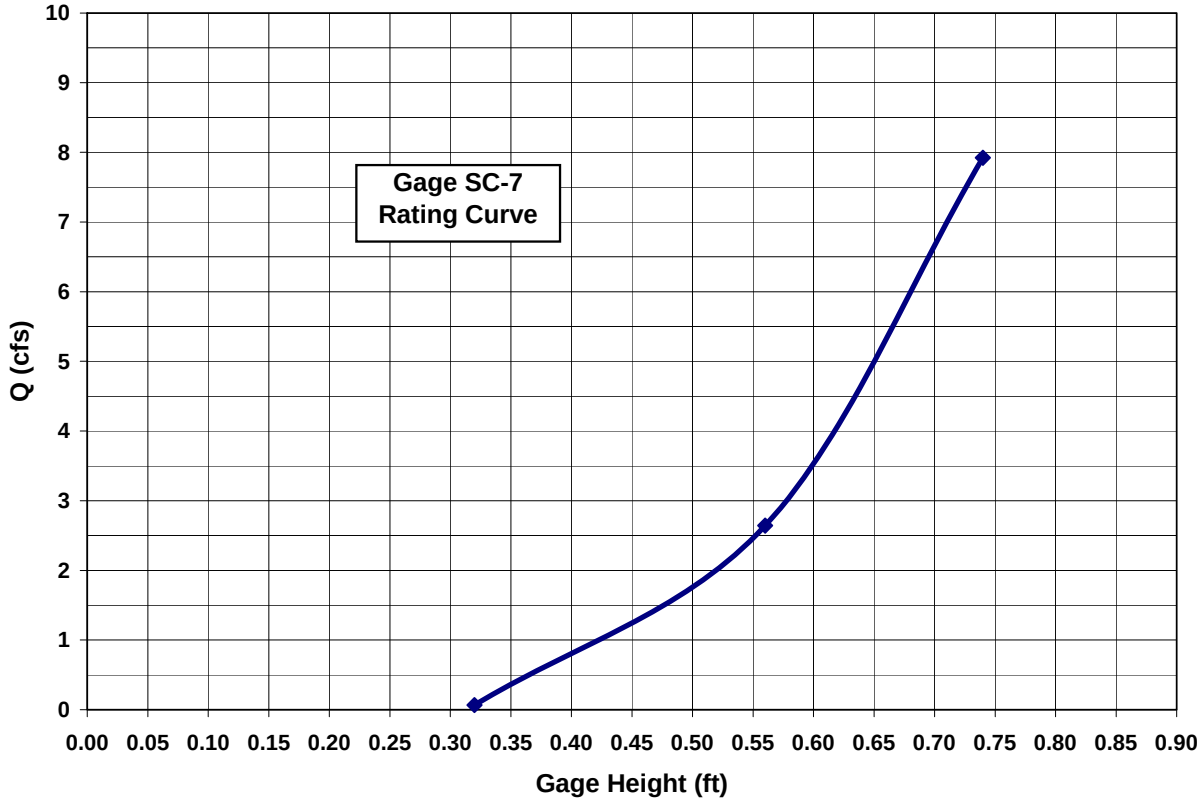
0.8
1.2
1.6
2.0
2.4
2.8
3.2
3.6
4.0
4.4
4.8
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10


Gage SC-7
Rating Curve
Q (cfs)
Gage Height (ft)
0
1
2
3
4
5
6
7
8
9
10
0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90

