

Appendix A



STORM EVENT REPORT #1
For
Non-Dry Dock Stormwater Monitoring
Conducted at
Puget Sound Naval Shipyard
Bremerton, WA
Project ENVVEST Study Area

November 17, 2010



Puget Sound Naval Shipyard and Surrounding Area

PNNL Contract No.: N4523A10MP00034 Amendment 1



1.0 Introduction

Taylor/TEC conducted non-dry dock stormwater sampling tasks within the Puget Sound Naval Shipyard (PSNS) – Project ENVVEST study area between November 16th and 18th, 2010. This was the initial storm event (STE) of the 2010-2011 project sampling season. A summary of the events and conditions that occurred during STE#1 are presented in this report, with supporting information as attachments.

This STE Report contains: 1) a list of the Taylor/TEC and Navy staff that participated in the event and their base roles; 2) details regarding storm event preparatory tasks; 3) weather forecast information and targeting details; 4) a precipitation and event qualification summary; 5) a sampling information, management and validation discussion; 6) basin runoff calculations; 7) descriptive statistics and discussion of the event station monitoring data; 8) notable anomalies and variations to the PWP; and 9) action items.

Attachments containing weather forecast information, field sampling / sample processing forms, COC forms, station hydrographs and autosampler reports are also included in this report.

2.0 Project Staff Participating in the STE

Taylor/TEC Personnel:

Dave Metallo – Project Manager, Storm Controller, Field Event and QC Manager

Brian Rupert – Field Team Leader

Joe Berg – Field Team Member

Navy Personnel:

Bob Johnston – Technical Oversight

Jacquelyn Young – NPDES Manager, Grab Sample Collection Lead, Navy Event QC Manager

Eric Mollerstuen – Field Team Member

Teal Tomkins – Field Team Member

3.0 Storm Event Preparatory Tasks

By late October, 2010 all four of the monitoring stations (PSNS 81.1, PSNS82.5, PSNS096 and PSNS126) had been installed and were fully operational. Figure 1 shows the general location of the monitoring stations at the PSNS. During STE#1 all four stations were positioned within the CIA. A few minor troubleshooting issues remained (e.g. hyperlink communication function at PSNS82.5 and PSNS096), but nothing that would prevent event targeting and sample collection.

On October 28th field equipment blanks were collected at each of the four monitoring stations. Sampling lines had been thoroughly back flushed with DI water and were ready for sample collection.

One item of note was that the level data from PSNS096 was examined and it was determined that the transducer sensor was in need of attention beyond typical calibration methods. On November 9th the INW CT2X transducer at PSNS096 was removed and replaced with a loaner unit of the same make and model; with some slight modification to its mounting near the vaults invert. The level drift and fluctuation problem was ultimately determined to be caused by siltation impacts. The installation modifications applied to the loaner transducer allowed for the continued collection of accurate level data.

On November 16th a Taylor/TEC crew readied the four monitoring stations for an impending storm event forecasted for the 17th. Items contained in Sections 1 and 2 of the *Stormwater Field Sampling Forms* (Attached) were completed at all four monitoring station with no issues reported. All stations were set (in disabled mode) with pre-determined autosampler enable and pacing condition settings as directed by the Taylor/TEC Storm Controller.

4.0 Weather Forecast Information and STE Targeting Details

The two week period of November prior to STE#1 had been rainy (3.17" as measured by the PSNS gauge at B427) with several 0.5 to 1.25" events interspersed with smaller events and showers. By the 15th the forecast for the Bremerton area was promising. The routinely referenced weather models used to gain forecast information in the Pacific Northwest, the MM5-NAM (<http://www.atmos.washington.edu/mm5rt/rt/naminit.12km.html>) and the GFS-WRF (<http://www.atmos.washington.edu/mm5rt/rt/gfsinit.frame1.html>) (both hosted by the University of WA and initialized for the PNW) were in fairly good agreement with each other for this storm event. Both predicted the arrival of the storm event to be between 0400 and 0700 on November 17th, with moderate to heavy rain lasting until early afternoon. Both models predicted that showery conditions would linger throughout the day – with the GFS-WFR further predicting another heavy slug of rain to occur after 2100, lasting for several hours.

The forecasted precipitation probability was between 80-100% for a 0.5" - 0.6" depth or greater event. A vigorous frontal system was setting up over the region and would likely spread rain throughout the lowlands of the entire forecast area and develop into a snow event for elevations in excess of 3000' starting late Tuesday night in Wednesday morning. The weather was forecasted to remain unsettled with periods of rain through Friday. Detailed weather information is provided in the Attachment section of this report.

Once the field crew reported the completion of their site preparatory tasks on the 16th the Taylor/TEC Storm Controller took command of station operation via telemetry. With a check to ensure a qualifying antecedent dry period had been met, the enable condition switches were turned on (sample ready mode). Table 1 lists the monitoring station enabling conditions that were used for STE#1.

As predicted, rain began to fall over the shipyard at approximately 0300 on November 17th. A check of PSNS126 at approximately 0845 on the morning of the 17th revealed that there had been enough rainfall to cause runoff (0.11" by 0845 check) but the vault level, although elevated above

base flow, had not risen to the pre-set enable condition of 0.25'. Both PSNS81.1 and 82.5 had begun sampling at 0829 and 0755, respectively. At approximately 0850 the level enable at PSNS126 was re-adjusted to 0.2'; the autosampler enabled at 0905. A check of the station levels and hydrographs showed that all were elevated above base flow. However, due to tidal conditions (elevated conductivity), PSNS096 had not enabled by 1300, but remained armed and ready. A final station check, via telemetry, revealed that PSNS096 enabled at 0047 on 11/18. Storm Controller notes, which provide additional details, are included in the Attachment section of this report.

Table 1. Monitoring Station Enabling Conditions

Station	Rainfall (in/hr)	Level (ft)	Conductivity (µS/cm)	Repeatable Enable (Y/N)	Pacing (min)	¹ Antecedent Period (24hr/6hr)
PSNS81.1	0.03	0.25	2000	N	15	0" / 0"
PSNS82.5	0.03	0.17	2000	N	15	0" / 0"
PSNS096	0.03	0.25	2000	N	15	0.01" / 0"
PSNS126	0.03	0.20	2000	N	15	0.01" / 0"

¹Antecedent condition as checked b/w 0030 and 0035 on 11/17/10

5.0 Precipitation and STE Qualification Summary

Precipitation Summary:

The last rain event to cause runoff (≥ 0.03 " rainfall without 6-hr gap) prior to the onset of STE#1 range from 1:21:05(Days:Hours:Minutes) at PSNS82.5 to 3:0:35 at PSNS81.1, as measured by each stations rain gauge. Moderate to heavy rain fell over the shipyard from approximately 0330 until approximately 1505 when the rain tapered off. About one-half of the rain totals were generated between this time period. Another heavy slug of rain started around 2330 on the 17th and lasted until about 0115 on the 18th, with showers lingering until about 1100, adding another approximately 0.25" of rainfall to the station totals. The storm event duration ranged from about 29 hours at PSNS81.1 to about 31 hours at PSNS126. Table 2 summarizes rainfall for the two segments of the storm event as well as total rainfall for the storm event. Table 2 also summarizes the total rainfall that occurred during the sampling period for each monitoring station as well as the PSNS rain gauge at B427. The attached Field Sampling forms provide details regarding the specific sampling periods for each monitoring station. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), provides additional storm event and sampling period rainfall information (attached to this report).

Table 2. Rainfall Totals for PSNS Gauge and Monitoring Stations

Station	Storm Event Rainfall b/w 0330 – 1505 11/17 (in)	Storm Event Rainfall b/w 1505 11/17 and 1100 11/18 (in)	Sampling Period Rainfall (in)	Sampling Period	Total Storm Event Rainfall (in)
B427	0.29	0.28	NA	NA	0.57
PSNS81.1	0.22	0.24	0.38	11/17 (0829) – 11/18 (0812)	0.46
PSNS82.5	0.24	0.27	0.51	11/17 (0755) – 11/18 (0739)	0.59
PSNS096	0.32	0.29	0.21	11/18 (0047) – 11/18 (1030)	0.61
PSNS126	0.22	0.29	0.39	11/17 (0905) – 11/18 (0849)	0.51

STE Qualification Summary:

All storm qualification conditions were met for this event. These storm event qualification conditions included wet season event date range (Oct 1 – May 1), forecast probability ($\geq 70\%$), antecedent dry period (≤ 0.1 " rain in previous 24hrs and 0" rain in previous 6hrs), forecasted storm depth (≥ 0.1 "), storm duration (≥ 2 hrs) and runoff occurrence / hydrograph stage (elevated above base flow). Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), documents the particular STE qualification listed above.

6.0 Sampling Information, Management and Validation**Grab Sampling:**

All grab sample collection was conducted by the Navy Team, with storm control assistance (limited to station status checks via telemetry) from Taylor/TEC where necessary. Sampling was conducted at all four of the current monitoring stations. Grab samples were collected as per the 201-11 Project Work Plan (PWP). Water quality condition (conductivity) was assessed prior to the collection of the samples; water was sampled only if it was determined to be ≤ 2000 $\mu\text{S}/\text{cm}$. Samples were collected using manual methods; a laboratory cleaned stainless steel dip cup lowered on a pole used to fill the appropriate analytical containers. Parameters included total petroleum hydrocarbons (NW-TPH-Dx) and fecal coliform. All samples were collected on the November 17th between 2030 (PSNS81.1) and 2140 (PSNS126). Sample collection was coordinated with low or lower tidal conditions to ensure that proper conductivity conditions would exist. Grab sampling times are indicated on the attached hydrographs to illustrate the water level stage during collection. Grab sample IDs, along with the other pertinent information is list in the *Stormwater Field Sampling Forms* and in Table A-1 (both are attached). Table 3 summarizes these results.

Table 3. Grab Sampling Details

Sample Collection Criteria:	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Grab sample ID	SW010004	SW010001	SW010003	SW010002
Grab Date /Time	11/17/2010 21:40	11/17/2010 20:30	11/17/2010 21:14	11/17/2010 20:53
Grab sample conductivity value (μS/cm)	184	835	76.7	195
Hydrograph stage at grab collection	Intra-event runoff	Elevated Flow	Intra-event runoff	Intra-event runoff
Grab parameters collected per PSNS PWP?	Yes	Yes	Yes	Yes

Composite Sampling:

Composite sample retrieval tasks and formulation procedures were managed by Taylor/TEC with support from Navy personnel as requested. Composite samples were collected from all four of the current monitoring stations.

Composite samples were collected via autosampler regulated and synchronized by a custom designed telemetered water quality control system. Methods used in preparation, retrieval and formulation of the composite samples were conducted as per the PWP. Discrete time-paced samples were collected in 1000-ml plastic wedge bottles (up to 24 bottles) at an aliquot rate of 240-ml / 15 minutes (four samples / bottle, one bottle / hour); which, at this rate, provides for 24 hours of sampling coverage. Samplers at each station were enabled as per the conditions stated in Section 4 of this report. Each station was outfitted with either a pressure transducer (level and temperature) / conductivity (with salinity post-calculated) probe combo (INW CT2X) (PSNS081.1, PSNS096 and PSNS126) or a pressure transducer (level and temperature) (Campbell CS450) and a multi-parameter sonde (conductivity, salinity and temperature) (YSI6820).

The discrete samples from each station were brought back the C106 Stormwater Lab at B147 for processing. Each individual discrete sample was screened with bench-top meters for its conductivity value. Bottles with values ≤ 2000 μS/cm were included in the overall composite sample; bottles testing greater than 2000 μS/cm were discarded. Based on this screening criterion, none of the discrete samples from PSNS096 qualified. All samples from this station were discarded; therefore no composite was submitted from this station for STE#1. Composite formulation followed the procedures as detailed in Section 8.2.5 of the PWP. Composite samples parameters included: hardness, TOC, DOC, TSS, total and dissolved metals and turbidity. A small portion from each of the composite samples was poured off for the assessment of overall conductivity value. Results of the composite formulation, bench top testing results, as well as sample IDs, sample date/time and resultant overall conductivity values, are detailed in the *Stormwater Field Sampling Forms* and in Table A-1 (both are attached). Table 4 summarizes these results.

Table 4. Composite sampling Details

Sample Collection Criteria:	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Composite sample ID	SW01-0007	N/A	SW01-0006	SW01-0005
Composite Date /Time	11/18/2010 8:49	N/A	11/18/2010 5:24	11/18/2010 5:12
Overall Composite conductivity value (μ S/cm)	243	N/A	72	140
Composite volume (ml)	9000	N/A	7500	8000
Composite parameters collected per PSNS PWP?	Yes	No	Yes	Yes

All sampling and vault monitoring equipment operated as designed and programmed. Details pertaining to autosampler programming and event-specific operation of each monitoring station sampler unit are contained in the attached *Sampler Reports*.

QC Samples:

No quality control samples were collected during STE#1. As previously mentioned in Section 3 of this report, field equipment blank samples were collected at each monitoring station prior to STE#1.

Sample Management:

All samples were handled and managed as per Section 9 of the PWP and in a manner acceptable and within industry standards regarding practices typical for tasks of this nature. Once collected, both grab and composite samples were placed into coolers and put on ice and/or into the Stormwater Laboratory refrigerator to maintain temperatures between 2 and 6 °C.

All sample IDs, collection date and time, matrix, requested parameter analysis and other associated information were documented on *Chain-of-Custody (CoC) forms* (attached). Samples were in direct control of project and/or laboratory personnel at all times. Samples were delivered to the testing facility, Battelle Marine Science Laboratory in Sequim, WA, in good, useable and properly chilled condition. Enough sample was collected from the targeted stations to proceed with the scheduled analysis of all parameters per the 2010-11 PSNS NDDSW PWP.

Sample Validation Summary:

All sample validation criteria were met for this event per Section 8.2.6 of the PWP. Prior to processing the samples and transferring custody to the analytical laboratory, the Taylor/TEC Field Event Lead validated the samples against certain criteria. These validation criteria included runoff occurrence / hydrograph stage, anomalous conditions check, sample preparation and handling review, parameters collected, sampling duration or 75% storm hydrograph coverage, minimum number of aliquots, sample volume, discrete and composite samples conductivity measurement results, quality control sample collection and anomalous conditions assessment. Table A-1 (*Storm*

Qualification and Sample Validation Information Checklist), documents the particular STE qualification listed above.

7.0 Basin Runoff Calculations

As described in Section 7.4 of the PWP, rainfall runoff volumes were calculated for each of the basins associated with the current monitoring stations. These calculations are based on the Runoff Coefficient Method. Table 5, below, summarizes the results from these calculations.

Table 5. Monitoring Station Runoff Volume Calculations

Station	Combined Drainage Area (Ft ²)	STE Rain Total (In)	STE Rain Total (Ft)	STE Runoff Vol. (Gal)	Sample Event Rain Total (In)	Sample Event Rain Total (Ft)	Sample Event Runoff Vol. (Gal)	% of Runoff Sampled During STE
PSNS126	591,881	0.51	0.0425	188,172	0.39	0.0325	143,896	76
PSNS096	635,317	0.61	0.0508	241,585	0.21	0.0175	83,169	34
PSNS082.5	82,764	0.59	0.0492	30,440	0.51	0.0425	26,313	86
PSNS081.1	849,074	0.46	0.0383	243,475	0.38	0.0317	201,131	83

8.0 Descriptive Statistics and Discussion of the Event Station Monitoring Data

Descriptive statistics for the sampling period at each monitoring station are provided in Table 6, below. These statistics include minimum, maximum, average and median for 5-minute interval rainfall data, vault level, conductivity, salinity, transducer water temperature, YSI water temperature (PSNS82.5 only) and tide stage. Sampling period rainfall totals, as well as maximum 1-hour intensity and average 1-hour intensity (includes intra-event dry periods) are included as part of each station's rainfall information.

Table 6. Sampling Period Rainfall and Vault Parameter Descriptive Statistics

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (uS/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
PSNS81.1 min	0			-0.21	21.69	2	6.63		1.50
max	0.03			8.49	45205.00	40.62	21.13		11.10
average	0.001			4.14	2677.20	39.10	12.68		7.08
median	0			4.66	131.41	2	11.97		7.60
total	0.38	0.17	0.016						
PSNS82.5 min	0			0.01	27.00	.02	5.91	5.99	1.50
max	0.04			3.23	115.00	.08	11.24	11.30	11.10

Table 6. Sampling Period Rainfall and Vault Parameter Descriptive Statistics

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (uS/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
average	0.002			0.77	64.35	.44	8.76	8.91	7.06
median	0.000			0.33	69.80	.05	9.53	9.64	7.60
total	0.51	0.15	0.021						
PSNS096 min	0			4.15	-2.90	2	7.36		5.90
max	0.04			7.92	47797.00	42	11.40		10.00
average	0.002			6.05	37411.97	38.59	10.80		7.91
median	0.000			6.10	47620.00	42	10.96		7.80
total	0.21	0.15	0.022						
PSNS126 min	0			0.09	33.93	2	5.58		1.50
max	0.04			4.07	1274.90	2	12.05		11.10
average	0.001			1.12	254.53	2	10.63		7.09
median	0.000			0.30	179.49	2	11.07		7.60
total	0.39	0.14	0.017						

¹salinity calculation for PSNS81.1, 096 and 126 is based on an algorithm that has a lower range cut-off of 2ppt. Actual field values may be lower. PSNS096 used a different conductivity probe (YSI6820) that utilized a different internet salinity calculation function and thus is able to calculate lower low range salinity values.

All four of the station hydrographs (see attached) showed a double peak response to the corresponding double rainfall surge that occurred during the storm event. The rainfall also happened to be nearly coincident with the diurnal tide cycle for November 17th and 18th. This fact in particular was the likely cause for PSNS096 not being able to produce qualifying freshwater samples (although there was runoff, the rainfall in the 096 basin, coupled with its extreme low elevation, was not intense enough to overcome the rising tide and subsequent backwater effects). All of the stations (except PSNS096) show a sharp drop in conductivity / salinity during the rainfall periods of the storm event. Warmer rain water temperatures (as compared to the seawater temperatures) are evident in the vaults as well (except at PSNS096) during the rainfall periods. All of the grab samples were collected the interlude between rainfall surge periods. Hydrograph stage was either on the falling limb or near base flow levels. However, all samples collected during these periods were, based on examination of the vault data, freshwater runoff from the rainfall event. Sample marker and grab sampling indications have been applied to the hydrographs.

Telemetry System Metadata:

All of the monitoring stations were operating without incident by the start of STE#1. None of the stations, except PSNS096, had an notable issues. An excerpt from the PSNS096 metadata file (separate submission) is provided below:

20 Sep - 6 Oct (1215) - this was the period of site installation, sensors were logging during entire period but not completely installed and calibrated until 6 Oct, which effected all parameters. Level sensor was calibrated later in the day of 6 Oct and was subsequently "offline" a few hours longer than the rest of the sensors. Due to vault conditions and a strong tidal flush at this station, the level sensor was impacted by shifting sediments - which in turn adversely effected representative data generation by the level sensor. A severe drift in level was noted during the period between 20 Oct - 8 Nov. Several events to re-calibrate and clean the sensor were conducted. On 27 Oct an updated program was uploaded to the datalogger in an attempt to rule any improper collection routines (no avail). The manufacturer (INW) was contacted and the decision was made to pull the Navy's sensor and temporarily replace it with a loaner unit (of the same model). The Navy's unit was brought back to INW for a complete diagnostic check and shop cleaning. On 9 Nov the replacement transducer was installed at the site in a slightly different configuration (raised 2-3 inches off of the bottom of the vault floor). This seemed to be an effective fix, as there were no further level data collection issues. Subsequently, the Navy's unit was cleaned, passed all diagnostic testing and was re-calibrated and certified for use. The loaner unit remained in service until 13 Jan, 2011. Salinity data experience various bouts of drop-out during the dates indicated above. The causes for this were either negative conductivity values used for salinity calculation, maintenance periods or for a few instances were unexplainable. However, during all of these salinity problem periods conductivity functioned.

9.0 Notable Anomalies and Variations to the PWP

There were no anomalies observed that would have otherwise caused any of the STE#1 samples to be non-representative of the conditions from which they were collected. As reported above no composite sample was submitted for PSNS096 due to conductivity issues. This issue was managed as appropriate per the PWP.

10.0 Action Items

Routine action items include resetting (reloading with bottles, charging batteries, back flushing with DI water, etc.) all four monitoring stations and re-stocking of sampling supplies Routine station maintenance items (e.g. sensor cleaning and calibration, rain gauge maintenance, etc.) as well as storm set-up tasks may also need to be completed as necessary. Non-routine action items include the re-installation of the Navy's transducer at PSNS096. The current focus of the field efforts will be in maintaining proper station and equipment operation, data and resource management and storm-tracking tasks.



Figure 1. Stormwater Monitoring Locations within the Shipyard Boundary

ATTACHMENTS

- Storm Qualification and Sample Validation Information Checklist
- Stormwater Field Sampling Forms and Controller Notes
- Chain-of-Custody Forms
- Runoff Calculation Worksheet
- Station Hydrographs
- Autosampler Reports
- Weather Forecast Information

Table A-1. PSNS Non-Dry Dock Stormwater Monitoring Tasks
Storm Qualification and Sample Validation Information Checklist
Stormwater Sampling Event #1 (11/17/10)



This form acknowledges representativeness criteria described in the project PWP.
Mark with "Yes" to acknowledge acceptable, "No" for not acceptable, "NA" or "-" if not applicable.

1 Storm Event Data:				
Project Storm Event (STE) #	1			
Event Forecast Probability (%)	80-100%			
PSNS C106 Rain Gauge - Storm Event Total (in.)	0.57			
Rainfall and Runoff Summary:				
Last Runoff ($\geq 0.03"$ rainfall without 6-hr gap) Prior to STE Start (days:hrs:min)	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Antecedent Dry Period (days:hrs:mins)	2:23:55	1:21:20	1:21:05	3:0:35
Rainfall Prior 24-hrs to Sampling Start	0:17:55	0:16:50	1:15:50	1:18:05
Rainfall Prior 6-hrs to Sampling Start	0.01	0.01	0.00	0.00
STE Start Date & Time	0.00	0.00	0.00	0.00
STE Duration (days:hrs:mins)	11/17/10 3:30	11/17/10 3:45	11/17/10 3:30	11/17/10 4:10
STE End Date & Time	1:06:50	1:06:20	1:05:30	1:04:40
Period Between Next Measureable Rain (days:hrs:mins)	11/18/10 10:20	11/18/10 10:05	11/18/10 9:00	11/18/10 8:50
Storm Event Total Rainfall (in)	1:04:25	0:17:45	0:13:00	0:05:25 (0.01")
Storm Event Max 1-hr Rainfall Intensity (in/hr)	0.51	0.61	0.59	0.46
Storm Event Average 1-hr Rainfall Intensity (in/hr)	0.14	0.15	0.15	0.17
Sampling Period Total Rainfall (in)	0.017	0.020	0.020	0.016
Sampling Period Max 1-hr Rainfall Intensity (in/hr)	0.39	0.21	0.51	0.38
Sampling Period Average 1-hr Rainfall Intensity (in/hr)	0.14	0.15	0.15	0.17
Runoff volume calculated for entire storm period (gallons)	0.017	0.022	0.021	0.016
Runoff volume calculated for sampling period (gallons)	188,172	241,585	30,440	243,474
Percentage of total storm runoff utilized during sampling period	143,896	83,169	26,313	201,131
	76%	34%	86%	83%
1 Sample Collection Criteria:				
Grab sample ID	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Grab Date /Time	SW010004	SW010001	SW010003	SW010002
Grab sample conductivity value ($\mu\text{S}/\text{cm}$)	11/17/2010 21:40	11/17/2010 20:30	11/17/2010 21:14	11/17/2010 20:53
Hydrograph stage at grab collection	184	835	76.7	195
Grab parameters collected per PSNS PWP ?	Intra-event runoff	Elevated Flow	Intra-event runoff	Intra-event runoff
Composite sample ID	Yes	Yes	Yes	Yes
Composite Date /Time	SW01-0007	N/A	SW01-0006	SW01-0005
Overall Composite conductivity value ($\mu\text{S}/\text{cm}$)	11/18/2010 8:49	N/A	11/18/2010 5:24	11/18/2010 5:12
Composite volume (ml)	243	N/A	72	140
Composite parameters collected per PSNS PWP ?	9000	N/A	7500	8000
	Yes	No	Yes	Yes
1 QC Sample Summary Information:				
Grab sample duplicate ID	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Grab sample duplicate date and time	N/A	N/A	N/A	N/A
Grab sample duplicate conductivity value ($\mu\text{S}/\text{cm}$)	N/A	N/A	N/A	N/A
Composite sample duplicate ID	N/A	N/A	N/A	N/A
Composite sample duplicate date and time	N/A	N/A	N/A	N/A
Was additional volume collected for MS/MSD analysis (grab, comp or both) ?	N/A	N/A	N/A	N/A
Overall Composite Duplicate conductivity value ($\mu\text{S}/\text{cm}$)	N/A	N/A	N/A	N/A
Composite Duplicate volume (ml)	N/A	N/A	N/A	N/A
1 Storm and Sample Validation:				
Was the targeted STE antecedent qualified per PSNS PWP? (if no, then see next line)	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Was the antecedent overage amount greater than 10% of the total rain event ?	Yes	Yes	Yes	Yes
Was runoff occurring OR was the hydrograph at least 10% above background pipe level during grab collection ? If no, explain in summary narrative.	N/A	N/A	N/A	N/A
Were a minimum of 8 aliquots collected OR does the composite sample represent at least 75% of the stations storm event rain volume ?	Yes	Yes	Yes	Yes
Were all 1-hr sampler bottles used for the Composite sample $\leq 2000 \mu\text{S}/\text{cm}$?	Yes	Yes	Yes	Yes
Did any anomalous conditions exist that could make samples non-representative? Explain if "Yes"	Yes	No	No	No
Based on consideration of the information above, was the sample collected during the STE valid for project purposes ? (Y / N, composite, grab or both)	No	Yes for Grab; No for Comp	Yes	Yes

1 If the answer to any of these questions is "No" OR indicate non-representative conditions, then these items should be explained in the Event Narrative.