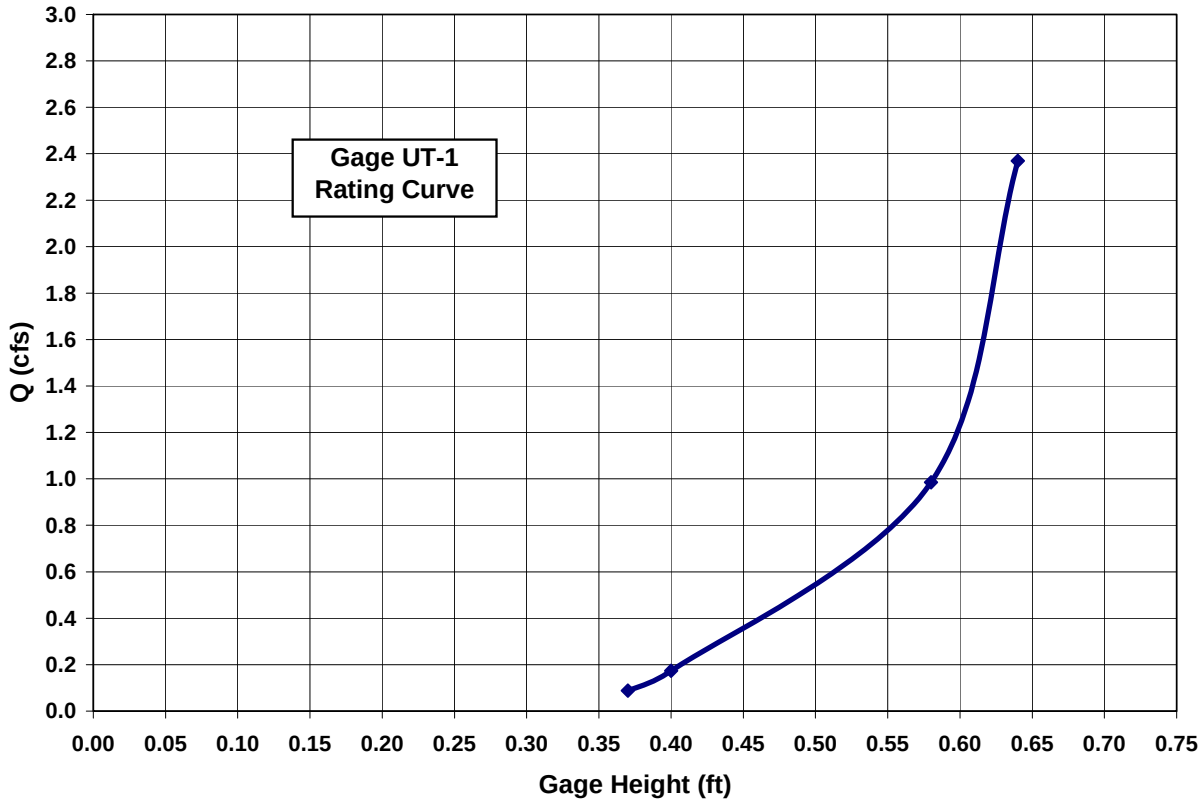

Gage UT-1
Rating Curve
Q (cfs)
Gage Height (ft)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2.8
3.0
0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60 0.65 0.70 0.75

Table F-2. Groundwater Depth to Water and Elevation Data

Saltese Flats Shallow Well Monitoring Data

Well:	SFW-1		SFW-2		SFW-3		SFW-4		SFW-5		SFW-6		SFW-7	
Ground Elev:	2042.36		2045.42		2043.41		2041.18		2042.38		2044.14		2044.72	
TOC Elev:	2042.06		2045.11		2042.98		2040.99		2041.97		2043.72		2044.34	
Date	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]
11/21/08	Dry	----	3.46	2041.96	3.84	2039.57	4.76	2036.42	3.81	2038.57	4.07	2040.07	1.75	2042.97
01/31/09	4.20	2038.16	3.10	2042.32	2.35	2041.06	2.05	2039.13	1.95	2040.43	1.21	2042.93	0.92	2043.80
04/21/09	2.01	2040.35	----	----	1.67	2041.74	0.32	2040.86	----	----	----	----	0.87	2043.85
05/02/09	3.32	2039.04	2.39	2043.03	1.92	2041.49	0.96	2040.22	0.96	2041.42	0.61	2043.53	0.66	2044.06
06/23/09	2.72	2039.64	----	----	2.91	2040.50	1.47	2039.71	2.91	2039.47	1.21	2042.93	----	----

Well:	SFW-8		SFW-9		SFW-10		SFW-11		SFW-12		SFW-13		SFW-14	
Ground Elev:	2040.66		2039.95		2040.63		2040.45		2043.09		2044.34		2045.97	
TOC Elev:	2040.19		2039.65		2040.42		2040.09		2042.77		2043.82		2045.60	
Date	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]	DTW[1]	Elev[2]
11/21/08	4.82	2035.84	3.43	2036.52	4.02	2036.61	4.27	2036.18	3.54	2039.55	3.77	2040.57	3.41	2042.56
01/31/09	1.82	2038.84	1.15	2038.80	3.11	2037.52	1.90	2038.55	1.77	2041.32	2.17	2042.17	1.67	2044.30
04/21/09	----	----	----	----	----	----	----	----	1.07	2042.02	----	----	----	----
05/02/09	0.55	2041.81	0	2039.95	0.82	2042.59	1.18	2040.00	1.46	2040.92	2.71	2041.43	1.51	2043.21
06/23/09	1.79	2040.57	0.42	2039.53	2.35	2041.06	----	----	2.73	2039.65	2.33	2041.81	1.82	2042.90

1 Depth to water from ground surface
2 Groundwater elevation in ft above mean sea level

Appendix G

Water Budget Scenarios

Table G-1. Water Budget: Mean Values

Saltese Average Climate Conditions-Mean Values

Inputs	Value
Area (Sq. Miles)	10.0
Basin Relief (x10^3 feet)	3
Basin Slope	0.14
Mean PPT (inches)	19
Mean Basin elevation (x10^3 feet)	2.7
% elevation >6000 ft	0
Basin Perimeter (miles)	10.0
Project Area (acres)	720

21.9

Inputs	Value
Aquifer Input X-Sec (ft2)	5000
Aquifer Input Gradient	0.01
Aquifer Input K (ft/day)	20
Aquifer Output X-Sec (ft2)	80000
Aquifer Output Gradient	0.005
Aquifer Output K (ft/day)	100
Aquifer Vertical Leak K (ft/day)	0.0005

Yellow = Inputs
Blue = Fixed or Calculated

21.7

Month	Inputs			Sum Inputs	Outputs			Sum Outputs	Change Groundwater	Change Storage	Surface Water	Net	
	Precip (in/mo)	GW (ac-ft)	Streamflow (cfs)	(ac-ft)	ET (in/mo)	GW Leakage (ac-ft/mo)	GW Flux (ac-ft/mo)	(ac-ft)	(ft)	(ac-ft)	%	(ac-ft)	(cfs)
1	2.35	0.69	0.79	189	0	10.8	27.5	38.3	0.00	0.0	100%	151	2.45
2	1.82	0.69	0.62	147	0	10.8	27.5	38.3	0.00	0.0	100%	109	1.77
3	1.63	0.69	0.92	153	0	10.8	27.5	38.3	0.50	144.0	100%	-29	-0.47
4	1.31	0.69	11.93	795	3.73	10.8	27.5	262.0	1.00	288.0	100%	245	3.99
5	1.68	0.69	15.30	1020	5.82	10.8	27.5	387.3	1.50	432.0	100%	200	3.26
6	1.43	0.69	6.12	454	6.86	10.8	27.5	449.7	0.50	144.0	100%	-140	-2.28
7	0.65	0.69	3.16	229	9.02	10.8	27.5	579.8	-1.00	-288.0	100%	-63	-1.02
8	0.74	0.69	1.81	154	8.18	10.8	27.5	528.9	-1.00	-288.0	100%	-87	-1.41
9	0.93	0.69	1.37	139	5.13	10.8	27.5	346.0	-0.75	-216.0	100%	9	0.14
10	1.38	0.69	1.99	203	0	10.8	27.5	38.3	-0.50	-144.0	100%	309	5.02
11	2.48	0.69	1.12	216	0	10.8	27.5	38.3	-0.25	-72.0	100%	250	4.07
12	2.61	0.69	0.82	206	0	10.8	27.5	38.3	0.00	0.0	100%	168	2.73
Average	1.58	0.69	3.83	325.5	3.2	10.8	27.5	232.0	0.0	0.0		93.5	1.5
Sum	19	8.3	45.95	3905.4	38.7	129.6	330.6	2783.9	0.0	0.0		1121.6	18.2
Ac-ft/yr	1140	8.3	2720	3905.4	2324	129.6	330.6	2783.9				1084.9	