Validation Check List Completed By / Date: Dan O'Brien

Reviewed By / Date: [Signature] 12/15/10



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 081-1	MH/CB#: —	Loc. Descrip. —	Page: 1 of 2
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pages per station

Section 1. Station Reset and Inspection			
Personnel: JB, BR		Weather: OVERCAST	
		Arrival Date/Time: 11/16/10 @ 1320	
Carry-over maintenance to do prior to set-up: NO		done? N/A	
Sampler Battery Voltage	12.63	Changed? Y (N)	New voltage N/A
Modem Battery Voltage	13.20	Changed? Y (N)	New voltage N/A
Sample Tubing & Strainer OK?	YES	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	NO: adjustable for MS
Trands. Cable OK?	YES	Internal Sampler Tubing OK?	YES
Trands. Desiccant OK (Yes/No)	YES	Tubing Replaced? (Yes/No)	NO
Telem. Box Desiccant OK (Yes/No)	YES	Normal Smler Program or Dup. ?	Normal
Modem Status	ON	Bottles Loaded ?	YES
Notes (including channel condition):		Lid Status?	OFF
		Backflushed with DI?	YES
		Suction line & quick connect attached?	YES
		Last Status (on/off) last screen...	"Disabled"

Section 2. Storm Setup and Inspection			
Personnel: JB, BR		Weather: OVERCAST	
		Arrival Date/Time: 11/16/10 @ 1320	
Sampler Battery Voltage	12.63	Changed? Y (N)	New voltage N/A
Modem Battery Voltage	13.20	Changed? Y (N)	New voltage N/A
Sample Tubing & Strainer OK?	YES	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	YES
Transducer Cable OK?	YES	Aliquot Vol. Cal.'ed (Y/N & vol.)	YES
Multi-meter Cable OK	YES	Program Reviewed (Yes/No), Dup ?	YES
Recorded Level (FT)	7.24	Lids off bottles?	YES
Measured Level (FT)	6.68	Diagnostics/Distributor arm check?	YES
Offset Diff (FT)	0.68	Backflush with DI?	YES
Level Adjusted ?	YES	Last screen...	"DISABLED"
Cond. Sonde Type (YSI6820 or INW-CT2X)	INW-CT2X	Ice Deployed?	NO
Cond. Sonde Cal. Info. : Recorded Val. = 45.739 Meas. Val. = 44.81 Diff. = 0.8 (>10% adj. offset); Offset = 9.00 New Rec Val = 44.98			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) @ cleaned and levelled the rain gauge @			

Section 3. Grab Sample Collection			
Personnel: EM, JY		Weather: Windy, clear	
		Arrival Date/Time: 11/17/10 2043	
On Composite... (Bottle # Aliq #)	BTL13 2 of 4	Composite Begin Time (date / time)	11-17-10 0829
Grab Parameters Collected	TPH, Fecal		
Grab Sample ID	SW010002	Conductivity Reading (what meter?)	195 µS YSF
Grab Date/Time	11/17/10 2053	Grab MS/MSD Collected ?	NA
Grab Dup ID	NA	Equipment running correctly?	Yes
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	OK NO V
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: OK			
Storm Controller notified (Y or N/A)?:	NA	Ice OK?	NO K.R.
Notes:			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 081.1 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)			
Personnel: <u>DM/BR/JY</u>		Weather: <u>Partly Cldy, 40's, lite wind</u> Arrival Date/Time: <u>11-18-10 1030</u>	
Sampler Battery Voltage	<u>low 12v</u>	Changed? Y <u>N</u> <u>Pulled</u>	New voltage <u>NA</u>
Telemetry Battery Voltage	<u>OK</u>	Changed? Y <u>(N)</u>	New voltage <u>NA</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>11-17-10 0829</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>11-18-10 0812 #24 4 of 4</u>		
Total Composite Sample Volume Collected	<u>24 1-L BTLs minus aliquots missed (see below)</u>		
Aliquots missed/NLD (date/time/bott #/aliq #) <u>#11 2-4; all of BTLs 12-14; #15, 1; all of BTLs 22-24</u>			
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK</u>			
Storm Controller notified (Y or N/A)? <u>NA</u>		Which parameter?: <u>NA</u>	
Notes: <u>Sampler ran fine, system looks good</u>			
Maintenance Needed: <u>Typical reset items</u>			

Section 5. Compositing Scheme and QC Sampling	
Personnel: <u>DM/BR</u>	Date/Time: <u>11-18-10</u>
Conductivity Meter Info. (Manuf., Model, Serial#, Cal. info.) <u>PSNS ENV#027 YSI 30 SN: 9800994AB</u>	
Conductivity Testing (List individual sampler bottle and reading): BTL#/cond μ S/cm result / included in comp Y/N	
<u>1 - 4036 - No</u>	<u>7 - 68 - Yes</u>
<u>2 - 258 - Yes</u>	<u>8 - 63 - Yes</u>
<u>3 - 10,090 - No</u>	<u>9 - 72 - Yes</u>
<u>4 - 42,300 - No</u>	<u>10 - 125 - Yes</u>
<u>5 - 262 - Yes</u>	<u>11 - 231 - Yes</u>
<u>6 - 84 - Yes</u>	<u>12 - 194 - Yes</u>
<u>13 - 181 - Yes</u>	<u>14 - 157 - Yes</u>
<u>15 - 169 - Yes</u>	<u>16 - 28,700 - No</u>
<u>17 - 19,000 - No</u>	<u>18 - 128 - Yes</u>
<u>19 - 150 - Yes</u>	<u>20 - 217 - Yes</u>
<u>21 - 72 - Yes</u>	<u>22 - Empty</u>
<u>23 - ↓</u>	<u>24 - ↓</u>
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Used all bottles above, except #'s 1, 3, 4, 16 & 17; Used 500-ml from each btl.</u>	
Overall Composite Info. (include conductivity measurement, volume and requested analysis) <u>Total comp. vol. = 8,000 ml, Overall Comp cond. = 140 μS/cm, analysis per FSP</u>	
Composite Sample ID & Time: <u>SW01-0002 (0512) 11-18-10</u>	
Field Blank Collected? (date/time)	<u>NO</u>
Blank ID:	<u>NA</u>
Duplicate comp sample? Yes/No	<u>NO</u>
Duplicate sample ID	<u>NA</u>

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 082-5	MH/CB#: —	Loc. Descrip. —	Page: 1 of 2
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Pages per station

Section 1. Station Reset and Inspection			
Personnel: JB, BR		Weather: CLEAR	
Arrival Date/Time: 11/16/10 @ 1145			
Carry-over maintenance to do prior to set-up: TEST LOAD TEST ENABLE		done? YES	
Sampler Battery Voltage	12.33	Changed? Y (N)	New voltage N/A
Modem Battery Voltage	13.39	Changed? Y (N)	New voltage N/A
Sample Tubing & Strainer OK?	YES	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	NO: ADJUSTED 1hr for DLS
Trans. Cable OK?	YES	Internal Sampler Tubing OK?	YES
Trans. Desiccant OK (Yes/No)	YES	Tubing Replaced? (Yes/No)	NO
Telem. Box Desiccant OK (Yes/No)	YES	Normal Smler Program or Dup. ?	NORMAL
Modem Status	ON	Bottles Loaded ?	YES
Notes (including channel condition): NEEDS DESICCANT indicator for telemetry Enclosure		Lid Status?	OFF
		Backflushed with DI?	YES
		Suction line & quick connect attached?	YES
		Last Status (on/off) last screen...	"DISABLED"

Section 2. Storm Setup and Inspection			
Personnel: JB, BR		Weather: CLEAR	
Arrival Date/Time: 11/16/10 @ 1145			
Sampler Battery Voltage	12.33	Changed? Y (N)	New voltage N/A
Modem Battery Voltage	13.39	Changed? Y (N)	New voltage N/A
Sample Tubing & Strainer OK?	YES	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	YES
Transducer Cable OK?	YES	Aliquot Vol. Cal.'ed (Y/N & vol.)	YES
Multi-meter Cable OK	YES	Program Reviewed (Yes/No), Dup ?	YES: NO DUP
Recorded Level (FT)	-0.01	Lids off bottles?	YES
Measured Level (FT)	-0.05	Diagnostics/Distributor arm check?	YES
Offset Diff (FT)	0.04	Backflush with DI?	YES
Level Adjusted ?	YES	Last screen...	
Cond. Sonde Type (YSI6820 or INW-CT2X)	YSI 6820	Ice Deployed?	NO
Cond. Sonde Cal. Info. : Recorded Val. = 98 Meas. Val. = 9127 Diff. = 29 (>10% adj. offset); Offset = N/A New Rec Val = N/A			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) After calibration the YSI was reading within 4 ms/cm @ desired and leveled out range @ Calibrated the YSI Sonde with 2060 US/cm standard then 30.10 ms/cm standard			

Section 3. Grab Sample Collection			
Personnel: EM, JY		Weather: Windy, clear	
Arrival Date/Time: 11/17/10 2104			
On Composite... (Bottle #/ Aliq #)	14 2 of 4	Composite Begin Time (date / time)	11-17-10 0755
Grab Parameters Collected	TPH, Fecal		
Grab Sample ID	SW010003	Conductivity Reading (what meter?)	76.7 μS YSI
Grab Date/Time	11/17/10 2114	Grab MS/MSD Collected ?	NA
Grab Dup ID	NA	Equipment running correctly?	YES
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	OK NO V
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which? OK			
Storm Controller notified (Y or N/A)?	NA	Ice OK?	NO ICE
Notes: Temp 9.9°C			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 082-5

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Section 4: Post-Storm Sample Collection (for grab, comp or both)

Personnel: DM/BR/JY	Weather: Partly cldy, 40's, lito wind	Arrival Date/Time: 11-18-10 (1000)
Sampler Battery Voltage	low 12v	Changed? Y N Pull
Telemetry Battery Voltage	OK	Changed? Y (N)
Additional Grabs (IDs, date/time)	NA	
Additional Dup Grab (IDs, date/time)	NA DM 17	
Composite Begin Time (date/time)	0755 11-18-10	Sampler Report Downloaded? YES
Last Aliquot Taken (date/time, bott #, aliq #)	4 of 4 BTL 24 @ 0739 11-18-10	
Total Composite Sample Volume Collected	24 1-L BTLs minus aliquots missed (see below)	
Aliquots missed/NLD (date/time/bott #/aliq #) * BTL 3 all, BTL 9 3+4, BTLs 10-16 all, BTL 17 #1, BTL 22 #4, BTLs 23+24 ALL		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? OK		
Storm Controller notified (Y or N/A)?	NA	Which parameter?: NA
Notes: Sampler ran fine - all looks good		
Maintenance Needed: Typical reset items		

Section 5: Compositing Scheme and QC Sampling

Personnel: DM/BR	Date/Time: 11-18-10
Conductivity Meter Info. (Manuf., Model, Serial#, Cal. info.) PSNS ENV# 027 YSI 30 SN 98D0994AB	
Conductivity Testing (List individual sampler bottle and reading): BTL # / Cond μ S/cm result / included in comp Y/N	
1-116-Y	7-80-Y
2-105-Y	8-75-Y
3-95-Y	9-73-Y
4-90-Y	10-Empty
5-83-Y	11
6-83-Y	12
	13 Empty
	14
	15
	16
	17-72-Y
	18-50-Y
	19-35-Y
	20-36-Y
	21-38-Y
	22-37
	23-Empty
	24-Empty
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) * BTL 3 is mostly full; listed as NML; used btl's 1-9, + 17-22 used 500-ml from each bottles	
Overall Composite Info. (include conductivity measurement, volume and requested analysis) Cond. comp = 72 μ S/cm, vol. = 7,500 ml, analysis per FSP	
Composite Sample ID & Time: SW01-0003 (0524) 11-18-10	
Field Blank Collected? (date/time)	NO
Blank ID:	NA
Duplicate comp sample? Yes/No	NO
Duplicate sample ID	NA

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 096	MH/CB#: —	Loc. Descrip. —	Page: 1 of 2
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Section 1. Station Reset and Inspection			
Personnel: BR, JB		Weather: CLEAR	
Arrival Date/Time: 11/16/10 @ 1050			
Carry-over maintenance to do prior to set-up: Test Con			done?
Sampler Battery Voltage	12.85	Changed? Y (N)	New voltage N/A
Modem Battery Voltage	14.03	Changed? Y (N)	New voltage N/A
Sample Tubing & Strainer OK?	YES	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	NO: SET Back 1hr for D.S.
Trans. Cable OK?	YES	Internal Sampler Tubing OK?	YES
Trans. Desiccant OK (Yes/No)	YES	Tubing Replaced? (Yes/No)	NO
Telem. Box Desiccant OK (Yes/No)	YES	Normal Smpler Program or Dup. ?	NORMAL
Modem Status	ON	Bottles Loaded ?	YES
Notes (including channel condition): TIDE is IN Turned off auto suction head and entered a value of = 17.0'		Lid Status?	OFF
		Backflushed with DI?	YES
		Suction line & quick connect attached?	YES
		Last Status (on/off) last screen...	'DISABLED'

Section 2. Storm Setup and Inspection			
Personnel: BR, JB		Weather: CLEAR	
Arrival Date/Time: 11/16/10 @ 1050			
Sampler Battery Voltage	12.85	Changed? Y (N)	New voltage N/A
Modem Battery Voltage	14.03	Changed? Y (N)	New voltage N/A
Sample Tubing & Strainer OK?	YES	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	YES
Transducer Cable OK?	YES	Aliquot Vol. Cal.'ed (Y/N & vol.)	YES
Multi-meter Cable OK	YES N/A	Program Reviewed (Yes/No), Dup ?	YES
Recorded Level (FT)	6.85	Lids off bottles?	YES
Measured Level (FT)	6.81	Diagnostics/Distributor arm check?	YES
Offset Diff (FT)	6.04	Backflush with DI?	YES
Level Adjusted ?	YES	Last screen...	DISABLED
Cond. Sonde Type (YSI6820 or INW-CT2X)	INW-CT2X	Ice Deployed?	NO
Cond. Sonde Cal. Info. : Recorded Val. = 44.888 Meas. Val. = 47.736 Diff. = 2.848 (>10% adj. offset); Offset = -2800 New Rec Val = 44.840			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc) cleaned and calibrated rain gauge			

Section 3. Grab Sample Collection			
Personnel: EM, JY		Weather: Windy, Clear	
Arrival Date/Time: 11/17/10 2013			
On Composite... (Bottle # Aliq #)	Not started	Composite Begin Time (date / time)	Not started yet
Grab Parameters Collected	TPH, Fecal		
Grab Sample ID	SW010001	Conductivity Reading (what meter?)	835 μS YSI meter
Grab Date/Time	11/17/10 2030	Grab MS/MSD Collected ?	NA
Grab Dup ID	NA	Equipment running correctly?	OK
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	OK NO ∇
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: OK			
Storm Contoller notified (Y or N/A)?:	NA	Ice OK?	NO \llcorner
Notes: Temp - 12.9 $^{\circ}$C			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 096 continued from previous pagePage 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM/BR/JY</u>	Weather: <u>Partly Cloudy, 40s, lite. wind</u>	Arrival Date/Time: <u>11-18-10 1100</u>	
Sampler Battery Voltage	<u>low 12v</u>	Changed? Y N <u>Pulled</u>	New voltage <u>NA</u>
Telemetry Battery Voltage	<u>OK</u>	Changed? Y (N)	New voltage <u>NA</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>11-18-10 (0047)</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>10 4 of 4 11-18 (1030)</u>		
Total Composite Sample Volume Collected	<u>10 1-L BTLs</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>None missed</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK</u>			
Storm Contoller notified (Y or N/A)? <u>NA</u>	Which parameter?:	<u>NA</u>	
Notes: <u>Due to tide/rain enabling conditions, sampler started 11-18 (0047) which is 9h/47m after last rain;</u>			
Maintenance Needed: <u>Typical reset items</u>			

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>DM/BR</u>	Date/Time: <u>11-18 (1235)</u>												
Conductivity Meter Info. (Manuf., Model, Serial#, Cal. info.) <u>PSNS ENV 43T021 YSI 30 SN: 98D0994A13</u>													
Conductivity Testing (List individual sampler bottle and reading): <table><tr><td>1 - 42 - <u>41,750</u> - <u>N</u></td><td>7 - <u>42,000</u> - <u>NO</u></td></tr><tr><td>2 - 43 - <u>43,800</u> - <u>N</u></td><td>8 - <u>43,000</u> - <u>NO</u></td></tr><tr><td>3 - 44 - <u>44,100</u> - <u>N</u></td><td>9 - <u>42,600</u> - <u>NO</u></td></tr><tr><td>4 - 43 - <u>42,550</u> - <u>N</u></td><td>10 - <u>42,700</u> - <u>NO</u></td></tr><tr><td>5 - 43 - <u>42,500</u> - <u>N</u></td><td></td></tr><tr><td>6 - <u>42,500</u> - <u>N</u></td><td></td></tr></table>		1 - 42 - <u>41,750</u> - <u>N</u>	7 - <u>42,000</u> - <u>NO</u>	2 - 43 - <u>43,800</u> - <u>N</u>	8 - <u>43,000</u> - <u>NO</u>	3 - 44 - <u>44,100</u> - <u>N</u>	9 - <u>42,600</u> - <u>NO</u>	4 - 43 - <u>42,550</u> - <u>N</u>	10 - <u>42,700</u> - <u>NO</u>	5 - 43 - <u>42,500</u> - <u>N</u>		6 - <u>42,500</u> - <u>N</u>	
1 - 42 - <u>41,750</u> - <u>N</u>	7 - <u>42,000</u> - <u>NO</u>												
2 - 43 - <u>43,800</u> - <u>N</u>	8 - <u>43,000</u> - <u>NO</u>												
3 - 44 - <u>44,100</u> - <u>N</u>	9 - <u>42,600</u> - <u>NO</u>												
4 - 43 - <u>42,550</u> - <u>N</u>	10 - <u>42,700</u> - <u>NO</u>												
5 - 43 - <u>42,500</u> - <u>N</u>													
6 - <u>42,500</u> - <u>N</u>													
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>ALL (10) bottles tested too high (>2000 us/cm) to qualify for comp. submission</u>													
Overall Composite Info. (include conductivity measurement, volume and requested analysis) <u>No Comp submitted</u>													
Composite Sample ID & Time: <u>NA</u>													
Field Blank Collected? (date/time)	<u>NO</u>												
Blank ID:	<u>NA</u>												
Duplicate comp sample? Yes/No	<u>NA</u>												
Duplicate sample ID	<u>NA</u>												

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 126	MH/CB#: MH 5110	Loc. Descrip. SW side B460	Page: 1 of 2
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pages per station

Section 1. Station Reset and Inspection			
Personnel: BR, JB		Weather: CLEAR	
Arrival Date/Time: 11/16/10 @ 0920			
Carry-over maintenance to do prior to set-up:			done?
Sampler Battery Voltage	12.64	Changed? Y (N)	New voltage N/A
Modem Battery Voltage	11.90	Changed? Y (N)	New voltage N/A
Sample Tubing & Strainer OK?	YES	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	NO: ADJUSTED FOR DLS
Trands. Cable OK?	YES	Internal Sampler Tubing OK?	YES
Trands. Desiccant OK (Yes/No)	YES	Tubing Replaced? (Yes/No)	NO
Telem. Box Desiccant OK (Yes/No)	YES	Normal Smplier Program or Dup. ?	NORMAL
Modem Status	ON	Bottles Loaded ?	YES
Notes (including channel condition): OK!		Lid Status?	OFF
		Backflushed with DI?	YES
		Suction line & quick connect attached?	YES
		Last Status (on/off) last screen...	ON

Section 2. Storm Setup and Inspection			
Personnel: RR, JB		Weather: CLEAR	
Arrival Date/Time: 11/16/10 @ 0920			
Sampler Battery Voltage	12.64	Changed? Y (N)	New voltage N/A
Modem Battery Voltage	11.90	Changed? Y (N)	New voltage N/A
Sample Tubing & Strainer OK?	YES	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	YES
Transducer Cable OK?	YES	Allquot Vol. Cal.'ed (Y/N & vol.)	YES
Multi-meter Cable OK	YES N/A	Program Reviewed (Yes/No), Dup ?	YES
Recorded Level (FT)	0.02469 0.184	Lids off bottles?	YES
Measured Level (FT)	N/A 0.030, 0.175	Diagnostics/Distributor arm check?	YES
Offset Diff (FT)	N/A 0.005 0.041	Backflush with DI?	YES
Level Adjusted ?	NO NO YES	Last screen...	"Disabled"
Cond. Sonde Type (YSI6820 or INW-CT2X)	N/A	Ice Deployed?	NO
Cond. Sonde Cal. Info. : Recorded Val. = 153.13 Meas. Val. = 169.9 Diff. = 16.77 (>10% adj. offset); Offset = 17.0 New Rec Val = 170.298			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc) cleaned and level rain gauge			
adjusted sampler time back one hour. Turned off "auto-suction head" entered 13.0' for suction head.			

Section 3. Grab Sample Collection			
Personnel: EM, JV		Weather: Windy, clear	
Arrival Date/Time: 11/17/10 2:37			
On Composite... (Bottle #/ Aliq #)	13 3 of 4	Composite Begin Time (date / time)	0905 11-17-10
Grab Parameters Collected	TPH & Recal		
Grab Sample ID	SW010004	Conductivity Reading (what meter?)	184 uS YSI
Grab Date/Time	11/17/10 2:140	Grab MS/MSD Collected ?	NO
Grab Dup ID	NA	Equipment running correctly?	Yes
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	OK NO V
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: OK			
Storm Controller notified (Y or N/A)?	NA	Ice OK?	NO ice
Notes: Temp. 11.7°C			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

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Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM / BR / JY</u>	Weather: <u>partly cloudy, 40's, lite wind</u>	Arrival Date/Time: <u>11-18-10 (0930)</u>	
Sampler Battery Voltage	<u>10W/2V</u>	Changed? Y N <u>Pulled</u>	New voltage <u>NA</u>
Telemetry Battery Voltage	<u>OK</u>	Changed? Y <u>(N)</u>	New voltage <u>NA</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>11-17-10 0905</u>	Sampler Report Downloaded?	<u>Yes - RTD</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>11-18-10 0849 24 40F4</u>		
Total Composite Sample Volume Collected	<u>24 1-2 bottles</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>None missed</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>Water in vault</u>			
Storm Controller notified (Y or N/A)?	<u>NA</u>	Which parameter?	<u>NA</u>
Notes: <u>Sampler ran fine - all looks good</u>			
Maintenance Needed: <u>Typical reset items</u>			

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>DM / BR</u>	Date/Time: <u>11-18-10</u>		
Conductivity Meter Info. (Manuf., Model, Serial#, Cal. Info.) <u>PSNS YSI 30 ENV 027 SN: 98D0994 AB</u>			
Conductivity Testing (List individual sampler bottle and reading): <u>BTL# / Cond. μS/cm result / include in Comp Y/N:</u>			
<u>1-345-Y</u>	<u>7-922-Y</u>	<u>13-185-Y</u>	<u>19-493-Y</u>
<u>2-103-Y</u>	<u>8-264-Y</u>	<u>14-171-Y</u>	<u>20-493-Y</u>
<u>3-93-Y</u>	<u>9-250-Y</u>	<u>15-162-Y</u>	<u>21-488-Y</u>
<u>4-103-Y</u>	<u>10-270-Y</u>	<u>16-82-Y</u>	<u>22-143-Y</u>
<u>5-104-Y</u>	<u>11-233-Y</u>	<u>17-268-Y</u>	<u>23-131-Y</u>
<u>6-102-Y</u>	<u>12-240-Y</u>	<u>18-574-Y</u>	<u>24-91-Y</u>
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>All bottles (above) qualified for comp'ing. Used 375-ml from ea. bottle</u>			
Overall Composite Info. (include conductivity measurement, volume and requested analysis) <u>Total comp. vol. = 9000 ml Comp Cond. = 243 μS/cm; analysis per FSP</u>			
Composite Sample ID & Time: <u>SW01-0004 (0849) 11-18-10</u>			
Field Blank Collected? (date/time)	<u>No</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>No</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:

PSNS STE #1 11-17-2010

Storm Control Notes

- Field crew (Rupert/Berg) set up CIA monitoring stations today, 11-16-2010

- all stations armed & ready
- all WL levels & sp. cond. calibrated
- all Rain gauges checked & leveled
- prgms checked, enabling mechanisms tested

- Weather update (2045)

4pm updated (11-16) GFS; storm start = ~6-7 am 11-17

after 2pm Wed - patchy, slug ~2100

NAM; storm start = ~4-5 am 11-17

after 2pm Wed - patchy

- DL Wthr Frct

✓ Text

✓

meteograms

✓ 7 day

✓ Hr'ly

- Spoke w/ Bob - agreed that we should arm/set proper enable values tonight and begin sampling as soon as rain/runoff/cond. values qualify

- Antecedent

81.1 = 0.00"/24 - 0.00"/6

82.5 = 0.00"/24 - 0.00"/6

096 = 0.00"/24 - 0.00"/6

126 = 0.01"/24 - 0.00"/6

Rim
ele.

tape down

Invert
ele.