Table G-2. Water Budget: Dry (q90)

Saltese Average Climate Conditions-Dry (q90)

Inputs	Value
Area (Sq. Miles)	10.0
Basin Relief (x10^3 feet)	3
Basin Slope	0.14
Mean PPT (inches)	19
Mean Basin elevation (x10^3 feet)	2.7
% elevation >6000 ft	0
Basin Perimeter (miles)	10.0
Project Area (acres)	720

21.9

Inputs	Value
Aquifer Input X-Sec (ft2)	5000
Aquifer Input Gradient	0.01
Aquifer Input K (ft/day)	20
Aquifer Output X-Sec (ft2)	80000
Aquifer Output Gradient	0.005
Aquifer Output K (ft/day)	100
Aquifer Vertical Leak K (ft/day)	0.0005

Yellow = Inputs
Blue = Fixed or Calculated

	Inputs			Sum	Outputs			Sum	Change	Change	Surface	Net	
Month	Precip (in/mo)	GW (ac-ft)	Streamflow (cfs)	Inputs (ac-ft)	ET (in/mo)	GW Leakage (ac-ft/yr)	GW Flux (ac-ft/mo)	Outputs (ac-ft)	Groundwater (ft)	Storage (ac-ft)	Water %	(ac-ft)	(cfs)
1	1.61	0.69	0.35	118.3	0	10.8	27.5	38.3	0.00	0.0	100%	80	1.30
2	1.24	0.69	0.37	97.6	0	10.8	27.5	38.3	0.00	0.0	100%	59	0.96
3	1.11	0.69	0.46	95.2	0	10.8	27.5	38.3	0.50	144.0	100%	-87	-1.42
4	0.90	0.69	2.76	219.9	3.73	10.8	27.5	262.0	1.00	288.0	100%	-330	-5.37
5	1.15	0.69	3.21	262.0	5.82	10.8	27.5	387.3	1.50	432.0	100%	-557	-9.06
6	0.98	0.69	2.14	187.6	6.86	10.8	27.5	449.7	0.50	144.0	100%	-406	-6.60
7	0.44	0.69	0.98	86.3	9.02	10.8	27.5	579.8	-1.00	-288.0	100%	-205	-3.34
8	0.51	0.69	0.65	70.3	8.18	10.8	27.5	528.9	-1.00	-288.0	100%	-171	-2.78
9	0.64	0.69	0.53	71.0	5.13	10.8	27.5	346.0	-0.75	-216.0	100%	-59	-0.96
10	0.94	0.69	0.91	111.7	0	10.8	27.5	38.3	-0.50	-144.0	100%	217	3.54
11	1.70	0.69	0.77	148.9	0	10.8	27.5	38.3	-0.25	-72.0	100%	183	2.97
12	1.78	0.69	0.55	140.8	0	10.8	27.5	38.3	0.00	0.0	100%	102	1.67
Average	1.08	0.69	1.14	134.1	3.2	10.8	27.5	232.0	0.0	0.0		-98	-1.6
Sum	13	8.26	13.69	1609.6	38.7	129.6	330.6	2783.9	0.0	0.0		-1174	-19.1
(ac-ft-yr)	780	8.26	797	1609.6	2324	129.6	330.6	2783.9					

Table G-3. Water Budget: Wet (q10)

Saltese Average Climate Conditions-Wet (q10)