17.71

13.86

3.85

17.91

8.04

9.87

17.46

14.52

2.94

18.22

9.62

8.60

* Note: Re-calc. lvl. info @ ea. station to reflect elevation, not just water column height

Enabling ~ 00:30 (11-17)

	<u>Rain</u>	<u>Lvl</u>	<u>Cond</u>	<u>Antec. (24/6h)</u> ⁷⁰ ₅₈ ¹²
81.1	0.03"/hr	0.25'	2000 _{us/cm}	0"/0" (0030)
82.5	0.03"/hr	0.17'	2000	0"/0" (0030)
096	0.03"/hr	0.25'	2000	01"/0" (0032)
126	0.03"/hr	0.25'	2000	01"/0" (0035)

* all pacings set to 15 min

- ~ 0400 all station had ~~no~~ qualifying antecedent periods
- 81.1 + 82.5 started on their own ~ 0800 / 0830
- Dropped lvl enable cond. to 0.2', from 0.25' @ 126 to get it sampling around 0845 / 0900
- 096 not enabled as of 1300, Cond. too high
- Noticed that Sample Markers, at least around beginning of storm event, seemed "off" - Indicating more samples collected than what really was ??
- Also, sampler report (T.E.) function, NOT working @ 096 + 82.5

SAMPLE CHAIN OF CUSTODY FORM

Date: 1 of 1

Project No.:
Project: Non-dry Dock SW 2010

Battelle

Marine Sciences Laboratory
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger
Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	TPH	Turbidity					No. containers	Sample Type (grab vs. Comp)	Storm#	Notes
PSNS126 102810RB	PSNS 126	10-28-10 0120	W					X							1	G	NA	Rinse Blank
PSNS0811 102810RB	PSNS 081.1	10-28-10 0220	W					X							1	G		
PSNS096 102810RB	PSNS 096	10-28-10 0320	W					X							1	G		
PSNS0825 102810RB	PSNS 082.5	10-28-10 0445	W					X							1	G		
Dissolved																		
SW1001	PSNS126	10/28/10 1200						X							1	G	NA	is dissolved
SW1002	PSNS081.1							X							1			
SW1003	PSNS096							X							1			
SW1004	PSNS082.5							X							1			

Relinquished by: Dave Metello 10-28-10 0555
Signature Date Time
Dave Metello TAI/TEC
Printed Name Company

Received by: R/V Burlingame
Signature
R/V Burlingame
Printed Name

Total # of Containers 4
Shipment Method: hand delivery

Relinquished by: Jacquelyn Young 10-28-10 10:40
Signature Date Time
Jacquelyn Young PSNS 3IMF
Printed Name Company

Received by: Jm Brandenberger 10/28/10 1158
Signature
Jm Brandenberger 1158
Printed Name

Distribution:
1) PNNL
2) CAS
3) TAI

SW0001
SW0002
SW0003
SW0004

blanks

3174*
TME
DME
7
8
9
6 10

SAMPLE CHAIN OF CUSTODY FORM

Date: 11/17/10

Page: 1 of 1

Project No.:

Project: Non-dry Dock SW 2010

Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	TPH	Turbidity					No. containers	Sample Type (grab vs. Comp)	Storm#	Notes	
SW01-0001	PS096	11/17/10 2030	SW						X						1	Grab	SW01	low flow	
SW01-0002	PS001.1	11/17/10 2053	SW						X						1	Grab	SW01		
SW01-0003	PS02.5	11/17/10 2114	SW						X						1	Grab	SW01	Swamp collection	
SW01-0004	PS126	11/17/10 2140	SW						X						1	Grab	SW01		
SW01-0005	PSNS081.1	11-18-10 0512	SW	X	X	X	X	X		X					1	Comp	SW01		
SW01-0006	PSNS082.5	11-18-10 0524	SW	X	X	X	X	X		X					1	Comp	SW01		
SW01-0007	PSNS126	11-18-10 0849	SW	X	X	X	X	X		X					1	Comp	SW01		
SW01-0020	PSNS081.1	11/18/10 0512	SW					X								Comp	SW01	TME	
SW01-0021	PSNS081.1	11/18/10 1750	SW					X										DME	
SW01-0022	PSNS082.5	11/18/10 0524						X										TME	
SW01-0023	PSNS082.5	11/18/10 1750						X										DME	
SW01-0024	PSNS126	11/18/10 0849						X										TME	
SW01-0025	PSNS126	11/18/10 1750						X										DME	
Relinquished by: <i>[Signature]</i> 11-18-2010 1530				Received by: <i>[Signature]</i> 11/18/10 1600												Total # of Containers		Shipment Method:	
Signature: <i>[Signature]</i> Date: TAI-TEC Time:				Signature: <i>[Signature]</i>															
Printed Name: Dave Metallo Company:				Printed Name: Jill Brandenberger															
Relinquished by:				Received by:												Sample Disposition:			
Signature: Date: Time:				Signature:												Distribution:			
Printed Name: Company:				Printed Name:												1) PNLL			
																2) CAS			
																3) TAI			

3174 * 11
12
13
14
15
16
3174 14

SW - stormwater

Note: grab samples forwarded to CAS. composite samples spit and forwarded to CAS & PNLL. jmb 11/18/10

PSNS NDDSW Monitoring
Stormwater Outfall Total Discharge Volume Estimation Equations

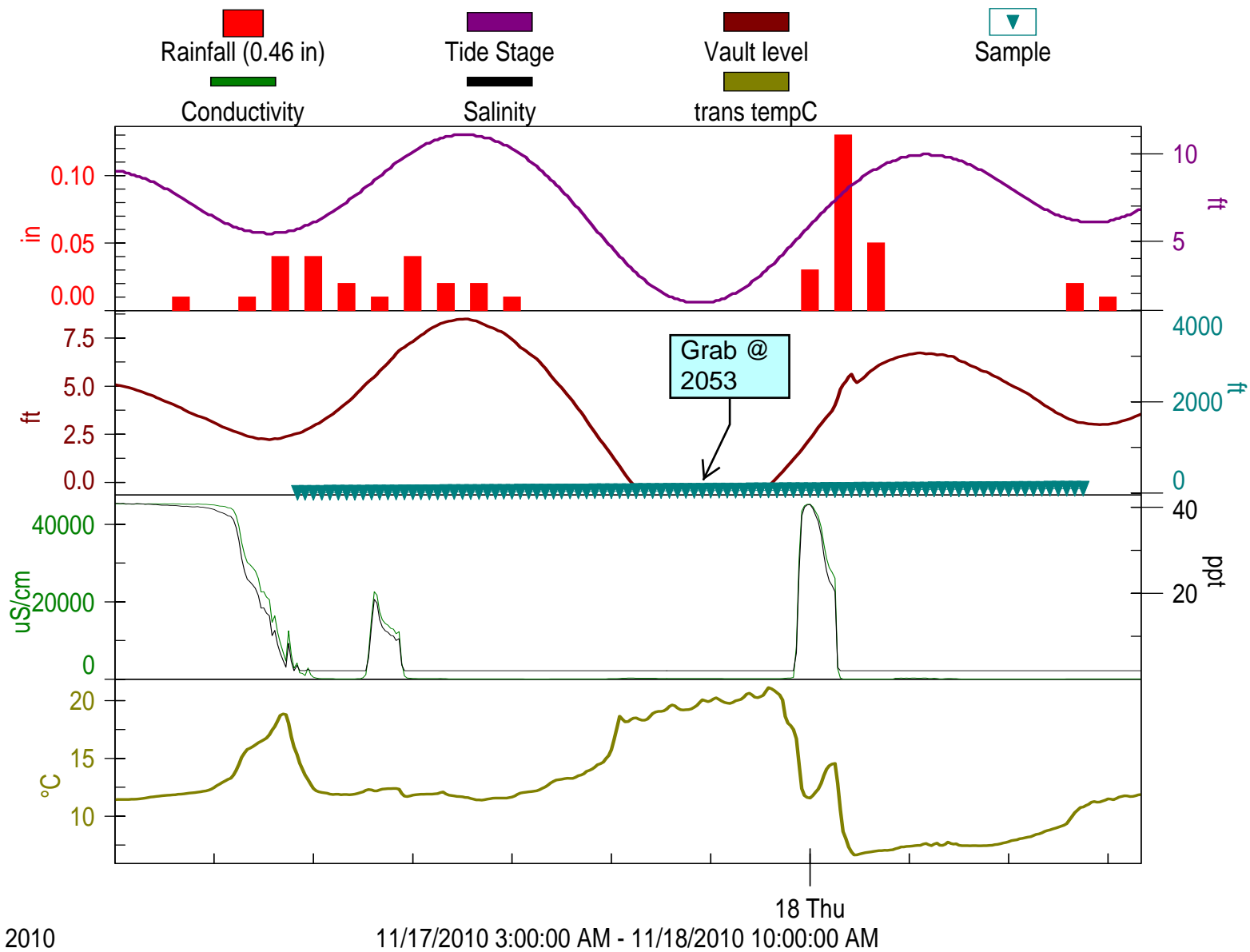
PSNS Drainage Basin	Total Basin Area (ft ²)	Type of Surface	Percentage of Drainage Basin Surface Type	Area of Basin Surface Type (ft ²)	¹ Runoff Coefficient Range	Area of Basin Surface Type with Maximum Coefficient Value Applied (ft ²)	² Total Discharge Volume (ft ³)
126	662,986	Impervious	98.55	653,373	0.6 – 0.9	588,036	R(591,881)
		Pervious	1.45	9,613	0.2 – 0.4	3,845	
096	717,872	Impervious	97	696,336	0.6 – 0.9	626,702	R(635,317)
		Pervious	3	21,536	0.2 – 0.4	8,615	
082.5	87,120	Impervious	100	87120	0.7 - 0.95	82,764	R(82,764)
081.1	965,294	Impervious	97	936,335	0.6 – 0.9	842703	R(849,074)
		Pervious	3	28,959	0.18 – 0.22	6,371	
032	208,653	Impervious	97	202,393	0.6 – 0.9	182,154	R(184,658)
		Pervious	3	6,260	0.2 – 0.4	2,504	
015	4,018,862	Impervious	50	2,009,431	0.5 – 0.8	1,607,549	R(2,411,321)
		Pervious	50	2,009,431	0.25 – 0.4	803,772	
008	553,650	Impervious	94	520,431	0.5 – 0.8	416349	R(429,637)
		Pervious	6	33,219	0.2 – 0.4	13,288	

Calculation Worksheet:

STE#1 11/17/2010

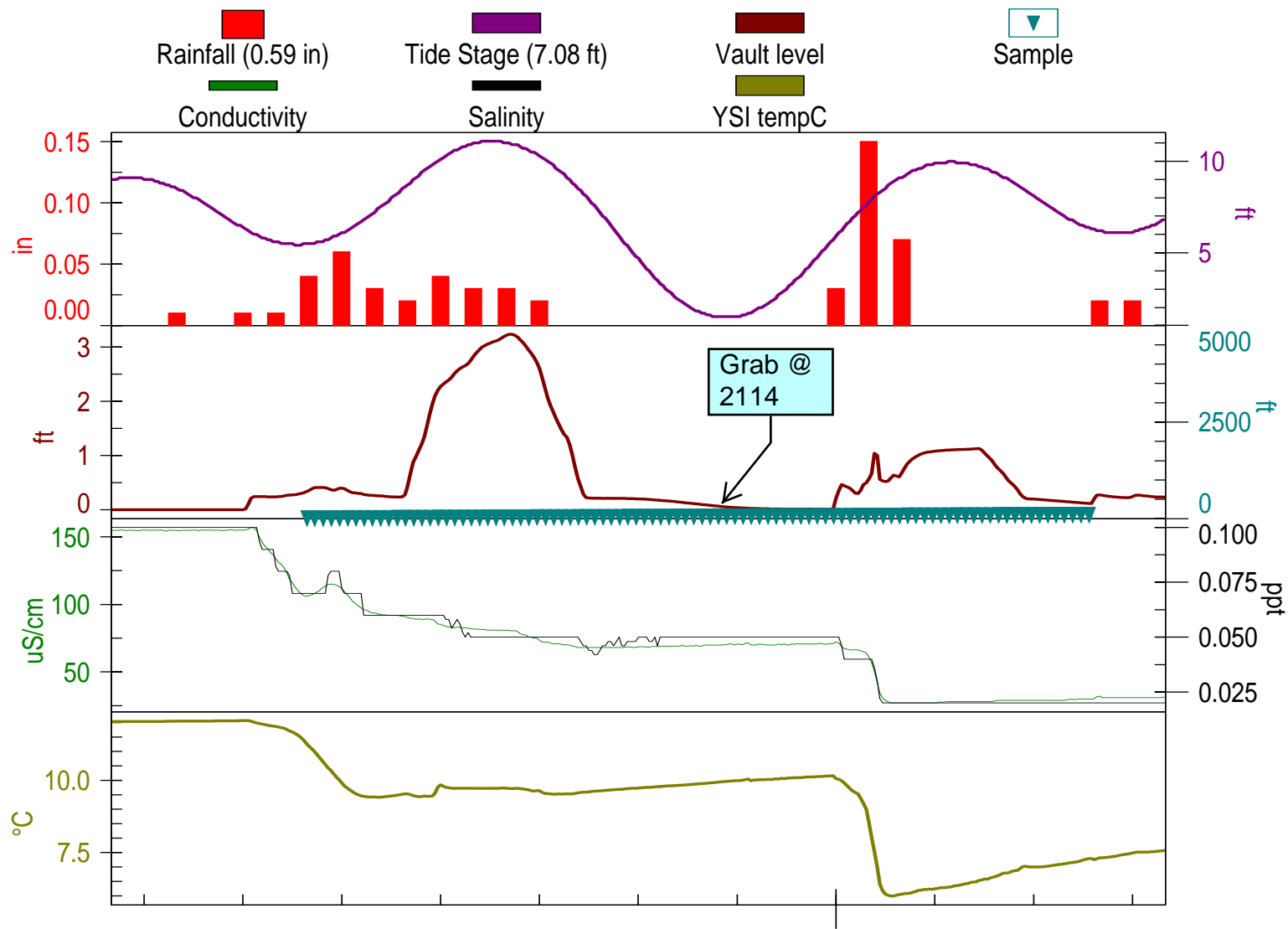
STATION	Combined Drainage Area (FT ²)	ENTER: STE Rain Total (in)	STE Rain Total (FT)	STE Runoff Vol. (gal)	ENTER: Smpl Evnt Rain Total (in)	Sampl Evnt Rain Total (FT)	Sample Event Runoff Vol. (gal)
126	591,881	0.51	0.0425	188,172.03	0.39	0.0325	143,896.25
096	635,317	0.61	0.0508	241,585.46	0.21	0.0175	83,168.77
082.5	82,764	0.59	0.0492	30,439.95	0.51	0.0425	26,312.50
081.1	849,074	0.46	0.0383	243,474.71	0.38	0.0317	201,131.28

PSNS081.1
STE#1 11-17-2010



PSNS082.5

STE#1 11-17-10

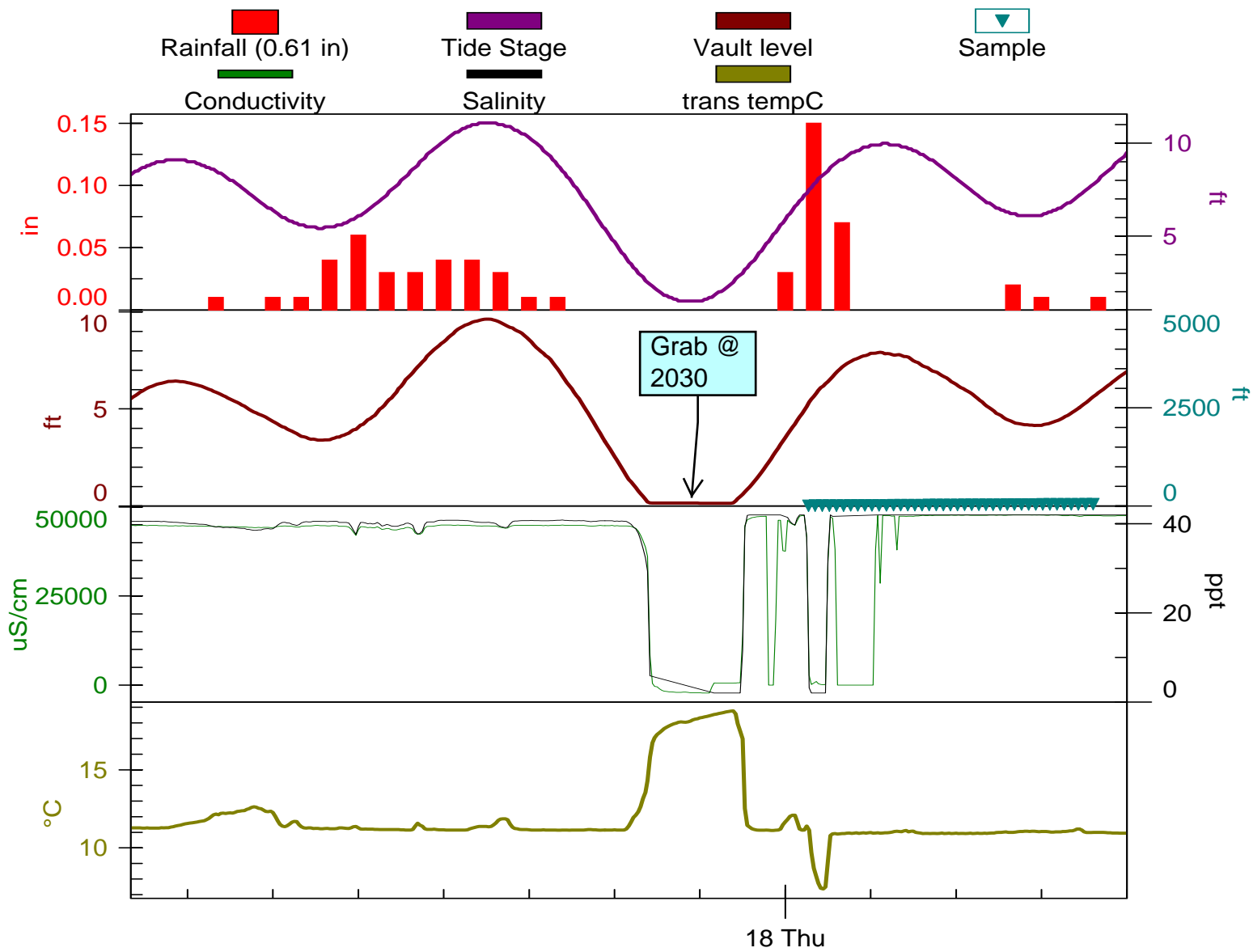


Nov 2010

11/17/2010 2:00:00 AM - 11/18/2010 10:00:00 AM

PSNS096

STE#1 11-17-10

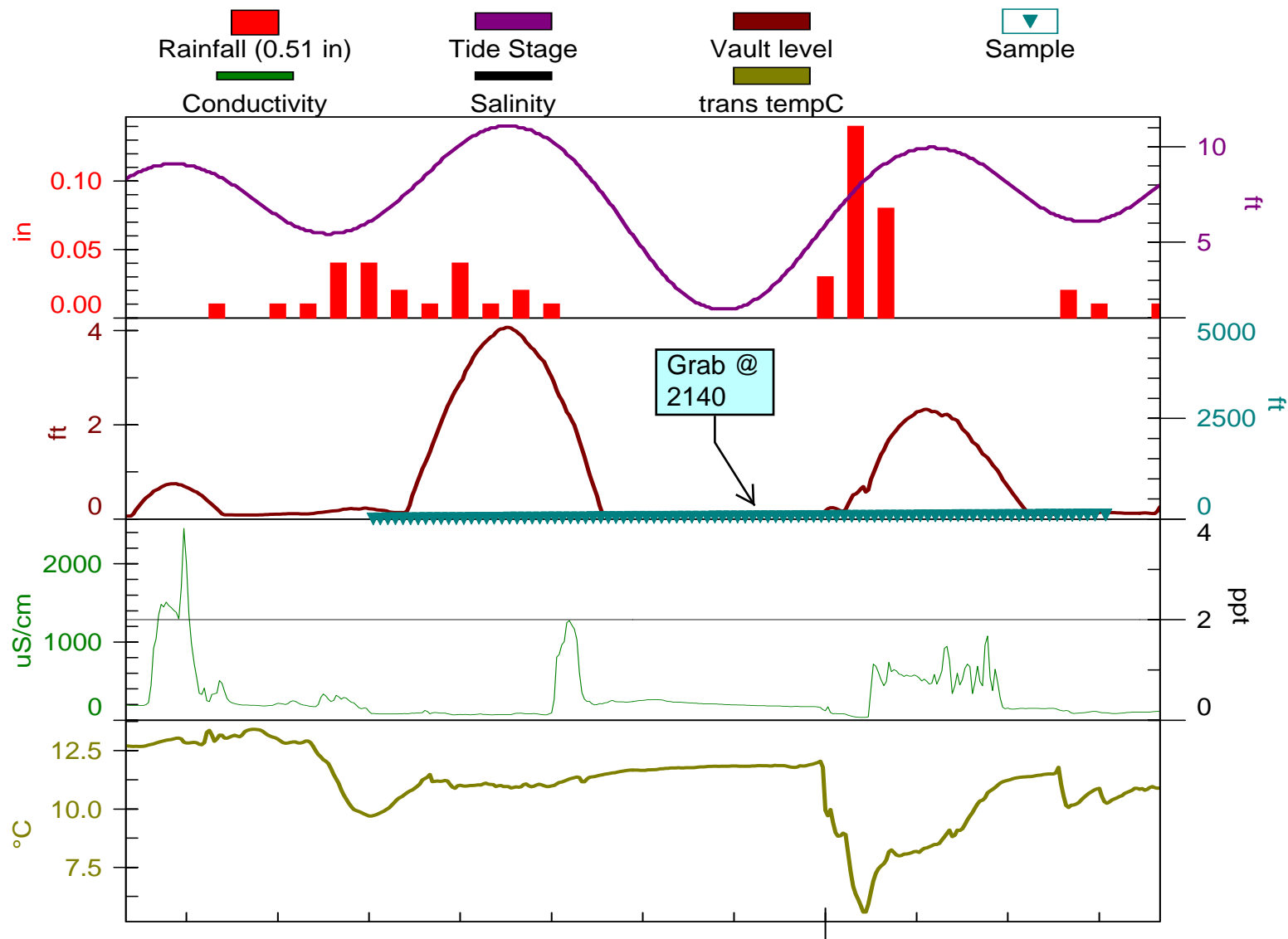


Nov 2010

11/17/2010 1:00:00 AM - 11/18/2010 12:00:00 PM

PSNS126

STE#1 11-17-10



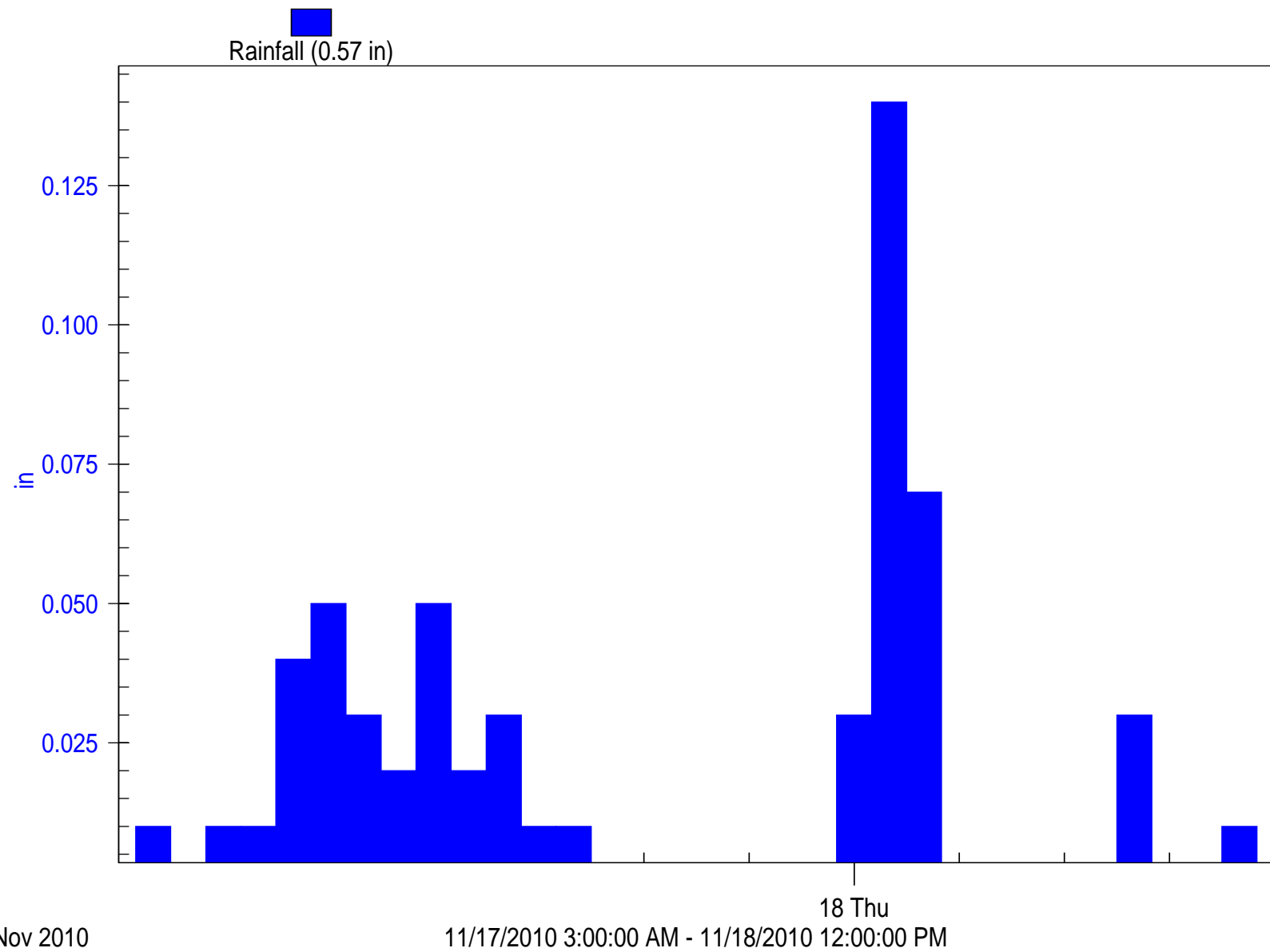
18 Thu

Nov 2010

11/17/2010 1:00:00 AM - 11/18/2010 11:00:00 AM

PSNS B427 Rain

STE#1 11-17-10



PSNS081.1 STE#1.txt

SAMPLER ID# 3293179321 09:28 18-NOV-10

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS081-1 "

SITE DESCRIPTION:

"PSNS081-1 "

UNITS SELECTED:

LENGTH: ft

24, 1000 m^l BTLS
39 ft SUCTION LINE
17 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

NO SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 m^l SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 3293179321 09:28 18-NOV-10
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS081-1
PROGRAM: PSNS081-1
Program Started at 13:48 TU 16-NOV-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID

		13:48	PGM	DISABLED	

		WE 17-NOV-10			
		08:29	PGM	ENABLED	
1,4	1	08:29	E		1290
2,4	1	08:42	F		1292
3,4	1	08:57	F		1296
4,4	1	09:12	F		1289
1,4	2	09:27	F		1273
2,4	2	09:42	F		1273
3,4	2	09:57	F		1273

PSNS081.1 STE#1.txt

4,4	2	10:12	F	1268
1,4	3	10:27	F	1255
2,4	3	10:42	F	1255
3,4	3	10:57	F	1243
4,4	3	11:12	F	1243
1,4	4	11:27	F	1219
2,4	4	11:42	F	1214
3,4	4	11:57	F	1213
4,4	4	12:12	F	1202
1,4	5	12:27	F	1207
2,4	5	12:42	F	1207
3,4	5	12:57	F	1201
4,4	5	13:12	F	1197
1,4	6	13:27	F	1193
2,4	6	13:42	F	1195
3,4	6	13:57	F	1201
4,4	6	14:12	F	1207
1,4	7	14:27	F	1201
2,4	7	14:42	F	1202
3,4	7	14:57	F	1202
4,4	7	15:12	F	1221
1,4	8	15:27	F	1217
2,4	8	15:42	F	1219
3,4	8	15:57	F	1244
4,4	8	16:12	F	1237
1,4	9	16:27	F	1261
2,4	9	16:42	F	1273
3,4	9	16:57	F	1285
4,4	9	17:12	F	1292
1,4	10	17:27	F	1303
2,4	10	17:42	F	1321
3,4	10	17:57	F	1333
4,4	10	18:12	F	1352
1,4	11	18:27	F	1375
2,4	11	18:42	F NM	*
3,4	11	18:57	F NM	*
4,4	11	19:12	F NM	*
1,4	12	19:27	F NM	*
2,4	12	19:42	F NM	*
3,4	12	19:57	F NM	*
4,4	12	20:12	F NM	*
1,4	13	20:27	F NM	*
2,4	13	20:42	F NM	*
3,4	13	20:57	F NM	*
4,4	13	21:12	F NM	*
1,4	14	21:27	F NM	*
2,4	14	21:42	F NL	*
3,4	14	21:57	F NM	*
4,4	14	22:12	F NM	*
1,4	15	22:27	F NM	*
2,4	15	22:42	F	1389
3,4	15	22:57	F	1382
4,4	15	23:12	F	1377
1,4	16	23:27	F	1375
2,4	16	23:42	F	1411
3,4	16	23:57	F	1405
-----TH 18-NOV-10-----				
4,4	16	00:12	F	1393
1,4	17	00:27	F	1340
2,4	17	00:42	F	1297
3,4	17	00:57	F	1243
4,4	17	01:12	F	1213
1,4	18	01:27	F	1239

PSNS081.1 STE#1.txt

2,4	18	01:42	F	1293
3,4	18	01:57	F	1267
4,4	18	02:12	F	1310
1,4	19	02:27	F	1441
2,4	19	02:42	F	1569
3,4	19	02:57	F	2125
4,4	19	03:12	F	1897
1,4	20	03:27	F	1867
2,4	20	03:42	F	2678
3,4	20	03:57	F	1994
4,4	20	04:12	F	2371
1,4	21	04:27	F	2694
2,4	21	04:42	F	3039
3,4	21	04:57	F	2596
4,4	21	05:12	F	3064
1,4	22	05:27	F NL	*
2,4	22	05:42	F NL	*
3,4	22	05:57	F NL	*
4,4	22	06:12	F NL	*
1,4	23	06:27	F NL	*
2,4	23	06:42	F NL	*
3,4	23	06:57	F NL	*
4,4	23	07:12	F NL	*
1,4	24	07:27	F NL	*
2,4	24	07:42	F NL	*
3,4	24	07:57	F NL	*
4,4	24	08:12	F NL	*
08:14 PGM DONE 18-NOV				

SOURCE E ==> ENABLE

SOURCE F ==> FLOW

ERROR NL ==> NO LIQUID DETECTED!

ERROR NM ==> NO MORE LIQUID!

PSNS082.5 STE#1.txt

SAMPLER ID# 2483481595 09:21 18-NOV-10

Hardware: B2 Software: 3.21

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS082-5 "

SITE DESCRIPTION:

"PSNS082-5 "

UNITS SELECTED:

LENGTH: ft

24, 1000 m^l BTLS
13 ft SUCTION LINE
AUTO SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

NO SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 m^l SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 2483481595 09:21 18-NOV-10
Hardware: B2 Software: 3.21
***** SAMPLING RESULTS *****
SITE: PSNS082-5
PROGRAM: PSNS082-5
Program Started at 14:13 TU 16-NOV-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID

		14:13	PGM	DISABLED	

		WE 17-NOV-10	PGM	ENABLED	
		07:55	PGM	ENABLED	
1,4	1	07:55	E		378
2,4	1	08:09	F		378
3,4	1	08:24	F		380
4,4	1	08:39	F		380
1,4	2	08:54	F		383
2,4	2	09:09	F		382
3,4	2	09:24	F		379

PSNS082.5 STE#1.txt

4,4	2	09:39	F		382
1,4	3	09:54	F	NM	*
2,4	3	10:09	F	NL	*
3,4	3	10:24	F	NL	*
4,4	3	10:39	F	NL	*
1,4	4	10:54	F		387
2,4	4	11:09	F		380
3,4	4	11:24	F		383
4,4	4	11:39	F		376
1,4	5	11:54	F		380
2,4	5	12:09	F		379
3,4	5	12:24	F		376
4,4	5	12:39	F		375
1,4	6	12:54	F		374
2,4	6	13:09	F		374
3,4	6	13:24	F		374
4,4	6	13:39	F		374
1,4	7	13:54	F		374
2,4	7	14:09	F		375
3,4	7	14:24	F		374
4,4	7	14:39	F		374
1,4	8	14:54	F		375
2,4	8	15:09	F		380
3,4	8	15:24	F		377
4,4	8	15:39	F		380
1,4	9	15:54	F		384
2,4	9	16:09	F		381
3,4	9	16:24	F	NL	*
4,4	9	16:39	F	NL	*
1,4	10	16:54	F	NL	*
2,4	10	17:09	F	NL	*
3,4	10	17:24	F	NL	*
4,4	10	17:39	F	NL	*
1,4	11	17:54	F	NL	*
2,4	11	18:09	F	NL	*
3,4	11	18:24	F	NL	*
4,4	11	18:39	F	NL	*
1,4	12	18:54	F	NL	*
2,4	12	19:09	F	NL	*
3,4	12	19:24	F	NL	*
4,4	12	19:39	F	NL	*
1,4	13	19:54	F	NL	*
2,4	13	20:09	F	NL	*
3,4	13	20:24	F	NL	*
4,4	13	20:39	F	NL	*
1,4	14	20:54	F	NL	*
2,4	14	21:09	F	NL	*
3,4	14	21:24	F	NL	*
4,4	14	21:39	F	NL	*
1,4	15	21:54	F	NL	*
2,4	15	22:09	F	NL	*
3,4	15	22:24	F	NL	*
4,4	15	22:39	F	NL	*
1,4	16	22:54	F	NL	*
2,4	16	23:09	F	NL	*
3,4	16	23:24	F	NL	*
4,4	16	23:39	F	NL	*
1,4	17	23:54	F	NL	*
-----TH 18-NOV-10-----					
2,4	17	00:09	F		384
3,4	17	00:24	F		384
4,4	17	00:39	F		386
1,4	18	00:54	F		384

```

PSNS082.5 STE#1.txt
2,4 18 01:09 F 380
3,4 18 01:24 F 382
4,4 18 01:39 F 384
1,4 19 01:54 F 381
2,4 19 02:09 F 382
3,4 19 02:24 F 382
4,4 19 02:39 F 382
1,4 20 02:54 F 382
2,4 20 03:09 F 380
3,4 20 03:24 F 382
4,4 20 03:39 F 382
1,4 21 03:54 F 382
2,4 21 04:09 F 382
3,4 21 04:24 F 382
4,4 21 04:39 F 382
1,4 22 04:54 F 382
2,4 22 05:09 F 382
3,4 22 05:24 F 382
4,4 22 05:39 F NL *
1,4 23 05:54 F NL *
2,4 23 06:09 F NL *
3,4 23 06:24 F NL *
4,4 23 06:39 F NL *
1,4 24 06:54 F NL *
2,4 24 07:09 F NL *
3,4 24 07:24 F NL *
4,4 24 07:39 F NL *
07:40 PGM DONE 18-NOV

```

```

SOURCE E ==> ENABLE
SOURCE F ==> FLOW
ERROR NL ==> NO LIQUID DETECTED!
ERROR NM ==> NO MORE LIQUID!

```

```

-----
SAMPLER ID# 2483481595 09:21 18-NOV-10
Hardware: B2 Software: 3.21
MODULE: NONE
Hardware: Software: 0.00
***** COMBINED RESULTS *****
SITE: PSNS082-5
PROGRAM: PSNS082-5
Program Started at 14:13 TU 16-NOV-10
Nominal Sample Volume = 240 ml

```

```

MODULE: NONE
-----

```

```

SAMPLER ID# 2483481595 09:21 18-NOV-10
Hardware: B2 Software: 3.21
***** COMBINED RESULTS *****
SITE: PSNS082-5
PROGRAM: PSNS082-5
Program Started at 14:13 TU 16-NOV-10
Nominal Sample Volume = 240 ml
FR-TEMP
SAMPLE BOTTLE TIME C

```


PSNS082.5 STE#1.txt

NO FR-TEMPERATURE

PSNS096 STE#1.txt

SAMPLER ID# 3293179316 12:22 18-NOV-10
Hardware: B2 Software: 3.26
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"PSNS096"
SITE DESCRIPTION:
"PSNS096"

UNITS SELECTED:
LENGTH: ft

24, 1000 m^l BTLS
20 ft SUCTION LINE
17 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
NO SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 m^l SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 3293179316 12:22 18-NOV-10
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS096
PROGRAM: PSNS096
Program Started at 11:33 TU 16-NOV-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID
-----	-----	-----	---	---	-----
		11:33	PGM	DISABLED	
		TH 18-NOV-10			
		00:47	PGM	ENABLED	
1,4	1	00:47	E		612
2,4	1	01:00	F		606
3,4	1	01:15	F		607
4,4	1	01:30	F		612
1,4	2	01:45	F		606
2,4	2	02:00	F		606
3,4	2	02:15	F		606

PSNS096 STE#1.txt

4,4	2	02:30	F	600
1,4	3	02:45	F	600
2,4	3	03:00	F	599
3,4	3	03:15	F	595
4,4	3	03:30	F	600
1,4	4	03:45	F	600
2,4	4	04:00	F	601
3,4	4	04:15	F	606
4,4	4	04:30	F	600
1,4	5	04:45	F	611
2,4	5	05:00	F	605
3,4	5	05:15	F	606
4,4	5	05:30	F	606
1,4	6	05:45	F	612
2,4	6	06:00	F	612
3,4	6	06:15	F	613
4,4	6	06:30	F	612
1,4	7	06:45	F	613
2,4	7	07:00	F	619
3,4	7	07:15	F	624
4,4	7	07:30	F	624
1,4	8	07:45	F	629
2,4	8	08:00	F	624
3,4	8	08:15	F	624
4,4	8	08:30	F	630
1,4	9	08:45	F	630
2,4	9	09:00	F	630
3,4	9	09:15	F	629
4,4	9	09:30	F	630
		09:40	MANUAL PAUSE	
		09:40	MANUAL RESUME	
1,4	10	09:45	F	624
2,4	10	10:00	F	624
3,4	10	10:15	F	618
4,4	10	10:30	F	618
		10:43	MANUAL PAUSE	
		10:43	PGM STOPPED 18-NOV	

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW

PSNS126 STE#1.txt

SAMPLER ID# 2425481222 09:07 18-NOV-10
Hardware: B2 Software: 3.26
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"126"
SITE DESCRIPTION:
"126"

UNITS SELECTED:
LENGTH: ft

24, 1000 m^l BTLS
18 ft SUCTION LINE
13 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
NO SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 m^l SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 2425481222 09:07 18-NOV-10
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: 126
PROGRAM: 126
Program Started at 10:32 TU 16-NOV-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID

		10:32	PGM	DISABLED	

		WE 17-NOV-10			
		09:05	PGM	ENABLED	
1,4	1	09:05	E		675
2,4	1	09:19	F		668
3,4	1	09:34	F		671
4,4	1	09:49	F		676
1,4	2	10:04	F		675
2,4	2	10:19	F		671
3,4	2	10:34	F		665

PSNS126 STE#1.txt

4,4	2	10:49	F	662
1,4	3	11:04	F	661
2,4	3	11:19	F	658
3,4	3	11:34	F	654
4,4	3	11:49	F	651
1,4	4	12:04	F	652
2,4	4	12:19	F	645
3,4	4	12:34	F	639
4,4	4	12:49	F	641
1,4	5	13:04	F	638
2,4	5	13:19	F	640
3,4	5	13:34	F	639
4,4	5	13:49	F	640
1,4	6	14:04	F	639
2,4	6	14:19	F	640
3,4	6	14:34	F	639
4,4	6	14:49	F	640
1,4	7	15:04	F	650
2,4	7	15:19	F	652
3,4	7	15:34	F	651
4,4	7	15:49	F	659
1,4	8	16:04	F	665
2,4	8	16:19	F	668
3,4	8	16:34	F	675
4,4	8	16:49	F	676
1,4	9	17:04	F	675
2,4	9	17:19	F	676
3,4	9	17:34	F	674
4,4	9	17:49	F	678
1,4	10	18:04	F	674
2,4	10	18:19	F	676
3,4	10	18:34	F	674
4,4	10	18:49	F	673
1,4	11	19:04	F	676
2,4	11	19:19	F	675
3,4	11	19:34	F	682
4,4	11	19:49	F	672
1,4	12	20:04	F	673
2,4	12	20:19	F	670
3,4	12	20:34	F	672
4,4	12	20:49	F	672
1,4	13	21:04	F	678
2,4	13	21:19	F	674
3,4	13	21:34	F	678
4,4	13	21:49	F	675
1,4	14	22:04	F	676
2,4	14	22:19	F	674
3,4	14	22:34	F	679
4,4	14	22:49	F	674
1,4	15	23:04	F	676
2,4	15	23:19	F	669
3,4	15	23:34	F	674
4,4	15	23:49	F	678
-----TH 18-NOV-10-----				
1,4	16	00:04	F	680
2,4	16	00:19	F	680
3,4	16	00:34	F	674
4,4	16	00:49	F	678
1,4	17	01:04	F	674
2,4	17	01:19	F	672
3,4	17	01:34	F	666
4,4	17	01:49	F	657
1,4	18	02:04	F	656

```

PSNS126 STE#1.txt
2,4 18 02:19 F 656
3,4 18 02:34 F 656
4,4 18 02:49 F 650
1,4 19 03:04 F 649
2,4 19 03:19 F 650
3,4 19 03:34 F 650
4,4 19 03:49 F 654
1,4 20 04:04 F 651
2,4 20 04:19 F 652
3,4 20 04:34 F 656
4,4 20 04:49 F 656
1,4 21 05:04 F 662
2,4 21 05:19 F 660
3,4 21 05:34 F 666
4,4 21 05:49 F 662
1,4 22 06:04 F 666
2,4 22 06:19 F 663
3,4 22 06:34 F 676
4,4 22 06:49 F 674
1,4 23 07:04 F 672
2,4 23 07:19 F 678
3,4 23 07:34 F 669
4,4 23 07:49 F 674
1,4 24 08:04 F 679
2,4 24 08:19 F 674
3,4 24 08:34 F 678
4,4 24 08:49 F 669
08:50 PGM DONE 18-NOV

```

```

SOURCE E ==> ENABLE
SOURCE F ==> FLOW

```

```

-----
SAMPLER ID# 2425481222 09:08 18-NOV-10
Hardware: B2 Software: 3.26
MODULE: NONE
Hardware: Software: 0.00
***** COMBINED RESULTS *****
SITE: 126
PROGRAM: 126
Program Started at 10:32 TU 16-NOV-10
Nominal Sample Volume = 240 ml

```

```

MODULE: NONE
-----

```

```

SAMPLER ID# 2425481222 09:08 18-NOV-10
Hardware: B2 Software: 3.26
***** COMBINED RESULTS *****
SITE: 126
PROGRAM: 126
Program Started at 10:32 TU 16-NOV-10
Nominal Sample Volume = 240 ml
FR-TEMP
SAMPLE BOTTLE TIME C
-----
NO FR-TEMPERATURE

```

SAMPLER ID# 2425481222 09:08 18-NOV-10
Hardware: B2 Software: 3.26
***** COMBINED RESULTS *****
SITE: 126
PROGRAM: 126
Program Started at 10:32 TU 16-NOV-10
Nominal Sample Volume = 240 ml
SAMPLE BOTTLE TIME

NO RAIN GAGE

SAMPLER ID# 2425481222 09:08 18-NOV-10
Hardware: B2 Software: 3.26
YSI SONDE
Software: 1.11
***** COMBINED RESULTS *****
SITE: 126
PROGRAM: 126
Program Started at 10:32 TU 16-NOV-10
Nominal Sample Volume = 240 ml

NO YSI SONDE

National Weather Service National Headquarters

National Weather Service

Area Forecast Discussion

Issued by NWS Seattle/Tacoma, WA

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000
FXUS66 KSEW 170455
AFDSEW

[AREA FORECAST DISCUSSION](#)

NATIONAL WEATHER SERVICE SEATTLE WA
900 PM PST TUE NOV 16 2010

.SYNOPSIS...A VIGOROUS FRONTAL SYSTEM WILL BRING SPREAD RAIN OVER THE AREA LATE TONIGHT INTO WEDNESDAY MORNING. [HEAVY SNOW](#) WILL FALL IN THE MOUNTAINS WEDNESDAY AND WEDNESDAY NIGHT. THE WEATHER WILL REMAIN [UNSETTLED](#) WITH PERIODS OF RAIN THROUGH FRIDAY. COLDER WEATHER WITH A CHANCE OF SNOW IS IN THE FORECAST FOR THE WEEKEND AND EARLY NEXT WEEK.

&&

.SHORT TERM...A [DEEPENING](#) LOW NEAR 50N 135W IS ASSOCIATED WITH A STRONG 170 [KT](#) 300 [MB](#) [JET](#). MODELS APPEAR ON TRACK IN DEVELOPING THE SYSTEM TO A 980-985 [MB](#) LOW OFF THE SOUTH TIP OF THE CHARLOTTEES BEFORE BRINGING IT SOUTH IN A DECAYING MODE INTO THE OFFSHORE WATERS. RAIN AND MOUNTAIN SNOW ASSOCIATED WITH THIS SYSTEMS [FRONT](#) WILL SPREAD ONSHORE DURING THE EARLY MORNING HOURS WED WITH THE [FRONT](#) MOVING THROUGH WESTERN WASHINGTON BY 18Z WED. 12 HOUR [QPF](#) WED IN THE CASCADES ARE 1.0-1.5 INCHES WITH SNOW LEVELS GENERALLY AROUND 3000 FEET MEANS THAT THE WINTER STORM [WARNING](#) FOR THE CASCADES LOOKS GOOD. A BRIEF PERIOD OF POST FRONTAL WESTERLY [FLOW](#) WILL [LIKELY](#) KEEP THE SNOW GOING IN THE CASCADES INTO WED EVENING.

IT WILL GET WINDY AROUND THE NORTH INTERIOR AND ALONG THE COAST AS THE [FRONT](#) MOVES THROUGH. BUT WITH THE STRENGTH OF THE [JET](#)...IT APPEARS THAT THE PREFRONTAL SELV WINDS IN THE NORTH INTERIOR SHOULD REMAIN JUST BELOW WIND ADVISORY LEVEL. POST FRONTAL [WESTERLIES](#) WED AFTERNOON AND EVENING ARE EXPECTED TO BE MUCH LIGHTER THAN WHAT WAS EXPERIENCED TUE EVENING.

THU WE WILL [LIKELY](#) BE IN A RELATIVE BREAK BETWEEN WEDNESDAYS [FRONT](#) AND [MOISTURE](#) AND ENERGY WRAPPING AROUND THE OFFSHORE LOW. WILL [LIKELY](#) SEE CLOUDS...SHOWERS...MAYBE SOME SUNBREAKS...AND TEMPERATURES IN THE 40S.

THE INCOMING [GFS](#) SOLUTION TAKES THE DECAYING LOW ABEAM OF THE SW WA COAST THU EVENING AND THAT SHOULD ALLOW SOME OF THE COLD AIR DEVELOPING OVER WESTERN CANADA TO FILTER INTO W WA. WET BULB COOLING WITH LIGHT TO MODERATE [NELY](#) LOW LEVEL [FLOW](#) AND TEMPERATURES AT 850 [MB](#) ON THE ORDER OF -3C TO -5C MAY RESULT IN SOME [MIXED PRECIPITATION](#) IF IT IS HEAVY ENOUGH. ON FRI...THE [GFS](#) SHOWS AREAS AROUND BELLINGHAM AND THE E SLOPES OF THE OLYMPICS...HOOD CANAL AREA...AND THE KITSAP PENINSULA POTENTIALLY SEEING SOME SNOW. TEMPERATURES ARE NEAR MARGINAL THOUGH. WITH THE CONTINUED UNCERTAINTY...PEOPLE AROUND THE AREA WILL NEED TO CONTINUE TO CLOSELY MONITOR FORECASTS WHICH AT THIS TIME ARE LOW CONFIDENCE. ALBRECHT

.LONG TERM...PREVIOUS LONG TERM DISCUSSION FOLLOWS...THERE APPEAR TO BE AT LEAST TWO PATHS TO SNOW IN THE EXTENDED. ONE IS SIMPLY THAT COLD AIR ASSOCIATED WITH A DEEP LOW OFFSHORE STAYS PARKED OVER WESTERN WASHINGTON. ANY SHOWERS OR RAIN COULD EASILY HAVE SOME SNOW COMPONENT. LOWS EACH NIGHT STARTING ABOUT FRIDAY NIGHT WILL BE IN THE LOW TO MID 30S. HAVE USED CHANCE WORDING AND RAIN OR [SNOW SHOWER](#) WORDING FOR MOST OF THE EXTENDED.

THE OTHER WAY INVOLVES MODIFIED ARCTIC AIR MOVING SOUTH OUT OF CANADA. NEITHER THE EURO NOR THE [GFS](#) ARE PARTICULARLY STRONG AT BRINGING COLD AIR SOUTH...BUT IT REMAINS A POSSIBILITY. IF THAT HAPPENS THE [AIR MASS](#) WILL CERTAINLY BE COLD ENOUGH FOR SNOW. HOWEVER THE COLD AIR COULD SIMPLY PUSH ALL THE CLOUDS OUT OF THE AREA. THE MODELS ALSO SEEM TO BE HINTING AT THIS OUTCOME AS SUNDAY AND MONDAY BOTH LOOK PRETTY DRY. WITH ALL THE UNCERTAINTY HAVE BASICALLY A BROAD BRUSH CHANCE OF RAIN OR SNOW SHOWERS FORECAST.

THE EURO WARMS THINGS UP STARTING TUESDAY WHILE THE [GFS](#) DOES NOT.

HAVE LEANED TOWARD THE EURO ON TUESDAY. BURKE

&&

.[HYDROLOGY](#)...PREVIOUS [HYDROLOGY](#) DISCUSSION FOLLOWS...FORECAST MODELS DO NOT SHOW A SIGNIFICANT THREAT OF FLOODING FOR WESTERN WASHINGTON...INCLUDING THE GREEN RIVER...OVER THE NEXT TEN DAYS.

THE VIGOROUS SYSTEM FOR WEDNESDAY AND WEDNESDAY NIGHT DOES NOT PRESENT ANY [FLOOD](#) THREAT. IT WILL BE ACCOMPANIED BY SNOW LEVELS IN THE 2000 TO 3000 [FT](#) RANGE...AND IT WILL BE MAINLY A SNOW PRODUCER FOR THE MOUNTAINS. DURING THIS EVENT THE SKOKOMISH IS THE ONLY RIVER [BASIN](#) THAT MAY RECEIVE HYDROLOGICALLY SIGNIFICANT [RAINFALL](#). TOTAL RAIN AMOUNTS DO NOT LOOK LIKE NEAR ENOUGH TO CAUSE [FLOODING](#) AND THE SKOKOMISH RIVER SHOULD ONLY EXPERIENCE A MODERATE RISE.

FOR THURSDAY AND BEYOND...HYDROLOGICALLY SIGNIFICANT PRECIPITATION IS NOT IN THE FORECAST. BURKE

&&

.AVIATION...A FRONTAL SYSTEM ASSOCIATED WITH A RAPIDLY [DEEPENING](#) LOW PRESSURE CENTER IS COMING TOGETHER OVER THE [B.C.](#) AND WA OFFSHORE WATERS THIS EVENING. THE [NAM](#) HAS THE LOW PEGGED AT 999MB AT 03Z...BETWEEN BUOYS 004 AND 036. THE LOW IS [FCST](#) TO BOTTOM OUT [ARND](#) 975MB AS IT REACHES THE SOUTH TIP OF THE CHARLOTTES AT 12Z. THE ASSOCIATED [FRONT](#) WILL BE DRAPED ACROSS VANCOUVER ISLAND OVERNIGHT AND MOVING THRU WRN WA WED DURING THE DAY...THE [FRONT](#) IS OVER NW ORE/SW WA AND INTO THE CASCADES BY LATE AFTERNOON. EXPECT RAIN WITH TYPICALLY LOW CIGS AND AREAS OF REDUCED [VSBY](#)...WITH THE HILLS AND MOUNTAINS OBSCURED WED AND SOME 3-5SM [RA](#) WITH [MVFR](#) CIGS WITH THE [FRONT](#) AND GUSTY SLY WINDS. 19

KSEA...CURRENT [TAF](#) LOOKS GOOD...THE WORST [VSBY](#) AND CIGS SHOULD BE MIDDAY WITH THE [FRONT](#) ITSELF.

&&

.MARINE...A FRONTAL SYSTEM ASSOCIATED WITH A RAPIDLY [DEEPENING](#) LOW PRESSURE CENTER IS COMING TOGETHER OVER THE [B.C.](#) AND WA OFFSHORE WATERS THIS EVENING. THE [NAM](#) HAS THE LOW PEGGED AT 999MB AT 03Z...BETWEEN BUOYS 004 AND 036. THE LOW IS [FCST](#) TO BOTTOM OUT [ARND](#) 975MB AS IT REACHES THE SOUTH TIP OF THE CHARLOTTES AT 12Z. THE ASSOCIATED [FRONT](#) WILL BE DRAPED ACROSS VANCOUVER ISLAND OVERNIGHT AND MOVING THRU WRN WA WED DURING THE DAY...THE [FRONT](#) IS OVER NW ORE/SW WA AND INTO THE CASCADES BY LATE AFTERNOON. THIS LOOKS LIKE A TYPICAL SLY [GALE](#) FOR MOST OF THE MARINE AREAS...THE 12Z 4KM WRFGFS HAD THE STRONGEST WIND AT 18Z WHICH WAS SE40KT IN A COUPLE PATCHES OVER THE NRN INLAND WATERS SO WILL ADD 5KT TO THAT [FCST](#) OTHERWISE NO SIGNIFICANT CHANGES EXPECTED TO THE CWF. 19

&&

.SEW WATCHES/WARNINGS/ADVISORIES...
WA...WINTER STORM [WARNING](#) FOR THE CASCADES.
[WINTER WEATHER ADVISORY](#) FOR THE OLYMPICS.
PZ...[GALE WARNING COASTAL WATERS](#)...EAST AND WEST STRAIT OF JUAN DE FUCA...NORTHERN INLAND WATERS...ADMIRALTY INLET.
[SMALL CRAFT ADVISORY](#) PUGET SOUND/HOOD CANAL...CENTRAL STRAIT OF JUAN DE FUCA.
[SMALL CRAFT ADVISORY](#) GRAYS HARBOR [BAR](#).


\$\$

FOR AN ILLUSTRATED VERSION OF THE FORECAST DISCUSSION...PLEASE SEE [WWW.WEATHER.GOV/SEATTLE/GAFD/LATEST_WEBAFD.HTML](http://www.weather.gov/seattle/GAFD/LATEST_WEBAFD.HTML).

National Weather Service
National Weather Service National Headquarters
1325 East West Highway
Silver Spring, MD 20910
Incorrect Region Format!
Web Master's E-mail: [NWS Internet Services Team](#)
Page last modified: Feb 16th, 2010 21:51 UTC


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NWS Seattle, WA


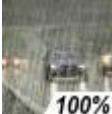






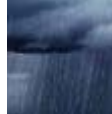
Point Forecast: Bremerton WA
47.56°N 122.65°W (Elev. 0 ft)

[Mobile Weather Information](#) | [En Español](#)

Last Update: 3:45 pm PST Nov 16, 2010

Forecast Valid: 10pm PST Nov 16, 2010-6pm PST Nov 23, 2010

Forecast at a Glance

Tonight	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday	Friday Night	Saturday	Saturday Night
								
40%	100%	100%	70%	70%	70%	50%		
Chance Rain	Rain	Showers	Showers Likely	Showers Likely	Showers Likely	Chance Showers	Chance Showers	Chance Showers
Lo 43 °F	Hi 47 °F	Lo 41 °F	Hi 45 °F	Lo 34 °F	Hi 43 °F	Lo 35 °F	Hi 41 °F	Lo 34 °F

Detailed 7-day Forecast

Detailed Point Forecast [Move Down]

Hazardous weather condition(s):

Special Weather Statement

Tonight: A 40 percent chance of rain. Cloudy, with a low around 43. South wind around 8 mph.