Inputs	Value
Area (Sq. Miles)	21.0
Basin Relief (x10^3 feet)	3
Basin Slope	0.14
Mean PPT (inches)	19
Mean Basin elevation (x10^3 feet)	2.7
% elevation >6000 ft	0
Basin Perimeter (miles)	21.0
Project Area (acres)	720

21.9

Inputs	Value
Aquifer Input X-Sec (ft2)	5000
Aquifer Input Gradient	0.01
Aquifer Input K (ft/day)	20
Aquifer Output X-Sec (ft2)	80000
Aquifer Output Gradient	0.005
Aquifer Output K (ft/day)	100
Aquifer Vertical Leak K (ft/day)	0.0005

Yellow = Inputs
Blue = Fixed or Calculated

	Inputs			Sum	Outputs			Sum	Change	Change	Surface	Net		Augmented	
Month	Precip (in/mo)	GW (ac-ft)	Streamflow (cfs)	Inputs (ac-ft)	ET (in/mo)	GW Leakage (ac-ft/mo)	GW Flux (ac-ft/mo)	Outputs (ac-ft)	Groundwater (ft)	Storage (ac-ft)	Water %	(ac-ft)	(cfs)	(cfs)	(ac-ft)
1	3.34	0.69	2.61	357.6	0	10.8	27.5	38.3	0.00	0.0	100%	319.3	5.19	5.19	312
2	2.58	0.69	2.00	275.6	0	10.8	27.5	38.3	0.00	0.0	100%	237.3	3.86	3.86	232
3	2.31	0.69	3.19	331.1	0	10.8	27.5	38.3	0.50	360.0	100%	292.7	4.76	4.76	286
4	1.86	0.69	52.11	3238.7	3.73	10.8	27.5	262.0	1.00	720.0	100%	2256.7	36.70	71.27	4276
5	2.38	0.69	67.14	4171.8	5.82	10.8	27.5	387.3	1.50	1080.0	100%	2704.5	43.99	84.74	5084
6	2.03	0.69	23.01	1503.1	6.86	10.8	27.5	449.7	0.50	360.0	100%	693.4	11.28	39.22	2353
7	0.92	0.69	15.21	968.9	9.02	10.8	27.5	579.8	-1.00	-720.0	100%	1109.1	18.04	28.15	1689
8	1.06	0.69	8.92	599.1	8.18	10.8	27.5	528.9	-1.00	-720.0	100%	790.1	12.85	22.83	1370
9	1.32	0.69	6.53	471.9	5.13	10.8	27.5	346.0	-0.75	-540.0	100%	665.8	10.83	23.76	1426
10	1.96	0.69	6.46	506.0	0	10.8	27.5	38.3	-0.50	-360.0	100%	827.6	13.46	29.46	1767
11	3.52	0.69	2.87	384.0	0	10.8	27.5	38.3	-0.25	-180.0	100%	525.7	8.55	8.55	513
12	3.71	0.69	2.22	356.3	0	10.8	27.5	38.3	0.00	0.0	100%	317.9	5.17	5.17	310
Average	2.25	0.69	16.02	1097.0	3.2	10.8	27.5	232.0	0.0	0.0		895.0	14.6	36.22	2173
Sum	27	8.26446281	192.27	13164.2	38.7	129.6	330.6	2783.9	0.0	0.0		10740.4	174.7	196.34	11780
(ac-ft-yr)	1620	8.26	11436	13164.2	2324	129.6	330.6	2783.9							

Table G-4. Water Budget: Reclaimed Water Scenarios

Saltese Average Climate Conditions-Reclaimed Water Scenarios

Inputs	Value
Area (Sq. Miles)	10.0
Basin Relief (x10^3 feet)	3
Basin Slope	0.14
Mean PPT (inches)	19
Mean Basin elev (x10^3 feet)	2.7
% elevation >6000 ft	0
Basin Perimeter (miles)	10.0
Project Area (acres)	720