Wednesday: Rain. High near 47. Breezy, with a south wind around 25 mph. Chance of precipitation is 100%.

Wednesday Night: Showers, mainly before 10pm. Low around 41. South southwest wind between 9 and 18 mph. Chance of precipitation is 100%.

Thursday: Showers likely, mainly after 10am. Cloudy, with a high near 45. South southwest wind between 11 and 13 mph. Chance of precipitation is 70%.

Thursday Night: Showers likely. Cloudy, with a low around 34. South southwest wind between 9 and 11 mph. Chance of precipitation is 70%.

Friday: Showers likely. Cloudy, with a high near 43. Chance of precipitation is 70%.

Friday Night: A 50 percent chance of showers. Cloudy, with a low around 35.

Saturday: A chance of showers. Mostly cloudy, with a high near 41.

Saturday Night: A chance of showers. Cloudy, with a low around 34.

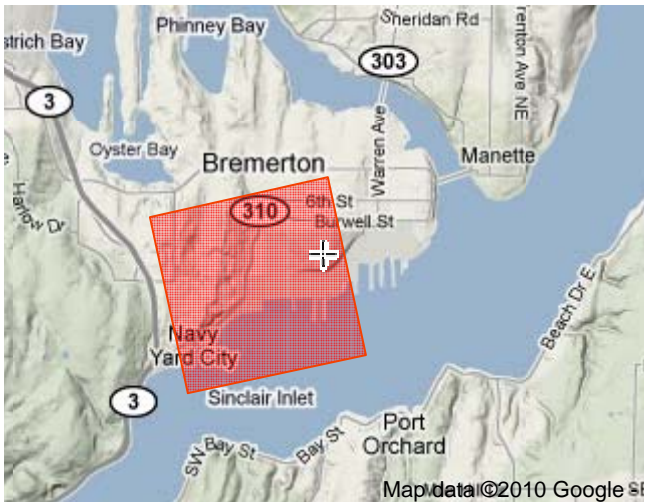
Sunday: A chance of showers. Mostly cloudy, with a high near 41.

Sunday Night: A chance of showers. Mostly cloudy, with a low around 32.



Monday: A chance of showers. Cloudy, with a high near 41.

Monday Night: A chance of showers. Mostly cloudy, with a low around 33.

Click Map for Forecast [Disclaimer](#)



Requested Location ■ Forecast Area
Lat/Lon: 47.56°N 122.65°W **Elevation:** 0 ft

Current Conditions [Move Up]

Bremerton, Bremerton National Airport

Last Update on 16 Nov 20:55 PST

Overcast

45°F
(7°C)

Humidity: 76 %

Wind Speed: S 10 MPH

Barometer: 30.12 in (N/A mb)

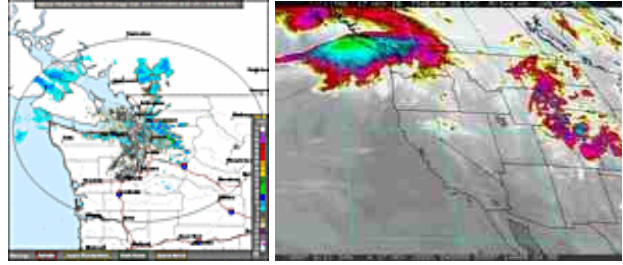
Dewpoint: 37°F (3°C)

Visibility: 10.00 Miles

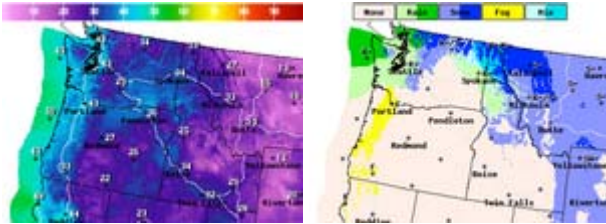
[More Local Wx:](#) [3 Day History:](#)

Radar and Satellite Images

Tuesday: A chance of showers. Mostly cloudy, with a high near 40.



National Digital Forecast Database



Additional Forecasts & Information

[Zone Area Forecast for Seattle/Bremerton Area, WA](#)
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Point Forecast: Bremerton WA
47.56N 122.65W (Elev. 0 ft)

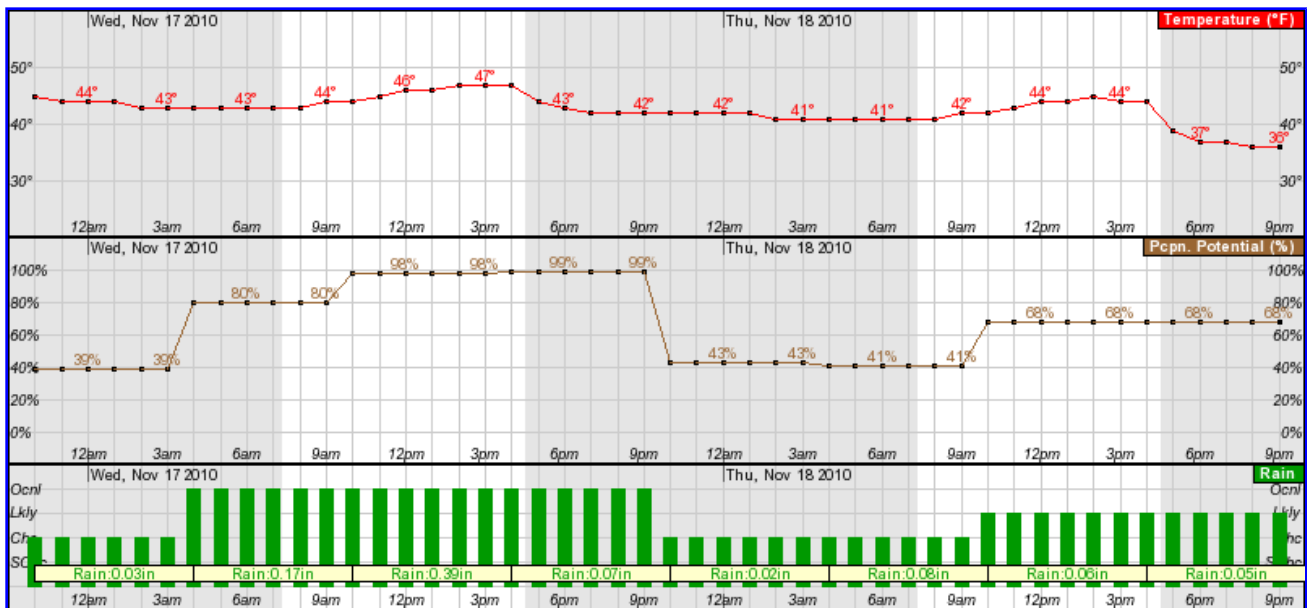
Search for: ☒ NWS ☐ All NOAA

Last Update: 3:45 pm PST Nov 16, 2010

Hourly Weather Forecast Graph

[\[dashes/dots\]](#) | [\[b/w\]](#) | [\[hide menu\]](#)

Weather Elements		Weather/Precipitation
<input checked="" type="checkbox"/> Temperature (°F)	<input type="checkbox"/> Surface Wind <input type="text" value="mph"/>	<input type="checkbox"/> Thunder
<input type="checkbox"/> Dewpoint (°F)	<input type="checkbox"/> Sky Coverage	<input checked="" type="checkbox"/> Rain
<input type="checkbox"/> Wind Chill (°F)	<input checked="" type="checkbox"/> Precipitation Potential	<input type="checkbox"/> Snow
	<input type="checkbox"/> Relative Humidity	<input type="checkbox"/> Freezing Rain
		<input type="checkbox"/> Sleet

48-Hour Period Starting: 

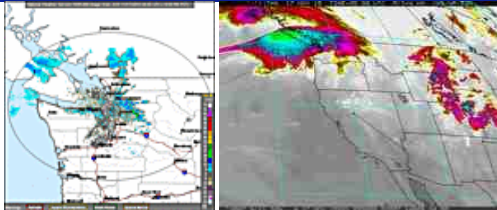
Thursday, November 18 at 10am

Temperature: 42 °F

Precipitation Potential: 68%

Rain: Likely (60%-70%)

Radars and Satellite Images



Additional Forecasts & Information

[International System of Units](#)[Forecast Discussion](#)[7-Day Forecast](#)[Tabular Forecast](#)[Quick Forecast](#)

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WA | OR | CA

Forecasts

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Public Text Fcsts
Aviation
Marine
Fire Weather
Activity Planner
Mountains
Hydrology
Model Forecasts
GIS Shapefiles
Canada / Int'l

Experimental...

Digital / Gridded
Wx Point Matrix:
Marine / Fire Wx
Precip Estimates

Climate/Historical

Local
National
NowData
More...

Weather Safety

Weather Radio
Safety Info
StormReady

Outreach

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CoCoRaHS

Reports

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Warnings and/or Advisories In Effect for this Point:

Special Weather StatementFor warnings and/or advisories in effect for adjacent areas to this point,
see <http://www.wrh.noaa.gov/sew>Change Table Font Size [Increase](#) [Decrease](#)

Forecast For Lat/Lon: 47.5780/-122.6600 (Elev. 26 ft)

Bremerton WA

Custom Weather Forecast Table

	Tue Nov 16					Wed Nov 17					Thu Nov 18					Fri Nov 19
Weather	Isolated Rain Showers					Chance Rain					Chance Rain Showers					Likely Rain Showers
Daily-Temp	High 51 Low 45					High 46 Low 42					High 46 Low 39					Low 34
Chance of Precip	25%	10%	5%	40%	80%	100%	100%	45%	40%	70%	70%	70%				
Precip	0.01"	0.00"	0.00"	0.03"	0.18"	0.37"	0.07"	0.02"	0.08"	0.06"	0.06"	0.04"				
12-hr Snow Total	0"					0"					0"					
3-Hour Temp	46	45	47	49	48	44	44	43	42	43	45	44	40	40	39	41
Temp	46	45	47	49	48	44	44	43	42	43	45	44	40	40	39	41
Cloudiness	75%	75%	57%	57%	77%	77%	100%	100%	100%	100%	100%	100%	93%	93%	100%	100%
Dewpoint	43	42	44	43	40	42	40	40	42	42	43	43	41	39	39	38
Relative Humidity	89%	90%	89%	80%	74%	93%	88%	88%	98%	99%	98%	93%	89%	94%	93%	92%
Wind	SW	SW	SW	NW	SW	SE	S	S	S	S	S	S	S	S	S	S
Snow Level (ft)	4340	4340	4038	4038	3544	3544	3647	3647	3328	3328	3758	3758	2284	2284	1383	1383

Forecast Weather Table Interface

Select Weather Format

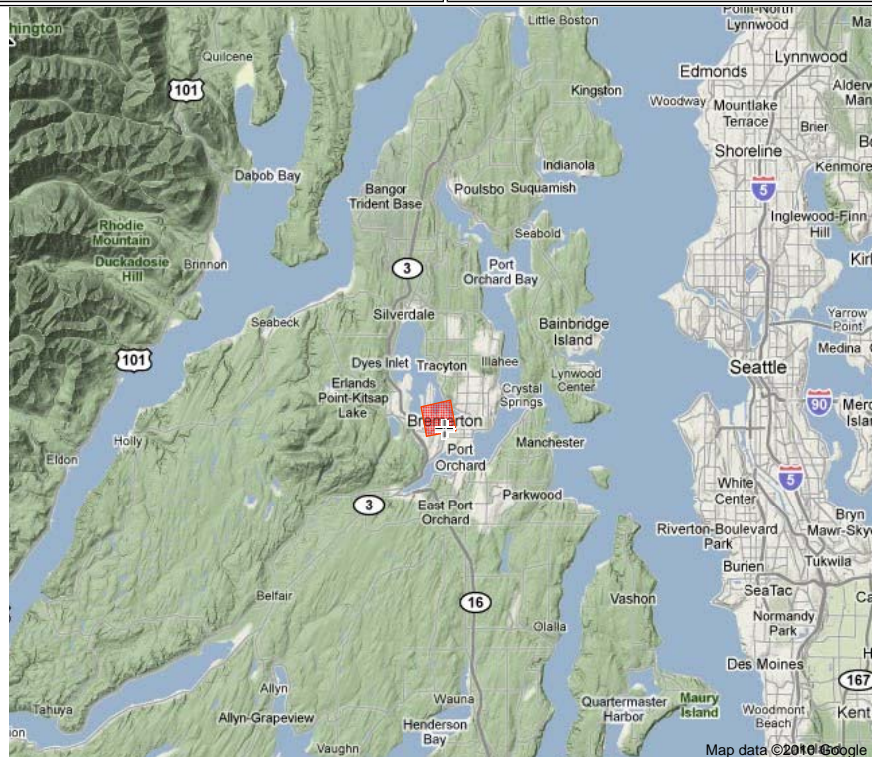
- ☒ Custom Weather Table
☐ XML
☐ Point Forecast Page
☐ Point Forecast Matrix
☐ Hourly Tabular Forecast
☐ Hourly Weather Graph

Interval in Hours: ☐ 1 ☒ 3 ☐ 6Duration in Days: ☐ 1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7[Reload Table](#)[Print Version](#)

Enter a Location or Click on Map Below

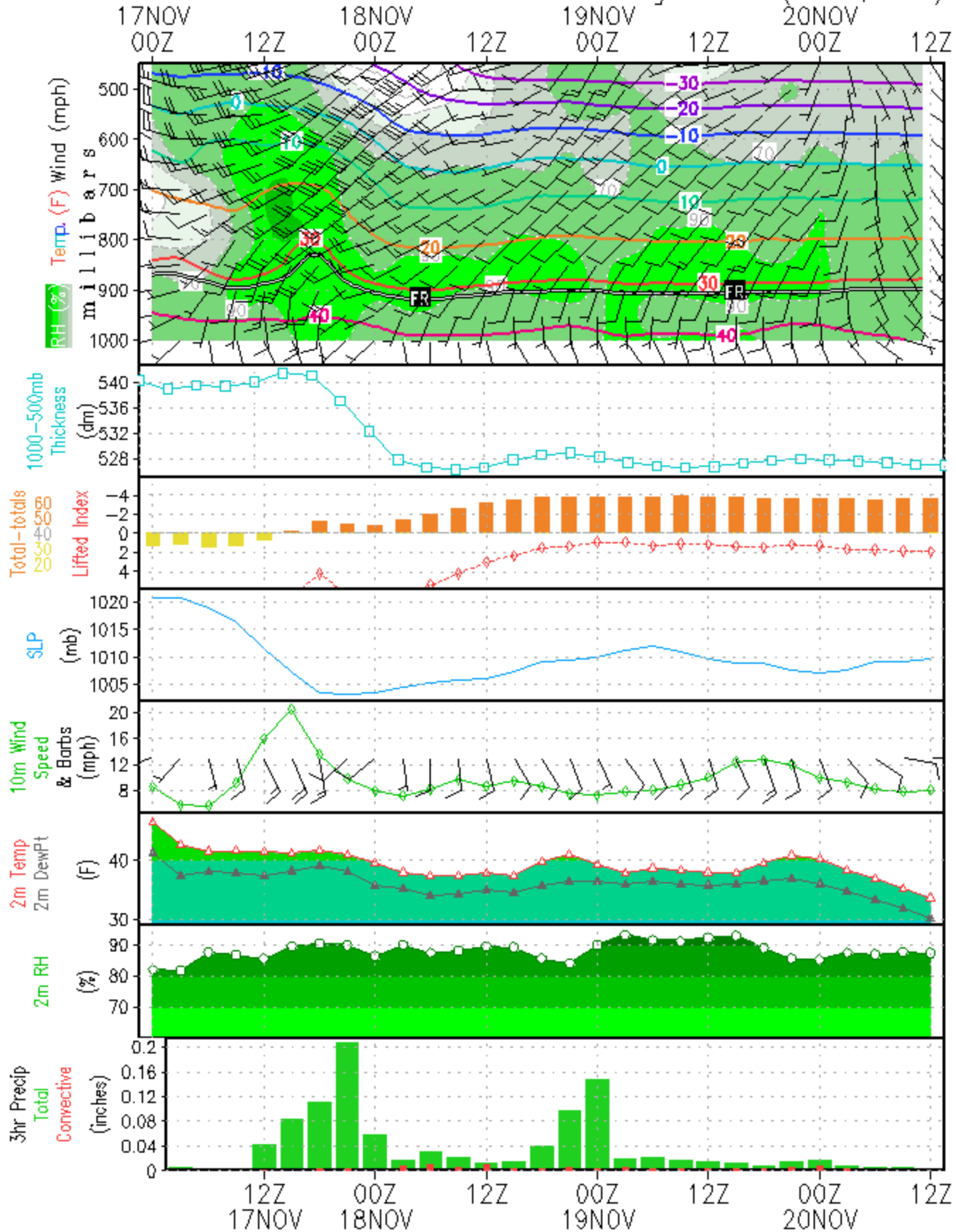
Search by address; city, state; latitude/longitude...

Go



Seattle

NAM 0-84hr Forecast Meteogram for (123W, 48N)





STORM EVENT REPORT #2

For

Non-Dry Dock Stormwater Monitoring

Conducted at

Puget Sound Naval Shipyard

Bremerton, WA

Project ENVVEST Study Area

November 29, 2010



Puget Sound Naval Shipyard and Surrounding Area

PNNL Contract No.: N4523A10MP00034 Amendment 1



1.0 Introduction

Taylor/TEC conducted non-dry dock stormwater sampling tasks within the Puget Sound Naval Shipyard (PSNS) – Project ENVVEST study area between November 22nd and December 1st, 2010. This was the second storm event (STE) of the 2010-2011 project sampling season. A summary of the events and conditions that occurred during STE#2 are presented in this report, with supporting information as attachments.

This STE Report contains: 1) a list of the Taylor/TEC and Navy staff that participated in the event and their base roles; 2) details regarding storm event preparatory tasks; 3) weather forecast information and targeting details; 4) a precipitation and event qualification summary; 5) a sampling information, management and validation discussion; 6) basin runoff calculations; 7) descriptive statistics and discussion of the event station monitoring data; 8) notable anomalies and variations to the PWP; and 9) action items.

Attachments containing weather forecast information, field sampling / sample processing forms, COC forms, station hydrographs and autosampler reports are also included in this report.

2.0 Project Staff Participating in the STE

Taylor/TEC Personnel:

Dave Metallo – Project Manager, Storm Controller, Field Event and QC Manager

Brian Rupert – Field Team Leader

Navy Personnel:

Bob Johnston – Technical Oversight

Jacquelyn Young – NPDES Manager, Grab Sample Collection Lead, Navy Event QC Manager

Teal Tomkins – Field Team Member

3.0 Storm Event Preparatory Tasks

After the completion of last STE all four of the current monitoring stations (PSNS 81.1, PSNS82.5, PSNS096 and PSNS126) were visited on November 22nd, 2010 and station reset tasks (see Section 1 of the attached *Stormwater Field Sampling Forms*) were conducted. Minor troubleshooting and level data collection issues, as previously noted in the STE#1 report, were corrected and/or deemed to be functioning properly during the week of the 22nd. Figure 1 shows the general location of the monitoring stations at the PSNS.

On November 29th, just prior to the onset an event forecasted for later that day (STE#2), the Taylor/TEC field team visited all four monitoring stations to conduct storm setup tasks as indicated in Section 2 of the *Stormwater Field Sampling Forms* (attached). At this point all stations were fully functional, operational and “sample ready”. All stations were set (in disabled mode) with pre-

determined autosampler enable and pacing conditions set “high” (to prevent premature enabling) as directed by the Taylor/TEC Storm Controller. Station operations were ready to be managed via telemetry by the Storm Controller.

4.0 Weather Forecast Information and STE Targeting Details

Since the conclusion of STE#1 there had been 0.74” of rain over the Shipyard (as measured by the PSNS gauge at B427) between November 18th (1100) and 29th (1800). A total of 0.34” of rain fell on the 26th (022-2100) with only an additional 0.02” until the start of STE#2 (approximately 1745 on the 29th).

On the 29th the forecast for the Bremerton area was again promising for a “sizeable” rain event. The routinely referenced weather models used to gain forecast information in the Pacific Northwest, the MM5-NAM (<http://www.atmos.washington.edu/mm5rt/rt/naminit.12km.html>) and the GFS-WRF (<http://www.atmos.washington.edu/mm5rt/rt/gfsinit.frame1.html>) (both hosted by the University of WA and initialized for the PNW) were in fairly good agreement with each other for this storm event.

Both models predicted rain to spread over the forecasted area by late afternoon to early evening and become heavy by late evening as “a strong frontal system brings rain, wind (with advisories in Puget Sound and Hood Canal) and heavy mountain snow this afternoon through Tuesday (Nov. 30th)”. The National Weather Service forecast synopsis predicted that a trough would linger over the region for the remainder of the week for a chance of showers.

The forecasted precipitation probability was between 89-92% for approximately 1.02” depth or greater event. The system setting up over the region would likely spread rain throughout the lowlands of the forecast area and develop into a snow event for elevations in excess of 2000’ rising to 5000’ as a warm front pushes into the area along southwesterly flows. The weather was forecasted to remain unsettled with periods of rain through Wednesday (December 1st). Detailed weather information is provided in the Attachment section of this report.

Once the field crew reported the completion of their site preparatory tasks on the 29th the Taylor/TEC Storm Controller took command of station operation via telemetry. With a check to ensure a qualifying antecedent dry period had been met, the enable condition switches at each monitoring station were turned on (sample ready mode). Table 1 lists the monitoring station enabling conditions that were used for STE#2.

As predicted, rain began to fall over the shipyard at approximately 1800 on November 29th. A check of the stations at 2030 revealed that PSNS81.1, PSNS82.5 and PSNS096 had all enabled between 1943 and 1950 hours. Another check at 2200 revealed that PSNS126 had enabled at 2140 hours. PSNS81.1, 82.5 and 096 all started sampling after approximately 0.07” of rain had fallen. PSNS126 started sampling after approximately 0.19” of rain had fallen. This is perhaps a consequence of the slope of the piping system at this location; not attaining a correlated level response as expected. This delayed response was noted during STE#1. Consequently the level

enable at this station was set lower (0.2 vs. 0.25) during this event. A check of the station piping water levels and hydrographs showed that all were elevated above base flow at the time each enabled.

Table 1. Monitoring Station Enabling Conditions

Station	Rainfall (in/hr)	Level (ft)	Conductivity (µS/cm)	Repeatable Enable (Y/N)	Pacing (min)	¹ Antecedent Period (24hr/6hr)
PSNS81.1	0.03	0.20	2000	N	15	0" / 0"
PSNS82.5	0.03	0.17	2000	N	15	0" / 0"
PSNS096	0.03	0.20	2000	N	15	0" / ² 0"
PSNS126	0.03	0.20	2000	N	15	0" / 0"

¹Antecedent condition as checked b/w 0730 and 1800 on 11/29/10

²PSNS096 rain gauge recorded 0.01" rain at 1105 on 11/29 – this is attributed to maintenance / setup activities

5.0 Precipitation and STE Qualification Summary

Precipitation Summary:

The previous rain event to cause runoff (≥ 0.03 " rainfall without 6-hr gap) prior to the onset of STE#2 ranged from 2:20:50(Days:Hours:Minutes) at PSNS82.5 to 2:23:25 at PSNS096, as measured by each stations rain gauge. Moderate to heavy rain fell over the shipyard from approximately 1800 on November 29th until approximately 0900 on the 30th. The rain during this period was steady. After 0900 on the 30th the rain became lighter (but still mostly steady) and finally tapered off around 1800. About 85% of the storm event rain totals occurred during the heavier rainfall period. The storm event duration was approximately 24 hours for all four stations. Table 2 summarizes the rainfall amounts that occurred during the sampling period for each monitoring station as well as the PSNS rain gauge at B427 and the overall storm event depths measured at each station. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), attached to this report, provides additional storm event and sampling period rainfall information.

Table 2. Rainfall Totals for PSNS Gauge and Monitoring Stations

Station	¹ Rainfall During Heavy Period (in)	% of STE Rainfall Occurring During Heavy Period	Sampling Period	Sampling Period Rainfall (in)	% Sampling Period vs. STE Period	Total Storm Event Rainfall (in)
B427	1.12	84	NA	NA	NA	1.32
PSNS81.1	0.92	88	11/29 (1947) – 11/30 (1931)	0.98	93	1.05
PSNS82.5	1.04	83	11/29 (1950) – 11/30 (1934)	1.17	94	1.25

Table 2. Rainfall Totals for PSNS Gauge and Monitoring Stations

Station	¹ Rainfall During Heavy Period (in)	% of STE Rainfall Occurring During Heavy Period	Sampling Period	Sampling Period Rainfall (in)	% Sampling Period vs. STE Period	Total Storm Event Rainfall (in)
PSNS096	0.99	84	11/29 (1943) – 11/30 (1927)	1.12	95	1.18
PSNS126	1.03	84	11/29 (2140) – 11/30 (2124)	1.05	85	1.23

STE Qualification Summary:

All storm qualification conditions were met for this event. Storm event qualification conditions included wet season event date range (Oct 1 – May 1), forecast probability ($\geq 70\%$), antecedent dry period (≤ 0.1 " rain in previous 24hrs and 0" rain in previous 6hrs), forecasted storm depth (≥ 0.1 "), storm duration (≥ 2 hrs) and runoff occurrence / hydrograph stage (elevated above base flow). Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), documents the particular STE qualification listed above.

6.0 Sampling Information, Management and Validation**Grab Sampling:**

All grab sample collection was conducted by the Navy Team, with storm control assistance (limited to station status checks via telemetry) from Taylor/TEC as necessary. Grab sampling was conducted at all four of the current monitoring stations. Grab samples were collected as per the 201-11 Project Work Plan (PWP). Water quality condition (conductivity) was assessed prior to the collection of the samples; water was sampled only if it was determined to be ≤ 2000 $\mu\text{S}/\text{cm}$. Samples were collected using manual methods; a laboratory cleaned stainless steel dip cup, lowered on an extension pole, used to fill the appropriate analytical containers. Parameters included total petroleum hydrocarbons (NW-TPH-Dx) and fecal coliform. All samples were collected on the November 30th between 0535 (PSNS096) and 0807 (PSNS126). Sample collection was coordinated with low or lower tidal conditions to ensure that proper conductivity conditions would exist. Grab sampling times are indicated on the attached hydrographs to illustrate the water level stage during collection. Grab sample IDs, along with the other pertinent information is list in the *Stormwater Field Sampling Forms* and in Table A-1 (both are attached). Table 3 summarizes these results.

Table 3. Grab Sampling Details

Sample Collection Criteria:	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Grab sample ID	SW02-0004	SW02-0001	SW02-0002	SW02-0003
Grab Date /Time	11/30/2010 8:07	11/30/2010 5:35	11/30/2010 7:30	11/30/2010 7:50
Grab sample conductivity value (μS/cm)	31	103	43	37
Hydrograph stage at grab collection	Elevated Flow	Intra-event trough	Elevated Flow	Rising limb
Grab parameters collected per PSNS PWP?	Yes	Yes	Yes	Yes

Composite Sampling:

Composite sample retrieval tasks and formulation procedures were managed by Taylor/TEC with support from Navy personnel as requested. Composite samples were collected from all four of the current monitoring stations.

Composite samples were collected via autosamplers which were operated and synchronized by a custom designed telemetered water quality control system. Methods used in preparation, retrieval and formulation of the composite samples were conducted as per the PWP. Discrete time-paced samples were collected in 1000-ml plastic wedge bottles (up to 24 bottles) at a rate of 240-ml / 15 minutes (four samples / bottle, one bottle / hour) per aliquot; which, at this pacing, provides for 24 hours of sampling coverage. Samplers at each station were enabled as per the conditions stated in Section 4 of this report. Each station was outfitted with either a pressure transducer (level and temperature) / conductivity (with salinity post-calculated) probe combo (INW CT2X) (PSNS081.1, PSNS096 and PSNS126) or a pressure transducer (level and temperature) (Campbell CS450) and a multi-parameter sonde (conductivity, salinity and temperature) (YSI6820) (PSNS82.5).

The discrete samples from each station were brought back the C106 Stormwater Lab at B147 for processing. Each individual discrete sample was screened with bench-top meters for its conductivity value. Bottles with values ≤ 2000 μS/cm were included in the overall composite sample; bottles testing greater than 2000 μS/cm were discarded. Composite formulation followed the procedures as detailed in Section 8.2.5 of the PWP. Based on this screening criterion all, only five discrete samples from PSNS096 qualified. However, this was a sufficient volume for full sample analysis. The other three stations had full coverage throughout the entire sampling period.

Composite samples parameters included: hardness, TOC, DOC, TSS, total and dissolved metals and turbidity. A small portion from each of the composite samples was poured off for the assessment of overall conductivity value. Results of the composite formulation, bench top testing results, as well as sample IDs, sample date/time and resultant overall conductivity values, are

detailed in the *Stormwater Field Sampling Forms* and in Table A-1 (both are attached). Table 4 summarizes these results.

Table 4. Composite sampling Details

Sample Collection Criteria:	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Composite sample ID	SW02-0005	SW02-0006	SW02-0007	SW02-0008
Composite Date /Time	11/30/2010 21:24	11/30/2010 19:27	11/30/2010 18:34	11/30/2010 19:31
Overall Composite conductivity value (μS/cm)	155	348	70	66
Composite volume (ml)	4800	4000	4025	4800
Composite parameters collected per PSNS PWP?	Yes	Yes	Yes	Yes

All sampling and vault monitoring equipment operated as designed and programmed. Details pertaining to autosampler programming and event-specific operation of each monitoring station sampler unit are contained in the attached *Sampler Reports*.

QC Samples:

No quality control samples were collected during STE#2. As previously mentioned in Section 3 of this report, field equipment blank samples were collected at each monitoring station prior to STE#1.

Sample Management:

All samples were handled and managed as per Section 9 of the PWP and in a manner acceptable and within industry standards regarding practices typical for tasks of this nature. Once collected, both grab and composite samples were placed into coolers and put on ice and/or into the Stormwater Laboratory refrigerator to maintain temperatures between 2 and 6 °C.

All sample IDs, collection date and time, matrix, requested parameter analysis and other associated information were documented on *Chain-of-Custody (CoC) forms* (attached). Samples were in direct control of project and/or laboratory personnel at all times. Samples were delivered to the testing facility, Battelle Marine Science Laboratory in Sequim, WA, in good, useable and properly chilled condition. Adequate sample volume was collected from the targeted stations to proceed with the scheduled analysis of all parameters per the 2010-11 PWP.

Sample Validation Summary:

All sample validation criteria were met for this event per Section 8.2.6 of the PWP. Prior to processing the samples and transferring custody to the analytical laboratory, the Taylor/TEC Field Event Lead validated the samples against certain criteria. These validation criteria included runoff occurrence / hydrograph stage, sample preparation and handling review, requested parameters, ≥2 hour sampling duration or 75% storm hydrograph coverage, minimum number of aliquots,

minimum sample volume collected for required parameters, discrete and composite samples conductivity measurement results, quality control sample collection and anomalous conditions assessment. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), documents the particular STE qualification listed above.

7.0 Basin Runoff Calculations

As described in Section 7.4 of the PWP, rainfall runoff volumes were calculated for each of the basins associated with the current monitoring stations. These calculations are based on the Runoff Coefficient Method. Table 5, below, summarizes the results from these calculations.

Table 5. Monitoring Station Runoff Volume Calculations

Station	Combined Drainage Area (Ft ²)	STE Rain Total (In)	STE Rain Total (Ft)	STE Runoff Vol. (Gal)	Sample Event Rain Total (In)	Sample Event Rain Total (Ft)	Sample Event Runoff Vol. (Gal)	% of Runoff Sampled During STE
PSNS126	591,881	1.23	0.1025	453,827	1.05	0.0875	387,413	85
PSNS096	635,317	1.18	0.0983	467,329	1.12	0.0933	443,567	95
PSNS082.5	82,764	1.25	0.1042	64,491	1.17	0.0975	60,364	94
PSNS081.1	849,074	1.05	0.0875	555,757	0.98	0.0817	518,707	93

8.0 Descriptive Statistics and Discussion of the Event Station Monitoring Data

Descriptive statistics for the sampling period at each monitoring station are provided in Table 6, below. These statistics include minimum, maximum, average and median for 5-minute interval rainfall data, vault level, conductivity, salinity, transducer water temperature, YSI water temperature (PSNS82.5 only) and tide stage. Sampling period rainfall totals, as well as maximum 1-hour intensity and average 1-hour intensity (includes intra-event dry periods) are included as part of each station's rainfall information.

Table 6. Sampling Period Rainfall and Vault Parameter Descriptive Statistics

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (μS/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
PSNS81.1 min	0			0.03	25	2.00	6.83		1.60
max	0.02			9.74	275	2.00	15.04		12.80
average	0.003			4.09	56	2.00	8.96		7.08
median	0			3.73	56	2.00	8.34		7.00

Table 6. Sampling Period Rainfall and Vault Parameter Descriptive Statistics

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (μ S/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
total	0.98	0.1	0.041						
PSNS82.5 min	0			0.18	27	0.02	4.72	4.80	1.60
max	0.02			3.88	900	0.72	6.72	6.79	12.80
average	0.004			0.85	61	0.05	5.43	5.51	7.03
median	0.000			0.35	45	0.03	5.25	5.33	6.90
total	1.17	0.12	0.049						
PSNS096 min	0			0.04	47	2.00	7.26		1.60
max	0.02			10.53	47,877	42.00	14.06		12.80
average	0.004			4.78	32,974	29.66	9.75		7.05
median	0.000			4.48	47,476	42.00	9.75		6.95
total	1.12	0.11	0.047						
PSNS126 min	0			0.04	22	2.00	6.26		1.60
max	0.02			5.00	728	2.00	9.82		12.80
average	0.004			1.01	151	2.00	7.91		6.84
median	0.000			0.20	118	2.00	7.75		6.90
total	1.05	0.12	0.044						

¹salinity calculation for PSNS81.1, 096 and 126 is based on an algorithm that has a lower range cut-off value of 2ppt. Actual field values may have been lower. PSNS096 used a conductivity probe (YSI6820) that utilized a different salinity algorithm function and thus is able to calculate lower low range salinity values.

All four station hydrographs (see attached) showed continuous rain throughout both the sampling and storm periods; moderate to heavy between 1800 on November 29th through approximately 0300 on the 30th, then turning heavy until about 0900, then tapering light rain until storm end at 1800. The level response at each station varied; PSNS81.1 showed an initial level response appropriate for the amount of runoff, then, although remaining clearly freshwater as evidenced by the low conductivity and colder rainwater temperature values, discharge of the runoff in the pipe was controlled by the tide cycle – causing a pipe storage effect. This type of hydrograph response was also noted in PSNS096 and PSNS126 as well, although at 096 the effective tide level (~2.5') (the elevation at which the tides needs to be to impact the sampling line intake during non-rain periods) is so low that even 1+” of rain is nearly incapable of overcoming the tidal effect at any periods other than daily lows. At PSNS126 the pipe slope combined with its effective height (~8.5') causes very little stage response through most of the storm event, again until the tide level overcomes the stations effective level – at which time a pipe storage effect is evident. PSNS82.5

is perhaps the most interesting of the current stations. Given its effective tide level of 10+' coupled with a Tideflex® valve at the terminus of its outlet pipe in the next downstream vault (over 50' away) and a small basin area (approximately 2 acres) its level response is slight (approximately 4" average) throughout the majority of the storm event. Only when the tide level became greater than 9' did the station hydrograph show any increased response. The resultant hydrograph is a sharp-sided asymmetrical peak that clearly illustrates the pipe storage and its quick release from both the receding tide and the release of the Tideflex® valve.

All of the grab samples were collected during slack tide periods except for PSNS081.1, which was collected during the rising limb of the higher high tide stage. However, all of the grab samples were collected when freshwater runoff conditions (as evidenced by low conductivity/salinity and temperature values [as compared to warmer seawater values]) occurred. Sample marker and grab sampling indications have been applied to the hydrographs (see attached).

Telemetry System Metadata:

All of the monitoring stations were operating without incident by the start of STE#2. None of the stations, except PSNS096, had any notable issues. An excerpt from the PSNS096 metadata file (separate submission) is provided below:

16-18 Nov, 22-26 Nov, 15-16 Dec and 10 Jan various times - Salinity recorded as "not a number" (dropped out). Salinity data experience various bouts of "drop-out" during the dates indicated above. The causes for this were either negative conductivity values used for salinity calculation, maintenance periods or for a few instances were unexplainable. However, during all of these salinity problem periods conductivity functioned (properly).

9.0 Notable Anomalies and Variations to the PWP

There were no anomalies observed that would have otherwise caused any of the STE#2 samples to be non-representative of the conditions from which they were collected. As reported above, all intended and scheduled grab and composite samples were submitted to the MSL within holding times and without incident. All support and sampling tasks, as well as collected samples, were managed as appropriate per the PWP.

10.0 Action Items

Routine action items include resetting (reloading with bottles, charging batteries, back flushing with DI water, etc.) all four monitoring stations and re-stocking of sampling supplies. Routine station maintenance items (e.g. sensor cleaning and calibration, rain gauge maintenance, etc.) as well as storm set-up tasks will need to be completed as necessary. Non-routine action items include the re-installation of the Navy's transducer at PSNS096 once received back from the manufacturer. The current focus of the field efforts will be in maintaining proper station and equipment operational status, data and resource management and storm-tracking tasks.



Figure 1. Stormwater Monitoring Locations within the Shipyard Boundary

ATTACHMENTS

- Storm Qualification and Sample Validation Information Checklist
- Stormwater Field Sampling Forms and Controller Notes
- Chain-of-Custody Forms
- Runoff Calculation Worksheet
- Station Hydrographs
- Autosampler Reports
- Weather Forecast Information

Table A-1. PSNS Non-Dry Dock Stormwater Monitoring Tasks
Storm and Sample Information and Validation Checklist
Stormwater Sampling Event #2 (11/29/2010)



This form acknowledges representativeness criteria described in the project PWP.
 Mark with "Yes" to acknowledge acceptable, "No" for not acceptable, "NA" or "-" if not applicable.

1 Storm Event Data:				
Project Storm Event (STE) #	2			
Event Forecast Probability (%)	92			
PSNS C106 Rain Gauge - Storm Event Total (in.)	1.32			
Rainfall and Runoff Summary:				
Last Runoff (≥ 0.03 " rainfall without 6-hr gap) Prior to STE Start (days:hrs:min)	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Antecedent Dry Period (days: hrs: mins)	2:23:10	2:23:25	2:20:50	2:20:55
Rainfall Prior 24-hrs to Sampling Start	0.00	0.00	0.00	0.00
Rainfall Prior 6-hrs to Sampling Start	0.00	0.00	0.00	0.00
STE Start Date & Time	11/29/10 17:10	11/29/10 17:40	11/29/10 17:30	11/25/10 17:30
STE Duration (hrs:mins)	24:35	24:0	24:0	23:45
STE End Date & Time	11/30/10 17:45	11/30/10 17:40	11/30/10 17:30	11/30/10 17:15
Period Between Next Measureable Rain (days:hrs: mins)	4:20:25	4:20:0	4:20:30	4:20:30
Storm Event Total Rainfall (in)	1.23	1.18	1.25	1.05
Storm Event Max 1-hr Rainfall Intensity (in/hr)	0.12	0.11	0.13	0.1
Storm Event Average 1-hr Rainfall Intensity (in/hr)	0.050	0.049	0.052	0.044
Sampling Period Total Rainfall (in)	1.05	1.12	1.17	0.98
Sampling Period Max 1-hr Rainfall Intensity (in/hr)	0.12	0.11	0.12	0.1
Sampling Period Average 1-hr Rainfall Intensity (in/hr)	0.044	0.047	0.049	0.041
Runoff volume calculated for entire storm period (gallons)	453,826.65	467,329.25	64,491.42	555,757.49
Runoff volume calculated for sampling period (gallons)	387,412.99	443,566.75	60,363.97	518,706.99
Percentage of total storm runoff utilized during sampling period	85%	95%	94%	93%
1 Sample Collection Criteria:				
Grab sample ID	SW02-0004	SW02-0001	SW02-0002	SW02-0003
Grab Date /Time	11/30/2010 8:07	11/30/2010 5:35	11/30/2010 7:30	11/30/2010 7:50
Grab sample conductivity value ($\mu\text{S}/\text{cm}$)	31	103	43	37
Hydrograph stage at grab collection	Elevated Flow	Intra-event trough	Elevated Flow	Rising limb
Grab parameters collected per PSNS PWP ?	Yes	Yes	Yes	Yes
Composite sample ID	SW02-0005	SW02-0006	SW02-0007	SW02-0008
Composite Date /Time	11/30/2010 21:24	11/30/2010 19:27	11/30/2010 18:34	11/30/2010 19:31
Overall Composite conductivity value ($\mu\text{S}/\text{cm}$)	155	348	70	66
Composite volume (ml)	4800	4000	4025	4800
Composite parameters collected per PSNS PWP ?	Yes	Yes	Yes	Yes
1 QC Sample Summary Information:				
Grab sample duplicate ID	N/A	N/A	N/A	N/A
Grab sample duplicate date and time	N/A	N/A	N/A	N/A
Grab sample duplicate conductivity value ($\mu\text{S}/\text{cm}$)	N/A	N/A	N/A	N/A
Composite sample duplicate ID	N/A	N/A	N/A	N/A
Composite sample duplicate date and time	N/A	N/A	N/A	N/A
Was additional volume collected for MS/MSD analysis (grab, comp or both) ?	N/A	N/A	N/A	N/A
Overall Composite Duplicate conductivity value ($\mu\text{S}/\text{cm}$)	N/A	N/A	N/A	N/A
Composite Duplicate volume (ml)	N/A	N/A	N/A	N/A
1 Storm and Sample Validation:				
Was the targeted STE antecedent qualified per PSNS PWP? (if no, then see next line)	Yes	Yes	Yes	Yes
Was the antecedent overage amount greater than 10% of the total rain event ?	N/A	N/A	N/A	N/A
Was runoff occurring OR was the hydrograph at least 10% above background pipe level during grab collection ? If no, explain in summary narrative.	Yes	Yes	Yes	Yes
Were a minimum of 8 aliquots collected OR does the composite sample represent at least 75% of the stations storm event rain volume ?	Yes	Yes	Yes	Yes
Were all 1-hr sampler bottles used for the Composite sample $\leq 2000 \mu\text{S}/\text{cm}$?	Yes	Yes	Yes	Yes
Did any anomalous conditions exist that could make samples non-representative? Explain if "Yes"	No	No	No	No
Based on consideration of the information above, was the sample collected during the STE valid for project purposes ? (Y / N, composite, grab or both)	Yes-both	Yes-both	Yes-both	Yes-both

1 If the answer to any of these questions is "No" OR indicate non-representative conditions, then these items should be explained in the Event Narrative.

Validation Check List Completed By / Date: Pete Heltzel Received By / Date: [Signature] 1/14/11

Interim Field
Form

Station: 81.1

STE #2

Batts: Logger 12.82
Sampler 12.4365

Lvl 6.21 $13.86 - 6.21 = 7.65'$

Rec. 7.82 diff = 0.17

New offset = -0.11'

Desiccant: Good (box & trans)

Lids: off

Pump Head Tubing Replaced: Yes

Backflush: Yes

Suction Line connected: Yes

Prgm Reviewed: Yes

All cables: Good

Cond.: ~~Re~~ Meas 43,900 Read. = 46,465 → too high of range to cal.

Enable settings: $R = 0.03"/hr$ $L = .2'$, $C = 2,000 \mu s$

Prgm Disabled: 12:48 29 Nov 2010

Note: Lip. Dect. is "ON"

J. Young / B. Rupert, Rain, 11/30/10 0745 - arrived

Bottle B (1 of 4)

- TPH, FC

SW02-0003 @ 11/30/10 0750

conductivity - (451 meter) $37 \mu s$

equipment Running correctly - Yes

81.1

Comp begin = 29 Nov 10 (1947)

end = 30 Nov 10 (1931)

Missed aliquots = 23 4/4, ~~14~~ 1+2 24, 4 24

Last aliquot = 4/4 24 (1931) Last sample collected 3/4 24 (1916) 11-30-10

Cond. Testing: (BTL #/Cond. reading $\mu\text{S}/\text{cm}$ /used for comp Y/N)

1 167-Y	7 73-Y	13 36-Y	19 50-Y
2 94-Y	8 73-Y	14 35-Y	20 70-Y
3 79-Y	9 54-Y	15 35-Y	21 69-Y
4 72-Y	10 50-Y	16 35-Y	22 85-Y
5 68-Y	11 47.3-Y	17 40-Y	23 91-Y
6 72-Y	12 43-Y	18 39-Y	24 110-Y

BTLs used: All 24

Overall Comp Info (cond reading, vol., analysis)

Total vol. = 4,800 ml, Overall Cond. Meas. = 66 $\mu\text{S}/\text{cm}$, analysis per FSP

Comp Sample ID / Time

SW02-0008 (1931) 11-30-10



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: 82.5	MH/CB#: CBS-6	Loc. Descrip: RMTS	Page: 1 of 2
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pages per station

Section 1: Station Reset and Inspection			
Personnel: B. Rupert / J. Young		Weather: Snowing	
Arrival Date/Time: 11/22/10 1300			
Carry-over maintenance to do prior to set-up: NA			done?
Sampler Battery Voltage	12.54	Changed? <input checked="" type="checkbox"/> N	New voltage 12.54
Modem Battery Voltage	12.46 V	Changed? <input checked="" type="checkbox"/> N	New voltage
Sample Tubing & Strainer OK?	no visual	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	Yes
Transds. Cable OK?	Yes	Internal Sampler Tubing OK?	Yes
Transds. Desiccant OK (Yes/No)	Yes	Tubing Replaced? (Yes/No)	No
Telem. Box Desiccant OK (Yes/No)	Yes	Normal Smpler Program or Dup. ?	Normal
Modem Status	Good	Bottles Loaded ?	Yes
Notes (including channel condition): * Sampler: Change internal battery ASAP		Lid Status?	On
		Backflushed with DI?	Yes
		Suction line & quick connect attached?	Yes
		Last Status (on/off) last screen...	OFF

Section 2: Storm Setup and Inspection			
Personnel: DM / BR		Weather: Overcast, 30°-40° F, lts breeze	
Arrival Date/Time: 11-29-10 (1125)			
Sampler Battery Voltage	12.51	Changed? <input checked="" type="checkbox"/> N	New voltage =
Modem Battery Voltage	12.63	Changed? <input checked="" type="checkbox"/> N	New voltage =
Sample Tubing & Strainer OK?	Yes	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	Yes
Transducer Cable OK?	Yes	Aliquot Vol. Cal'ed (Y/N & vol.)	No
Multi-meter Cable OK	Yes	Program Reviewed (Yes/No), Dup ?	Yes
Recorded Level (FT)	8.04	Lids off bottles?	Yes
Measured Level (FT)	8.04	Diagnostics/Distributor arm check?	Yes
Offset Diff (FT)	0.00	Backflush with DI?	11-22-10
Level Adjusted ?	NO	Last screen...	Prgrm Disabled 11:58 29 Nov 10
Cond. Sonde Type (YSI6820 or INW-CT2X)	6820	Ice Deployed?	No, cold out!
Cond. Sonde Cal. Info. : Recorded Val. = 35200 Meas. Val. = 35500 Diff. = 300 (>10% adj. offset); Offset = <input checked="" type="checkbox"/> New Rec Val = NA			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) R=0.03"/hr, L=0.17', Cond=2.000 uS Storm Reset = Yes			

Section 3: Grab Sample Collection			
Personnel: JY / BR		Weather: Rain	
Arrival Date/Time: 11/30/10 0725			
On Composite... (Bottle #/ Aliq #)	13 (1 of 4)	Composite Begin Time (date / time)	11-29-10 (1950)
Grab Parameters Collected	TPH, FC		
Grab Sample ID	SW02-0002	Conductivity Reading (what meter?)	42 uS (YSI)
Grab Date/Time	11/30/10 0730	Grab MS/MSD Collected ?	NA
Grab Dup ID	NA	Equipment running correctly?	Yes
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	OK
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which? Good			
Storm Contoller notified (Y or N/A)?	NA	Ice OK?	No
Notes: 5°C			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: 82-5 continued from previous pagePage: 2 of 2

Section 4: Post-Storm Sample Collection (for grab, comp or both)			
Personnel: <u>DM/BR/TT</u>	Weather: <u>Partly Sunny, 30-40°</u>	Arrival Date/Time: <u>12/1/10 (0830)</u>	
Sampler Battery Voltage	<u>10 12 range</u>	Changed? Y N <u>pulled</u>	New voltage <u>—</u>
Telemetry Battery Voltage	<u>OK</u>	Changed? Y <u>(N)</u>	New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>11-29-10 1950</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>11-30-10 1934</u>	<u>Last aliq. collected = 3/4 22 (1719) 11-30-10</u>	
Total Composite Sample Volume Collected	<u>24 1-L btls minus missed aliquots</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>2/4 20 → 1/4 22, 4/4 22 → 4/4 24</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>From surface - OK</u>			
Storm Contoller notified (Y or <u>(N/A)</u>):	Which parameter?:	<u>NA</u>	
Notes: <u>DL'ed w/ RTD</u>			
Maintenance Needed: <u>typical re-set tasks</u>			

Section 5: Compositing Scheme and QC Sampling	
Personnel: <u>DM/BR/TT</u>	Date/Time: <u>12-1-10</u>
Conductivity Meter Info. (Manuf., Model, Serial#, Cal.info.) <u>YSI 30 SN 98D0994 AB ENV#027</u>	
Conductivity Testing (List individual sampler bottle and reading): <u>BTL # / Cond. Reading μS/cm / add to comp Y/N</u>	
<u>1 163-Y</u>	<u>7 52-Y</u>
<u>2 99-Y</u>	<u>8 53-Y</u>
<u>3 74-Y</u>	<u>9 330-Y</u>
<u>4 66-Y</u>	<u>10 52-Y</u>
<u>5 57-Y</u>	<u>11 41-Y</u>
<u>6 53-Y</u>	<u>12 41-Y</u>
<u>13 37-Y</u>	<u>14 34-Y</u>
<u>15 35-Y</u>	<u>16 39-Y</u>
<u>17 39-Y</u>	<u>18 47-Y</u>
<u>19 49-Y</u>	<u>20 58-Y</u>
<u>21 60-Y</u>	<u>22 56-Y</u>
<u>23 59-Y</u>	<u>24 Insuf. vol.</u>
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Used all btls except #24 (all 4 aliquots reported as NLD), only ~75 ml in bottle - not used</u>	
Overall Composite Info. (include conductivity measurement, volume and requested analysis) <u>Overall Cond. = 70 μS/cm Tot. Comp. Vol. = 4025 ml, per FSP</u>	
Composite Sample ID & Time: <u>SW02-0007 (1834) 11-30-10</u>	
Field Blank Collected? (date/time)	<u>NO</u>
Blank ID:	<u>NA</u>
Duplicate comp sample? Yes/No	<u>NO</u>
Duplicate sample ID	<u>NA</u>

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: 096	MH/CB#: 3878	Loc. Descrip. By Life Station 5	Page: 1 of 2
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Section 1: Station Reset and Inspection			
Personnel: B. Rupert / J. Young		Weather: Snow	
Carry-over maintenance to do prior to set-up: N/A		Arrival Date/Time: 11/22/10 11:55	
Sampler Battery Voltage		Changed? (Y) N	New voltage 12.5+V
Modem Battery Voltage 12.63V		Changed? (Y) N	New voltage 12.5+V
Sample Tubing & Strainer OK? Y		Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No) Yes	
Transds. Cable OK? Y		Internal Sampler Tubing OK? Yes	
Transds. Desiccant OK (Yes/No) Y		Tubing Replaced? (Yes/No) NO	
Telem. Box Desiccant OK (Yes/No) Y		Normal Smler Program or Dup. ? Normal	
Modem Status Good		Bottles Loaded ? Yes	
Notes (including channel condition):		Lid Status? on	
		Backflushed with DI? Yes	
		Suction line & quick connect attached? Yes	
		Last Status (on/off) last screen... OFF	

Section 2: Storm Setup and Inspection			
Personnel: B. Rupert / J. Young		Weather: Snow	
Sampler Battery Voltage		Arrival Date/Time: 11/22/10 11:55	
Modem Battery Voltage		Changed? Y (N) Current	New voltage 12.92
Sample Tubing & Strainer OK? Yes		Changed? Y (N) Current	New voltage 12.63
Transducer & Multi-meter Setup		Sampler Setup	
Transducer Cable OK? Yes		Time/Date Display OK? (Yes/No) Yes	
Multi-meter Cable OK Yes		Aliquot Vol. Cal'ed (Y/N & vol.) Yes & 240mL	
Recorded Level (FT) 3.86 9.85		Program Reviewed (Yes/No), Dup ? Yes	
Measured Level (FT) 8.75 - 14.52 9.75		Lids off bottles? Yes	
Offset Diff (FT) 0.80 11.29 (-0.1)		Diagnostics/Distributor arm check? Yes	
Level Adjusted ? Yes Yes		Backflush with DI? Yes	
Cond. Sonde Type (YSI6820 or INW-CT2X) CT2X		Last screen... Prgrm Disabled 10:57 29 Nov 2010	
Cond. Sonde Cal. Info. : Recorded Val. =		Ice Deployed? No - cold out!	
Meas. Val. =		New Rec Val = (1)	
Diff. =		(>10% adj. offset); Offset =	
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) R = 0.03"/hr, L = 0.2', Cond = 2000 us			
(1) No cal., current cond. too high to cal. for 2000 us Storm Reset = Yes			