21.9

Inputs	Value
Aquifer Input X-Sec (ft2)	5000
Aquifer Input Gradient	0.01
Aquifer Input K (ft/day)	20
Aquifer Output X-Sec (ft2)	80000
Aquifer Output Gradient	0.005
Aquifer Output K (ft/day)	100
Aquifer Vertical Leak K (ft/day)	0.0005

Yellow = Inputs
Blue = Fixed or Calculated

21.875

	Inputs			Sum	Outputs			Sum	Change	Change	Surface	Net		Net (No	Reclaimed Water Scenarios					
Month	Precip (in/mo)	GW (ac-ft)	Stream Flow (cfs)	Inputs (ac-ft)	ET (in/mo)	GW Lkg. (in/month)	GW Flux (ac-ft/mo)	Outputs (ac-ft)	GW (ft)	Storage (ac-ft)	Water %	(ac-ft)	(cfs)	Storage) (ac-ft)	8 mgd (cfs)	12 mgd (cfs)	14 mgd (cfs)	8 mgd (ac-ft)	12 mgd (ac-ft)	14 mgd (ac-ft)
1	2.35	0.69	0.79	188.9	0	10.8	27.5	38.3	0.00	0.0	100%	150.6	2.45	150.6	2.4	2.4	2.4	147	147	147
2	1.82	0.69	0.62	147.2	0	10.8	27.5	38.3	0.00	0.0	100%	108.8	1.77	108.8	1.8	1.8	1.8	106	106	106
3	1.63	0.69	0.92	153.4	0	10.8	27.5	38.3	0.50	144.0	100%	-29.0	-0.47	115.0	-0.5	-0.5	-0.5	-28	-28	-28
4	1.31	0.69	11.93	795.3	3.73	10.8	27.5	262.0	1.00	288.0	100%	245.3	3.99	533.3	21.3	27.5	30.6	1276	1647	1833
5	1.68	0.69	15.30	1019.5	5.82	10.8	27.5	387.3	1.50	432.0	100%	200.2	3.26	632.2	22.9	29.1	32.2	1375	1746	1932
6	1.43	0.69	6.12	453.7	6.86	10.8	27.5	449.7	0.50	144.0	100%	-140.0	-2.28	4.0	12.4	18.6	21.7	747	1118	1304
7	0.65	0.69	3.16	229.2	9.02	10.8	27.5	579.8	-1.00	-288.0	100%	-62.6	-1.02	-350.6	6.5	12.7	15.8	392	763	949
8	0.74	0.69	1.81	154.2	8.18	10.8	27.5	528.9	-1.00	-288.0	100%	-86.7	-1.41	-374.7	6.1	12.3	15.4	368	739	925
9	0.93	0.69	1.37	138.6	5.13	10.8	27.5	346.0	-0.75	-216.0	100%	8.5	0.14	-207.5	8.9	15.1	18.2	535	907	1092
10	1.38	0.69	1.99	202.9	0	10.8	27.5	38.3	-0.50	-144.0	100%	308.6	5.02	164.6	15.1	21.3	24.4	907	1279	1464
11	2.48	0.69	1.12	216.4	0	10.8	27.5	38.3	-0.25	-72.0	100%	250.0	4.07	178.0	4.1	4.1	4.1	244	244	244
12	2.61	0.69	0.82	206.1	0	10.8	27.5	38.3	0.00	0.0	100%	167.8	2.73	167.8	2.7	2.7	2.7	164	164	164
Average	1.58	0.69	3.83	325.5	3.2	10.8	27.5	232.0	0.0	0.0		93.5	1.5	93.5	8.7	12.3	14.1	519.4	736.0	844.4
Sum	19	8.264463	45.95	3905.4	38.7	129.6	330.6	2783.9	0.0	0.0		1121.6	18.2	1121.6	103.9	147.2	168.9	6233	8832	10132
(ac-ft-yr)	1140	8.26	2720	3905.4	2324	129.6	330.6	2783.9												

Note: these options assume steady state is no storage change because inflows will fill available capacity in Flats.