Section 3: Grab Sample Collection			
Personnel: JY/BR		Weather: Rain	
On Composite... (Bottle #/ Aliq #) 11 (10/4)		Arrival Date/Time: 11/30/05 0525	
Grab Parameters Collected TPH, PC		Composite Begin Time (date / time) 11-29-10 (1943)	
Grab Sample ID SW02-0001		Conductivity Reading (what meter?) 103 us (YSI)	
Grab Date/Time 11/30/10 0535		Grab MS/MSD Collected ? NO	
Grab Dup ID NA		Equipment running correctly? Yes	
Grab Dup Date/Time NA		Sampler Battery Voltage (Changed?): OK	
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?:			
Storm Contoller notified (Y or N/A):		Ice OK? NA	
Notes: flowing very well			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: 096 continued from previous pagePage: 2 of 2

Section 4: Post-Storm Sample Collection (for grab, comp or both)			
Personnel:	<u>DM/BR/TT</u>	Weather:	<u>Partly Sunny, 30-40°</u>
Sampler Battery Voltage	<u>10 12's</u>	Changed? Y N	<u>pulled</u>
Telemetry Battery Voltage	<u>Mid 12's</u>	Changed? Y N	<u>NA</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>11-29-10 (1943)</u>	Sampler Report Downloaded ?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>11-30-10 (1927)</u>		
Total Composite Sample Volume Collected	<u>24 1-L BTLs</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>None</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>Good, from surface</u>			
Storm Contoller notified (Y or N/A)?	Which parameter?: <u>NA</u>		
Notes: <u>DL'ed w/ RTD</u>			
Maintenance Needed: <u>Typical re-sets & change CTIX trans. back to orig. from loaner unit</u>			

Section 5: Compositing Scheme and QC Sampling			
Personnel:	<u>DM/BR/TT</u>	Date/Time:	<u>12-1-10</u>
Conductivity Meter Info. (Manuf., Model, Serial#, Cal. info.) <u>YSI 30 SN98D0994AB ENV # 027</u>			
Conductivity Testing (List individual sampler bottle and reading): <u>BTL #, Cond reading μS/cm, used in comp Y/N</u>			
<u>1 23,300 - N</u>	<u>7 44,500 - N</u>	<u>13 83 - Y</u>	<u>19 44,450 - N</u>
<u>2 44,360 - N</u>	<u>8 44,430 - N</u>	<u>14 33,130 - N</u>	<u>20 44,150 - N</u>
<u>3 44,270 - N</u>	<u>9 14,520 - N</u>	<u>15 44,170 - N</u>	<u>21 43,950 - N</u>
<u>4 44,100 - N</u>	<u>10 468 - Y</u>	<u>16 44,620 - N</u>	<u>22 43,500 - N</u>
<u>5 43,800 - N</u>	<u>11 130 - Y</u>	<u>17 44,000 - N</u>	<u>23 12,250 - N</u>
<u>6 43,700 - N</u>	<u>12 120 - Y</u>	<u>18 43,800 - N</u>	<u>24 1235 - Y</u>
Brief Description of Compositing Scheme: (Include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Used BTL's 10-13 & #24</u>			
Overall Composite Info. (include conductivity measurement, volume and requested analysis) <u>Cond. = 348 μS/cm, Vol. = 4000 ml, analysis per FSP</u>			
Composite Sample ID & Time: <u>SW02-0006 (1927) 11-30-10</u>			
Field Blank Collected? (date/time)	<u>No</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>No</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: <u>126</u>	MH/CB#: <u>5110</u>	Loc. Descrip. <u>Behind Bldg 460</u>	Page: <u>1</u> of <u>2</u>
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pages per station

Section 1: Station Reset and Inspection			
Personnel: <u>B. Rupert, J. Young</u>		Weather: <u>Snow</u>	
		Arrival Date/Time: <u>11/22/10 1100</u>	
Carry-over maintenance to do prior to set-up: <u>NA</u>			done?
Sampler Battery Voltage	<u>11.74 V</u>	Changed? <u>(Y)</u> N	New voltage <u>12.5V+</u>
Modem Battery Voltage	<u>12.50V 11.74V</u>	Changed? <u>(Y)</u> N	New voltage <u>12.50V</u>
Sample Tubing & Strainer OK?	<u>Yes</u>	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	
		<u>Yes</u>	
Transds. Cable OK?	<u>OK</u>	Internal Sampler Tubing OK?	
		<u>Yes</u>	
Transds. Desiccant OK (Yes/No)	<u>Yes</u>	Tubing Replaced? (Yes/No)	
		<u>N</u>	
Telem. Box Desiccant OK (Yes/No)	<u>Yes</u>	Normal Smpler Program or Dup. ?	
		<u>+ Normal</u>	
Modem Status	<u>good</u>	Bottles Loaded ?	
		<u>Y</u>	
Notes (including channel condition): <u>Channel clear of debris</u>		Lid Status?	
		<u>on</u>	
		Backflushed with DI?	
		<u>Yes 11-29-10</u>	
		Suction line & quick connect attached?	
		<u>Yes</u>	
		Last Status (on/off) last screen...	
		<u>OFF on 11-22</u>	

Section 2: Storm Setup and Inspection			
Personnel: <u>B. Rupert & J. Young</u>		Weather: <u>Snow</u>	
		Arrival Date/Time: <u>11/22/10 1100</u>	
Sampler Battery Voltage	<u>12.5V (see above)</u>	Changed? <u>Y</u> <u>(N)</u>	New voltage <u>12.33</u>
Modem Battery Voltage	<u>12.50V (see above)</u>	Changed? <u>Y</u> <u>(N)</u>	New voltage <u>12.82</u>
Sample Tubing & Strainer OK?	<u>OK</u>	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	
		<u>Yes</u>	
Transducer Cable OK?	<u>Yes</u>	Aliquot Vol. Cal'ed (Y/N & vol.)	
		<u>Yes 240 ml</u>	
Multi-meter Cable OK	<u>NA</u>	Program Reviewed (Yes/No), Dup ?	
		<u>Yes</u>	
Recorded Level (FT)	<u>3.79</u>	Lids off bottles?	
		<u>Yes</u>	
Measured Level (FT)	<u>3.76</u>	Diagnostics/Distributor arm check?	
		<u>Yes</u>	
Offset Diff (FT)	<u>-0.03</u>	Backflush with DI?	
		<u>Yes</u>	
Level Adjusted ?	<u>Yes</u>	Last screen...	
		<u>Prgrm Disabled 10:24 Mon 29 Nov</u>	
Cond. Sonde Type (YSI6820 or INW-CT2X)	<u>CT2X</u>	Ice Deployed?	
		<u>No - cold out!</u>	
Cond. Sonde Cal. Info. : Recorded Val. = Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val = <u>NOT Cal'ed</u>			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) → <u>R = 0.03"/hr, L = 0.20', C = 2000us</u>			
<u>① Cond. range currently too high to cal. for 2000us</u> <u>Storm Reset = Yes</u>			

Section 3: Grab Sample Collection			
Personnel: <u>JY/BR</u>		Weather: <u>Rain</u>	
		Arrival Date/Time: <u>11/30/10 0802</u>	
On Composite... (Bottle #/ Aliq #)	<u>11 (3 of 4)</u>	Composite Begin Time (date / time)	
		<u>11-29-10 (2140)</u>	
Grab Parameters Collected	<u>TPH, FC</u>		
Grab Sample ID	<u>SW02-0004</u>	Conductivity Reading (what meter?)	
		<u>YSI - 31us</u>	
Grab Date/Time	<u>11/30/10</u>	Grab MS/MSD Collected ?	
		<u>NA</u>	
Grab Dup ID	<u>NA</u>	Equipment running correctly?	
		<u>Yes</u>	
Grab Dup Date/Time	<u>NA</u>	Sampler Battery Voltage (Changed?):	
		<u>Good</u>	
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which? <u>OK</u>			
Storm Controller notified (Y or N/A)?:		Ice OK?	
<u>NA</u>		<u>NA</u>	
Notes:			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: 126 continued from previous pagePage: 2 of 2

Section 4: Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM/BR/TT</u>	Weather: <u>Partly Sunny 30-40</u>	Arrival Date/Time: <u>12-1-10 (0930)</u>	
Sampler Battery Voltage	<u>Lo 12's</u>	Changed? <input checked="" type="radio"/> N <u>pulled</u>	New voltage <u>—</u>
Telemetry Battery Voltage	<u>mid 12's</u>	Changed? <input checked="" type="radio"/> Y <input checked="" type="radio"/> N	New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>11-29-10 (2140)</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>11-30-10 (2124) 4/4 24</u>		
Total Composite Sample Volume Collected	<u>24- 1L BTLS</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>NONE</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>Good, from surface</u>			
Storm Contoller notified (Y or N/A)?	Which parameter?:	<u>NA</u>	
Notes: <u>DL'ed w/ RTD unit</u>			
Maintenance Needed: <u>typical re-set tasks</u>			

Section 5: Compositing Scheme and QC Sampling

Personnel: <u>DM/BR/TT</u>	Date/Time: <u>12-1-10</u>		
Conductivity Meter Info. (Manuf., Model, Serial#, Cal. info.) <u>YSI 30 SW: 98D0994AB YS^{DM} ENV#027</u>			
Conductivity Testing (List individual sampler bottle and reading): <u>BTL # / Cond reading μS/cm / used in Comp Y/N</u>			
<u>1 93-Y</u>	<u>7 56-Y</u>	<u>13 330-Y</u>	<u>19 273-Y</u>
<u>2 81-Y</u>	<u>8 48-Y</u>	<u>14 209-Y</u>	<u>20 220-Y</u>
<u>3 79-Y</u>	<u>9 42-Y</u>	<u>15 134-Y</u>	<u>21 213-Y</u>
<u>4 96-Y</u>	<u>10 59-Y</u>	<u>16 52-Y</u>	<u>22 249-Y</u>
<u>5 96-Y</u>	<u>11 33-Y</u>	<u>17 366-Y</u>	<u>23 255-Y</u>
<u>6 67-Y</u>	<u>12 177-Y</u>	<u>18 297-Y</u>	<u>24 255-Y</u>
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, were used for the overall composite sample) <u>All 24 btl's</u>			
Overall Composite Info. (include conductivity measurement, volume and requested analysis) <u>Overall comp. info. = 155 μS/cm, 4800 ml, all analysis per FSP</u>			
Composite Sample ID & Time: <u>SW02-0005 (2124) 11-30-10</u>			
Field Blank Collected? (date/time)	<u>NA</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NA</u>		
Duplicate sample ID:	<u>NA</u>		

NOTES:

Date: 11/30/10

Page: 1 of 1

Project No.: N4523A10MP00034 Amend.1

Project: PSNSNon-dry Dock SW 2010

Marine Sciences Laboratory

1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

				Analyze parameters per QAP/FSP										Phone: (360) 681-4564			
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	TPH	Turbidity				No. containers	Sample Type (Grab vs. Comp)	Storm#	Notes
SW02-0001	096	11/30/10 0535	SW						X					1	Grab	SW02	
SW02-0002	82.5	11/30/10 0730	SW						X					1	↓	↓	
SW02-0003	81.1	11/30/10 0750	SW						X					1	↓	↓	
SW02-0004	126	11/30/10 0807	SW						X					1	↓	↓	
SW02-0005	PSNS 124	11-30-10 (2124)	SW	X	X	X	X	X		X				1	Comp	SW02	
SW02-0006	PSNS 096	11-30-10 (1927)	SW	X	X	X	X	X		X				1	↓	↓	
SW02-0007	PSNS 082.5	11-30-10 (1834)	SW	X	X	X	X	X		X				1	↓	↓	
SW02-0008	PSNS 081.1	11-30-10 (1931)	SW	X	X	X	X	X		X				1	↓	↓	
SW0005	NA NA	12-1-10 (1220)	DI						X					1	Grab	SW02	Grab gear EB

Relinquished by: Dave Metello 12-1-10 1300
Signature Date Time
Dave Metello Taylor/TEC
Printed Name Company

Received by: Brian Rupert 12-1-10 1300
Signature Printed Name

Total # of Containers:
Shipment Method:

Relinquished by: Brian Rupert 12-1-10 1432
Signature Date Time
Brian Rupert TEC FNL
Printed Name Company

Received by: Jim Brandenberger 12/1/10 1432
Signature Printed Name

Sample Disposition:
Distribution:
1) PNNL
2) CAS
3) TAI

Turbidity Worksheet

Project ID: SW01 Non Dry Dock Storm Water

Date: 12/1/2010

Instrument Used: Model 965 IR Nephelometer

Sample ID	Turbidity (NTU)	% Recovery or RPD
0 NTU	0.0	
40 NTU	39.9	
PSNS096	20.2	
PSNS081.1	38.2	
PSNS126	5.8	
PSNS082.5 R1	33.4	
PSNS082.5 R2	33.7	1%
40 NTU	40.1	

PSNS NDDSW Monitoring
Stormwater Outfall Total Discharge Volume Estimation Equations

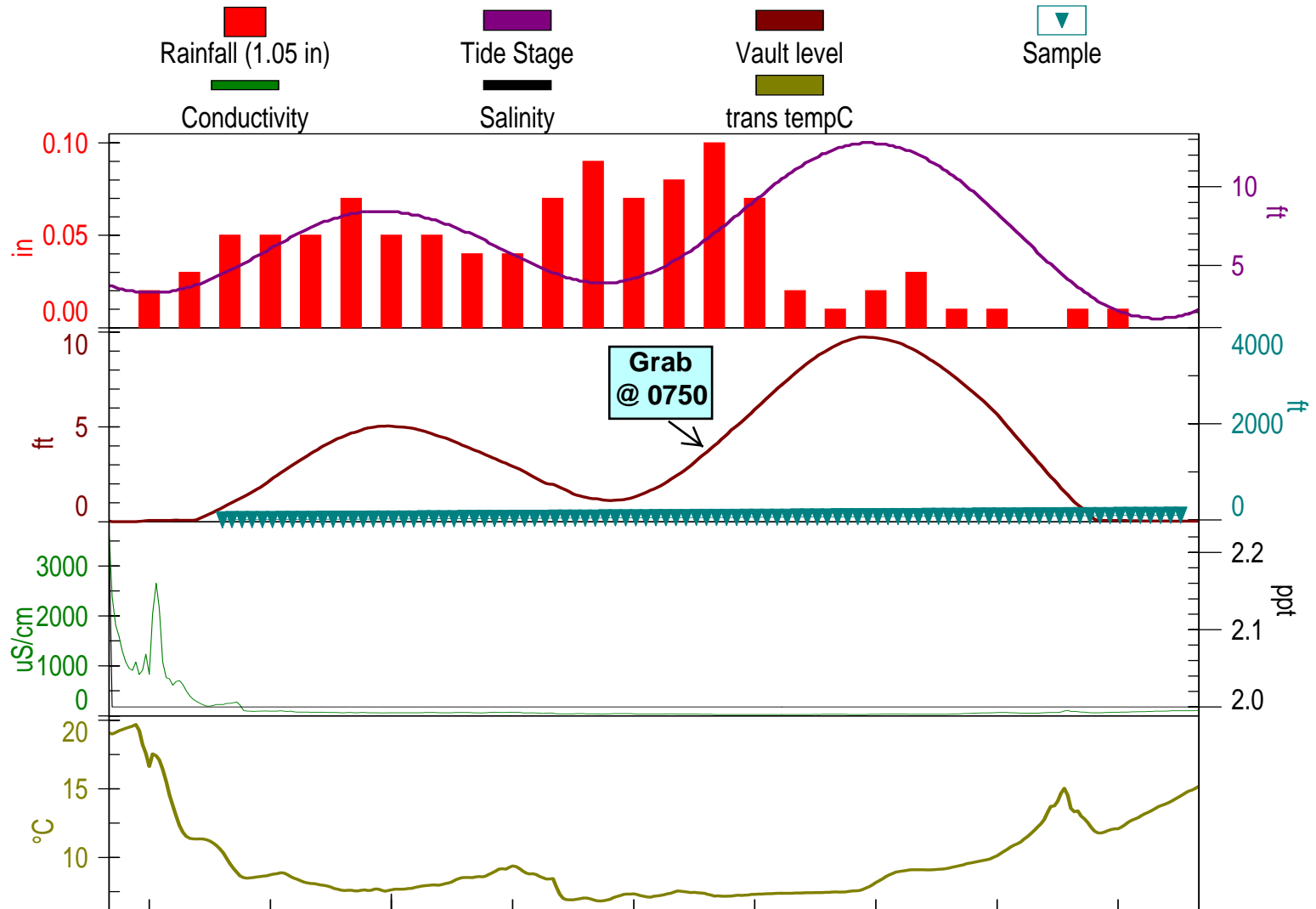
PSNS Drainage Basin	Total Basin Area (ft ²)	Type of Surface	Percentage of Drainage Basin Surface Type	Area of Basin Surface Type (ft ²)	¹ Runoff Coefficient Range	Area of Basin Surface Type with Maximum Coefficient Value Applied (ft ²)	² Total Discharge Volume (ft ³)
126	662,986	Impervious	98.55	653,373	0.6 – 0.9	588,036	R(591,881)
		Pervious	1.45	9,613	0.2 – 0.4	3,845	
096	717,872	Impervious	97	696,336	0.6 – 0.9	626,702	R(635,317)
		Pervious	3	21,536	0.2 – 0.4	8,615	
082.5	87,120	Impervious	100	87120	0.7 - 0.95	82,764	R(82,764)
081.1	965,294	Impervious	97	936,335	0.6 – 0.9	842703	R(849,074)
		Pervious	3	28,959	0.18 – 0.22	6,371	

Calculation Worksheet:	STE#2 11/29/2010
-------------------------------	-------------------------

STATION	Combined Drainage Area (FT ²)	ENTER: STE Rain Total (in)	STE Rain Total (FT)	STE Runoff Vol. (gal)	ENTER: Smpl Evnt Rain Total (in)	Sampl Evnt Rain Total (FT)	Sample Event Runoff Vol. (gal)
126	591,881	1.23	0.1025	453,826.65	1.05	0.0875	387,412.99
096	635,317	1.18	0.0983	467,329.25	1.12	0.0933	443,566.75
082.5	82,764	1.25	0.1042	64,491.42	1.17	0.0975	60,363.97
081.1	849,074	1.05	0.0875	555,757.49	0.98	0.0817	518,706.99

PSNS081.1

STE#2 11-29-2010



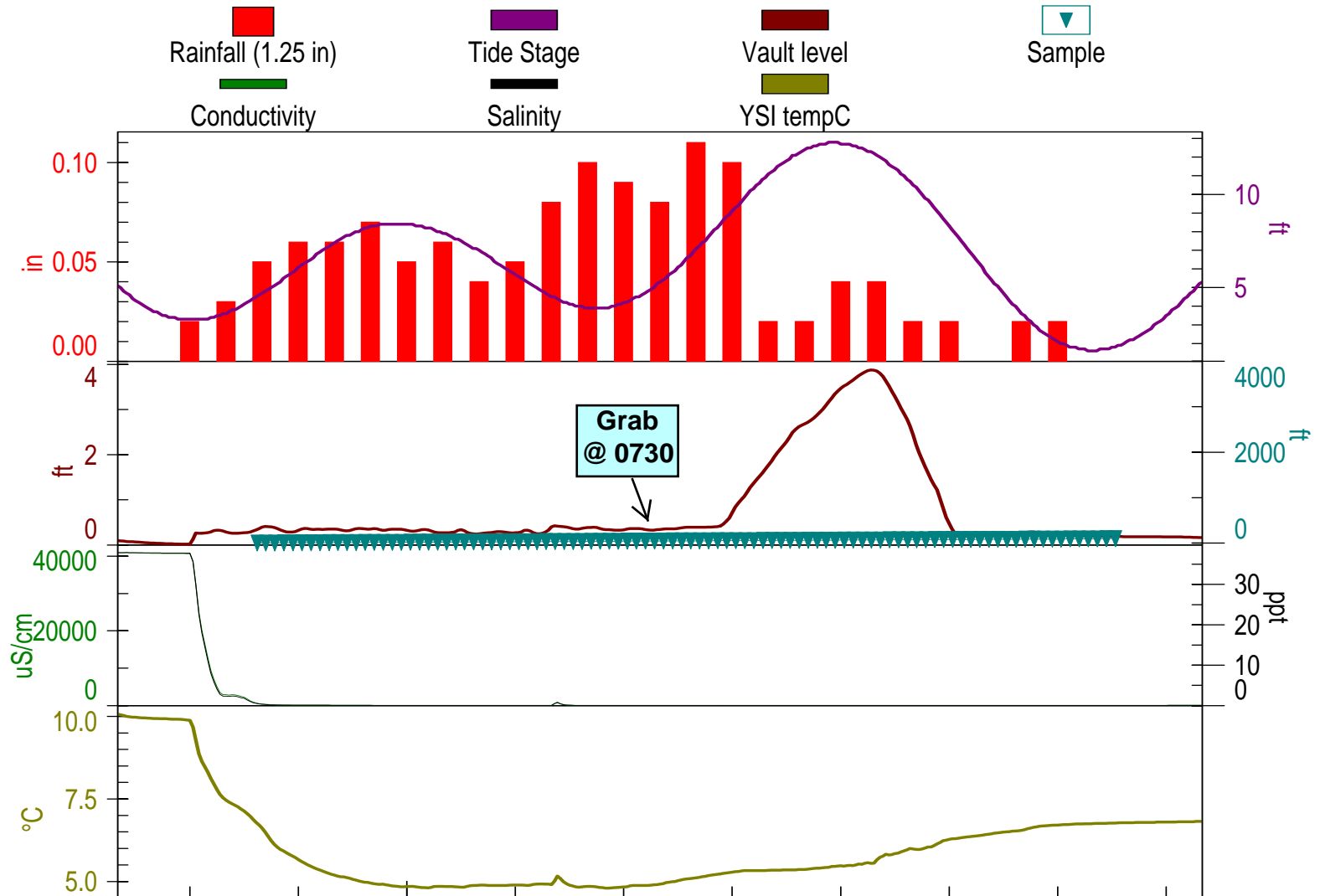
Nov 2010

30 Tue

11/29/2010 5:00:00 PM - 11/30/2010 8:00:00 PM

PSNS 082.5

STE#2 11-29-2010



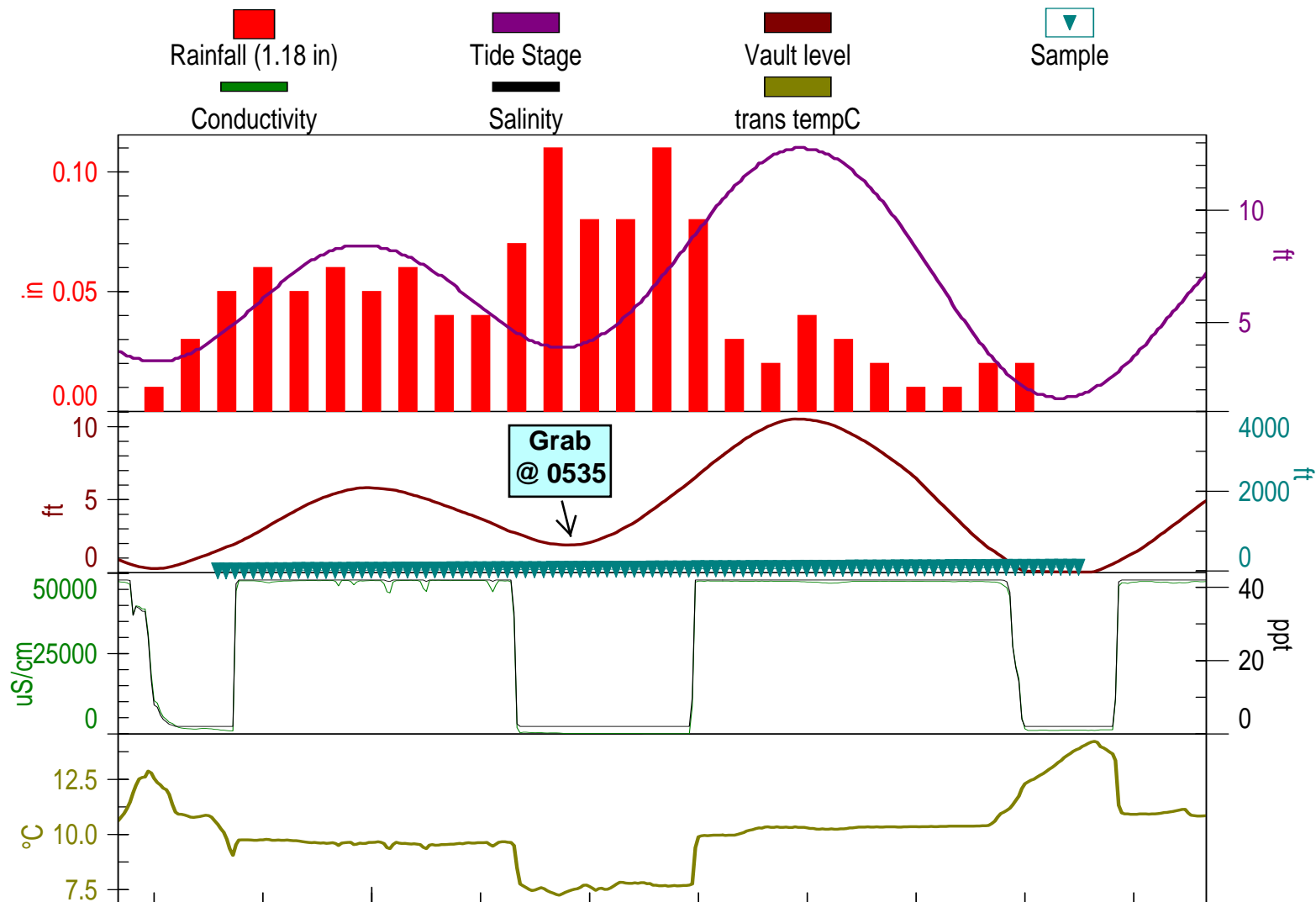
Nov 2010

30 Tue

11/29/2010 4:00:00 PM - 11/30/2010 10:00:00 PM

PSNS 096

STE#2 11-29-2010



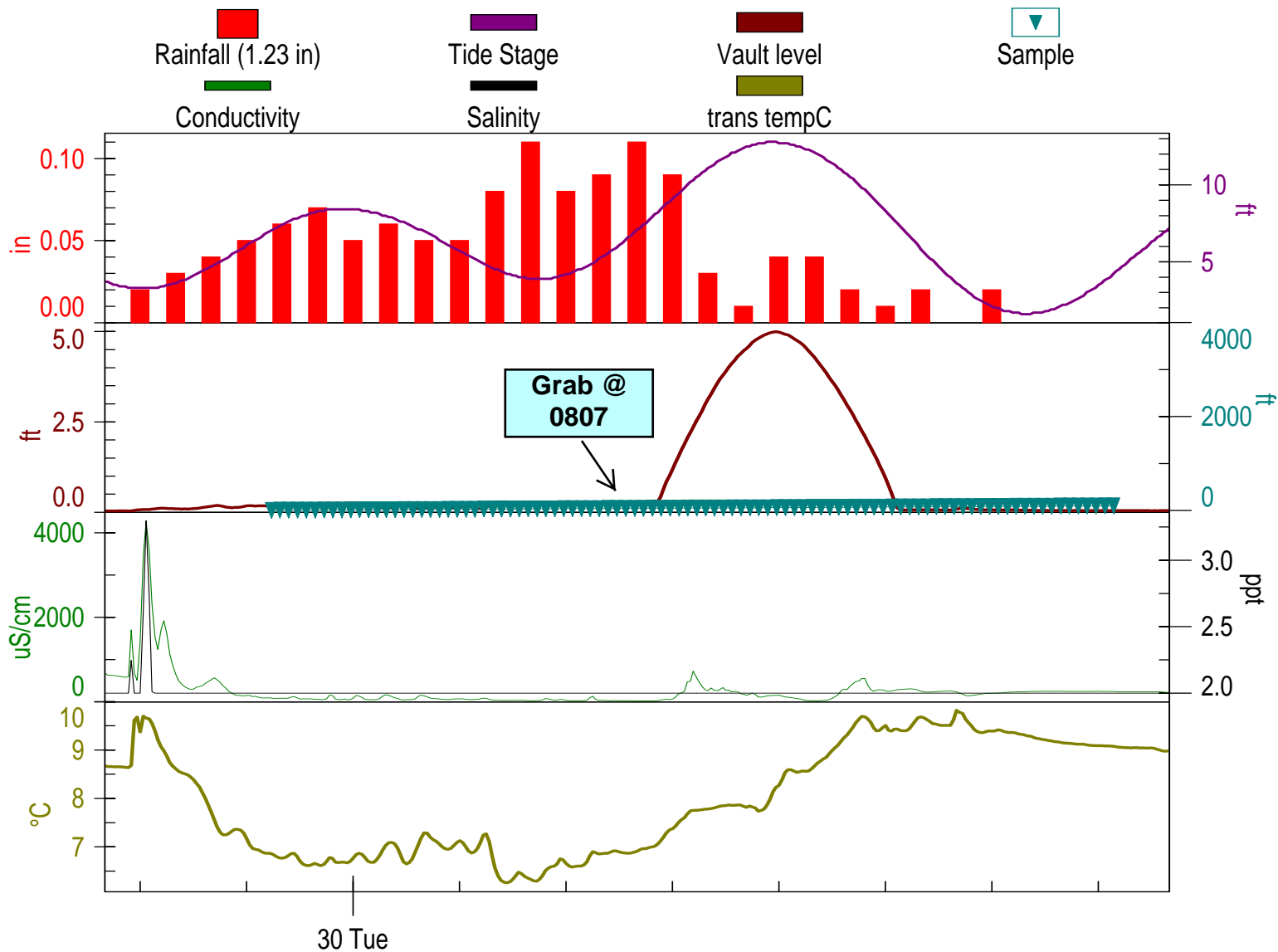
Nov 2010

30 Tue

11/29/2010 5:00:00 PM - 11/30/2010 11:00:00 PM

PSNS 126

STE#2 11-29-2010

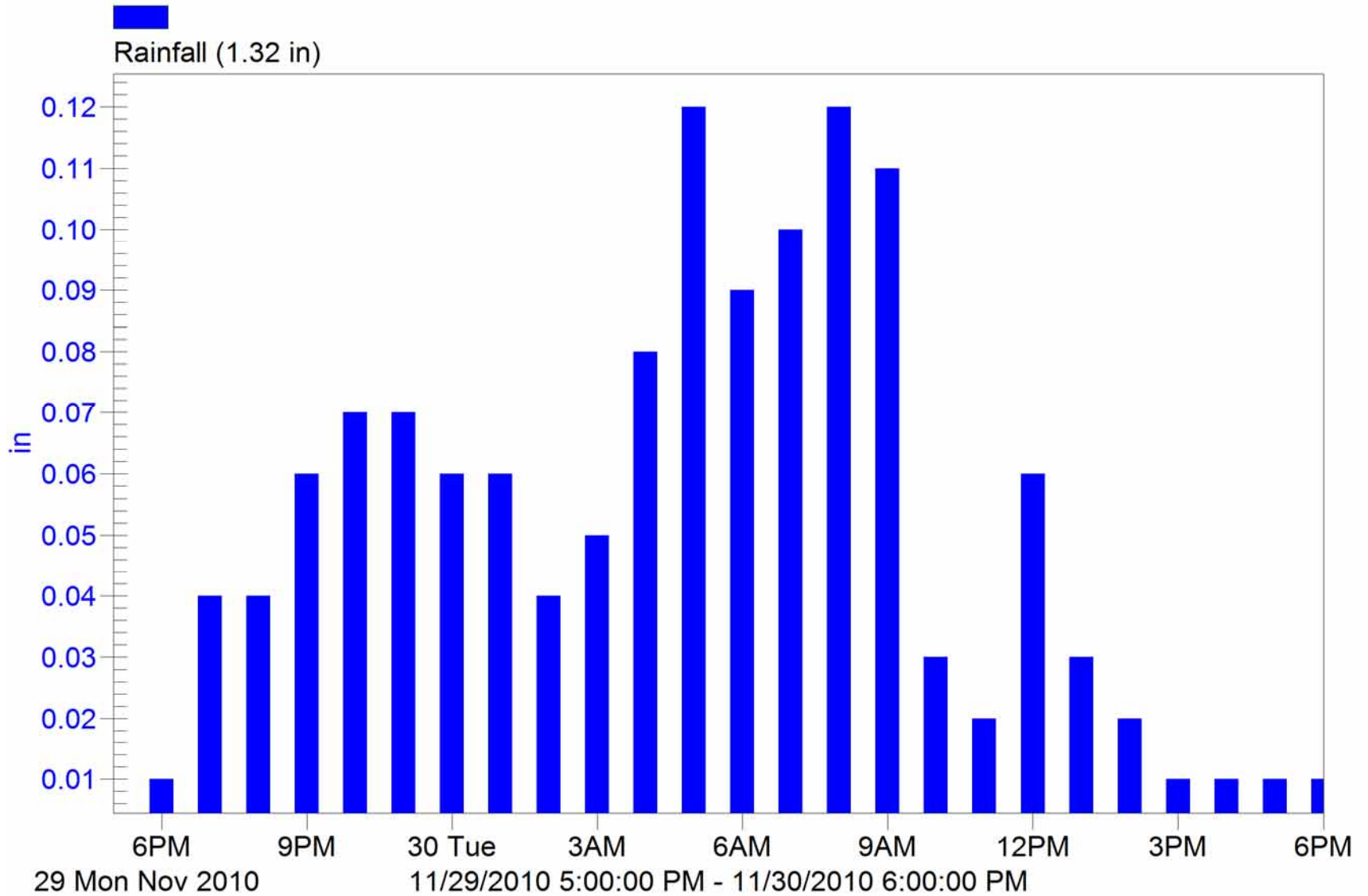


Nov 2010

11/29/2010 5:00:00 PM - 11/30/2010 11:00:00 PM

PSNS B427 Rain

STE#2 11-29-2010



STE#2 81.1 Smp1r Rpt

SAMPLER ID# 3293179321 07:55 1-DEC-10

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS081-1 "

SITE DESCRIPTION:

"PSNS081-1 "

UNITS SELECTED:

LENGTH: ft

24, 1000 m1 BTLS
39 ft SUCTION LINE
17 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 m1 SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

STE#2 81.1 Smp1r Rpt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 3293179321 07:56 1-DEC-10
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS081-1
PROGRAM: PSNS081-1
Program Started at 12:48 MO 29-NOV-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID
-----	-----	-----	---	---	-----
		12:48	PGM	DISABLED	
		19:47	PGM	ENABLED	
1,4	1	19:47	E		1327
2,4	1	20:01	F		1304
3,4	1	20:16	F		1309
4,4	1	20:31	F		1309
1,4	2	20:46	F		1291
2,4	2	21:01	F		1297
3,4	2	21:16	F		1291
4,4	2	21:31	F		1297

STE#2 81.1 Smp1r Rpt

1,4	3	21:46	F	1279
2,4	3	22:01	F	1274
3,4	3	22:16	F	1259
4,4	3	22:31	F	1256
1,4	4	22:46	F	1255
2,4	4	23:01	F	1255
3,4	4	23:16	F	1255
4,4	4	23:31	F	1256
1,4	5	23:46	F	1250
----- TU 30-NOV-10 -----				
2,4	5	00:01	F	1248
3,4	5	00:16	F	1255
4,4	5	00:31	F	1251
1,4	6	00:46	F	1254
2,4	6	01:01	F	1253
3,4	6	01:16	F	1261
4,4	6	01:31	F	1256
1,4	7	01:46	F	1259
2,4	7	02:01	F	1279
3,4	7	02:16	F	1273
4,4	7	02:31	F	1280
1,4	8	02:46	F	1278
2,4	8	03:01	F	1292
3,4	8	03:16	F	1291
4,4	8	03:31	F	1301
1,4	9	03:46	F	1309
2,4	9	04:01	F	1317
3,4	9	04:16	F	1323
4,4	9	04:31	F	1333
1,4	10	04:46	F	1323
2,4	10	05:01	F	1328
3,4	10	05:16	F	1326
4,4	10	05:31	F	1339
1,4	11	05:46	F	1334
2,4	11	06:01	F	1322
3,4	11	06:16	F	1319
4,4	11	06:31	F	1318
1,4	12	06:46	F	1307
2,4	12	07:01	F	1303
3,4	12	07:16	F	1292
4,4	12	07:31	F	1283
1,4	13	07:46	F	1268
2,4	13	08:01	F	1265
3,4	13	08:16	F	1261
4,4	13	08:31	F	1250
1,4	14	08:46	F	1235
2,4	14	09:01	F	1231
3,4	14	09:16	F	1220
4,4	14	09:31	F	1206
1,4	15	09:46	F	1205
2,4	15	10:01	F	1188
3,4	15	10:16	F	1194
4,4	15	10:31	F	1176
1,4	16	10:46	F	1188
2,4	16	11:01	F	1164
3,4	16	11:16	F	1170
4,4	16	11:31	F	1172
1,4	17	11:46	F	1155
2,4	17	12:01	F	1169
3,4	17	12:16	F	1171
4,4	17	12:31	F	1165
1,4	18	12:46	F	1176
2,4	18	13:01	F	1172

```

STE#2 81.1 SmpI'r Rpt
3,4 18 13:16 F 1178
4,4 18 13:31 F 1188
1,4 19 13:46 F 1200
2,4 19 14:01 F 1205
3,4 19 14:16 F 1210
4,4 19 14:31 F 1222
1,4 20 14:46 F 1224
2,4 20 15:01 F 1236
3,4 20 15:16 F 1249
4,4 20 15:31 F 1256
1,4 21 15:46 F 1271
2,4 21 16:01 F 1294
3,4 21 16:16 F 1295
4,4 21 16:31 F 1309
1,4 22 16:46 F 1322
2,4 22 17:01 F 1343
3,4 22 17:16 F 1347
4,4 22 17:31 F 1399
1,4 23 17:46 F 1349
2,4 23 18:01 F 1349
3,4 23 18:16 F 1647
4,4 23 18:31 F NM *
1,4 24 18:46 F NM *
2,4 24 19:01 F NL *
3,4 24 19:16 F 1355
4,4 24 19:31 F NM *
19:33 PGM DONE 30-NOV

```

```

SOURCE E ==> ENABLE
SOURCE F ==> FLOW
ERROR NL ==> NO LIQUID DETECTED!
ERROR NM ==> NO MORE LIQUID!
-----

```

STE#2 82.5 Smp1r Rpt

SAMPLER ID# 2483481595 08:02 1-DEC-10

Hardware: B2 Software: 3.21

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS082-5 "

SITE DESCRIPTION:

"PSNS082-5 "

UNITS SELECTED:

LENGTH: ft

24, 1000 m1 BTLS
13 ft SUCTION LINE
AUTO SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 m1 SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

STE#2 82.5 Smp1r Rpt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 2483481595 08:02 1-DEC-10
Hardware: B2 Software: 3.21
***** SAMPLING RESULTS *****
SITE: PSNS082-5
PROGRAM: PSNS082-5
Program Started at 11:58 MO 29-NOV-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID
-----	-----	-----	---	---	-----
		11:58	PGM	DISABLED	
		19:50	PGM	ENABLED	
1,4	1	19:50		E	382
2,4	1	20:04		F	378
3,4	1	20:19		F	382
4,4	1	20:34		F	382
1,4	2	20:49		F	382
2,4	2	21:04		F	382
3,4	2	21:19		F	382
4,4	2	21:34		F	382

STE#2 82.5 Smp1r Rpt

1,4	3	21:49	F	382
2,4	3	22:04	F	382
3,4	3	22:19	F	382
4,4	3	22:34	F	382
1,4	4	22:49	F	384
2,4	4	23:04	F	381
3,4	4	23:19	F	382
4,4	4	23:34	F	384
1,4	5	23:49	F	380
----- TU 30-NOV-10 -----				
2,4	5	00:04	F	382
3,4	5	00:19	F	382
4,4	5	00:34	F	382
1,4	6	00:49	F	382
2,4	6	01:04	F	382
3,4	6	01:19	F	384
4,4	6	01:34	F	387
1,4	7	01:49	F	382
2,4	7	02:04	F	382
3,4	7	02:19	F	382
4,4	7	02:34	F	382
1,4	8	02:49	F	382
2,4	8	03:04	F	388
3,4	8	03:19	F	386
4,4	8	03:34	F	382
1,4	9	03:49	F	382
2,4	9	04:04	F	382
3,4	9	04:19	F	382
4,4	9	04:34	F	384
1,4	10	04:49	F	386
2,4	10	05:04	F	382
3,4	10	05:19	F	384
4,4	10	05:34	F	386
1,4	11	05:49	F	382
2,4	11	06:04	F	382
3,4	11	06:19	F	382
4,4	11	06:34	F	384
1,4	12	06:49	F	380
2,4	12	07:04	F	382
3,4	12	07:19	F	382
4,4	12	07:34	F	382
1,4	13	07:49	F	382
2,4	13	08:04	F	382
3,4	13	08:19	F	382
4,4	13	08:34	F	382
1,4	14	08:49	F	384
2,4	14	09:04	F	380
3,4	14	09:19	F	377
4,4	14	09:34	F	380
1,4	15	09:49	F	376
2,4	15	10:04	F	380
3,4	15	10:19	F	376
4,4	15	10:34	F	374
1,4	16	10:49	F	374
2,4	16	11:04	F	374
3,4	16	11:19	F	374
4,4	16	11:34	F	374
1,4	17	11:49	F	374
2,4	17	12:04	F	374
3,4	17	12:19	F	374
4,4	17	12:34	F	368
1,4	18	12:49	F	374
2,4	18	13:04	F	374

```

STE#2 82.5 SmpI'r Rpt
3,4 18 13:19 F 374
4,4 18 13:34 F 374
1,4 19 13:49 F 374
2,4 19 14:04 F 380
3,4 19 14:19 F 378
4,4 19 14:34 F 384
1,4 20 14:49 F 386
2,4 20 15:04 F NL *
3,4 20 15:19 F NL *
4,4 20 15:34 F NL *
1,4 21 15:49 F NL *
2,4 21 16:04 F NL *
3,4 21 16:19 F NL *
4,4 21 16:34 F NL *
1,4 22 16:49 F NL *
2,4 22 17:04 F 381
3,4 22 17:19 F 384
4,4 22 17:34 F NM *
1,4 23 17:49 F NL *
2,4 23 18:04 F NL *
3,4 23 18:19 F NL *
4,4 23 18:34 F NL *
1,4 24 18:49 F NL *
2,4 24 19:04 F NL *
3,4 24 19:19 F NL *
4,4 24 19:34 F NL *
19:35 PGM DONE 30-NOV

```

```

SOURCE E ==> ENABLE
SOURCE F ==> FLOW
ERROR NL ==> NO LIQUID DETECTED!
ERROR NM ==> NO MORE LIQUID!

```

```

-----
SAMPLER ID# 2483481595 08:03 1-DEC-10
Hardware: B2 Software: 3.21
MODULE: NONE
Hardware: Software: 0.00
***** COMBINED RESULTS *****
SITE: PSNS082-5
PROGRAM: PSNS082-5
Program Started at 11:58 MO 29-NOV-10
Nominal Sample Volume = 240 ml

```

```

MODULE: NONE
-----

```

```

SAMPLER ID# 2483481595 08:03 1-DEC-10
Hardware: B2 Software: 3.21
***** COMBINED RESULTS *****
SITE: PSNS082-5
PROGRAM: PSNS082-5
Program Started at 11:58 MO 29-NOV-10
Nominal Sample Volume = 240 ml
FR-TEMP
SAMPLE BOTTLE TIME C
-----

```

STE#2 82.5 Smp1r Rpt
NO FR-TEMPERATURE

STE#2 096 Smp1r Rpt

SAMPLER ID# 3293179316 08:10 1-DEC-10

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS096"

SITE DESCRIPTION:

"PSNS096"

UNITS SELECTED:

LENGTH: ft

24, 1000 m1 BTLS
20 ft SUCTION LINE
17 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 m1 SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

STE#2 096 Smp1r Rpt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 3293179316 08:10 1-DEC-10
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS096
PROGRAM: PSNS096
Program Started at 10:57 MO 29-NOV-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID
-----	-----	-----	---	---	-----
		10:57	PGM	DISABLED	
		19:43	PGM	ENABLED	
1,4	1	19:43		E	642
2,4	1	19:57		F	642
3,4	1	20:12		F	653
4,4	1	20:27		F	643
1,4	2	20:42		F	638
2,4	2	20:57		F	635
3,4	2	21:12		F	632
4,4	2	21:27		F	629

STE#2 096 Smp1r Rpt

1,4	3	21:42	F	625
2,4	3	21:57	F	626
3,4	3	22:12	F	623
4,4	3	22:27	F	619
1,4	4	22:42	F	619
2,4	4	22:57	F	619
3,4	4	23:12	F	611
4,4	4	23:27	F	612
1,4	5	23:42	F	613
2,4	5	23:57	F	611
----- TU 30-NOV-10 -----				
3,4	5	00:12	F	614
4,4	5	00:27	F	613
1,4	6	00:42	F	620
2,4	6	00:57	F	617
3,4	6	01:12	F	619
4,4	6	01:27	F	619
1,4	7	01:42	F	619
2,4	7	01:57	F	621
3,4	7	02:12	F	626
4,4	7	02:27	F	632
1,4	8	02:42	F	630
2,4	8	02:57	F	637
3,4	8	03:12	F	637
4,4	8	03:27	F	643
1,4	9	03:42	F	643
2,4	9	03:57	F	638
3,4	9	04:12	F	643
4,4	9	04:27	F	650
1,4	10	04:42	F	649
2,4	10	04:57	F	643
3,4	10	05:12	F	649
4,4	10	05:27	F	649
1,4	11	05:42	F	649
2,4	11	05:57	F	648
3,4	11	06:12	F	649
4,4	11	06:27	F	642
1,4	12	06:42	F	635
2,4	12	06:57	F	637
3,4	12	07:12	F	632
4,4	12	07:27	F	631
1,4	13	07:42	F	625
2,4	13	07:57	F	619
3,4	13	08:12	F	613
4,4	13	08:27	F	613
1,4	14	08:42	F	607
2,4	14	08:57	F	605
3,4	14	09:12	F	600
4,4	14	09:27	F	597
1,4	15	09:42	F	594
2,4	15	09:57	F	587
3,4	15	10:12	F	587
4,4	15	10:27	F	589
1,4	16	10:42	F	584
2,4	16	10:57	F	581
3,4	16	11:12	F	584
4,4	16	11:27	F	581
1,4	17	11:42	F	583
2,4	17	11:57	F	576
3,4	17	12:12	F	581
4,4	17	12:27	F	584
1,4	18	12:42	F	582
2,4	18	12:57	F	584

STE#2 096 Smp1r Rpt

3,4	18	13:12	F	587
4,4	18	13:27	F	587
1,4	19	13:42	F	590
2,4	19	13:57	F	593
3,4	19	14:12	F	597
4,4	19	14:27	F	600
1,4	20	14:42	F	605
2,4	20	14:57	F	613
3,4	20	15:12	F	620
4,4	20	15:27	F	619
1,4	21	15:42	F	626
2,4	21	15:57	F	637
3,4	21	16:12	F	637
4,4	21	16:27	F	649
1,4	22	16:42	F	655
2,4	22	16:57	F	655
3,4	22	17:12	F	667
4,4	22	17:27	F	667
1,4	23	17:42	F	673
2,4	23	17:57	F	673
3,4	23	18:12	F	673
4,4	23	18:27	F	673
1,4	24	18:42	F	673
2,4	24	18:57	F	673
3,4	24	19:12	F	673
4,4	24	19:27	F	673
19:27 PGM DONE 30-NOV				

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW

STE#2 126 Smp1r Rpt

SAMPLER ID# 2425481222 07:44 1-DEC-10

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS126"

SITE DESCRIPTION:

"PSNS126"

UNITS SELECTED:

LENGTH: ft

24, 1000 m1 BTLS
24 ft SUCTION LINE
13 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 m1 SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

STE#2 126 Smp1r Rpt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 2425481222 07:44 1-DEC-10
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS126
PROGRAM: PSNS126
Program Started at 12:59 MO 29-NOV-10
Nominal Sample volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID
-----	-----	-----	---	---	-----
		12:59	PGM	DISABLED	
		21:40	PGM	ENABLED	
1,4	1	21:40		E	679
2,4	1	21:54		F	674
3,4	1	22:09		F	674
4,4	1	22:24		F	680
1,4	2	22:39		F	682
2,4	2	22:54		F	674
3,4	2	23:09		F	676
4,4	2	23:24		F	674

STE#2 126 Smp1r Rpt

1,4	3	23:39	F	674
2,4	3	23:54	F	675
----- TU 30-NOV-10 -----				
3,4	3	00:09	F	680
4,4	3	00:24	F	677
1,4	4	00:39	F	683
2,4	4	00:54	F	675
3,4	4	01:09	F	681
4,4	4	01:24	F	682
1,4	5	01:39	F	680
2,4	5	01:54	F	682
3,4	5	02:09	F	682
4,4	5	02:24	F	683
1,4	6	02:39	F	680
2,4	6	02:54	F	676
3,4	6	03:09	F	683
4,4	6	03:24	F	686
1,4	7	03:39	F	677
2,4	7	03:54	F	680
3,4	7	04:09	F	682
4,4	7	04:24	F	677
1,4	8	04:39	F	680
2,4	8	04:54	F	680
3,4	8	05:09	F	686
4,4	8	05:24	F	678
1,4	9	05:39	F	674
2,4	9	05:54	F	681
3,4	9	06:09	F	682
4,4	9	06:24	F	690
1,4	10	06:39	F	677
2,4	10	06:54	F	680
3,4	10	07:09	F	682
4,4	10	07:24	F	680
1,4	11	07:39	F	682
2,4	11	07:54	F	684
3,4	11	08:09	F	682
4,4	11	08:24	F	678
1,4	12	08:39	F	676
2,4	12	08:54	F	664
3,4	12	09:09	F	664
4,4	12	09:24	F	658
1,4	13	09:39	F	656
2,4	13	09:54	F	653
3,4	13	10:09	F	646
4,4	13	10:24	F	647
1,4	14	10:39	F	641
2,4	14	10:54	F	640
3,4	14	11:09	F	635
4,4	14	11:24	F	632
1,4	15	11:39	F	628
2,4	15	11:54	F	629
3,4	15	12:09	F	634
4,4	15	12:24	F	632
1,4	16	12:39	F	635
2,4	16	12:54	F	633
3,4	16	13:09	F	640
4,4	16	13:24	F	647
1,4	17	13:39	F	645
2,4	17	13:54	F	652
3,4	17	14:09	F	653
4,4	17	14:24	F	659
1,4	18	14:39	F	663
2,4	18	14:54	F	676

STE#2 126 Smp1r Rpt

3,4	18	15:09	F	674
4,4	18	15:24	F	681
1,4	19	15:39	F	683
2,4	19	15:54	F	686
3,4	19	16:09	F	680
4,4	19	16:24	F	682
1,4	20	16:39	F	687
2,4	20	16:54	F	681
3,4	20	17:09	F	688
4,4	20	17:24	F	688
1,4	21	17:39	F	688
2,4	21	17:54	F	689
3,4	21	18:09	F	689
4,4	21	18:24	F	688
1,4	22	18:39	F	688
2,4	22	18:54	F	682
3,4	22	19:09	F	680
4,4	22	19:24	F	682
1,4	23	19:39	F	687
2,4	23	19:54	F	681
3,4	23	20:09	F	688
4,4	23	20:24	F	688
1,4	24	20:39	F	689
2,4	24	20:54	F	688
3,4	24	21:09	F	688
4,4	24	21:24	F	688
		21:24	PGM DONE	30-NOV

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW

National Weather Service National Headquarters

National Weather Service

Area Forecast Discussion

Issued by NWS Seattle/Tacoma, WA

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FXUS66 KSEW 292307
AFDSEW

[AREA FORECAST DISCUSSION](#)

NATIONAL WEATHER SERVICE SEATTLE WA
300 PM PST MON NOV 29 2010

.SYNOPSIS...A STRONG FRONTAL SYSTEM WILL BRING RAIN...WIND...AND HEAVY MOUNTAIN SNOW THIS AFTERNOON THROUGH TUESDAY. A [TROUGH](#) WILL LINGER OVER THE REGION FOR THE REMAINDER OF THE WEEK FOR A CHANCE OF SHOWERS.

&&

.SHORT TERM...[RADAR](#) AND [OBS](#) INDICATE LIGHT RAIN ALONG THE COAST IS VERY SLOWLY SPREADING INLAND THIS AFTERNOON AS EXPECTED. DRIER AIR INLAND AT THE LOW LEVELS WILL TAKE A FEW MORE HOURS TO MOISTEN UP BUT RAIN WILL EVENTUALLY DEVELOP ACROSS ALL OF WRN WA BY EARLY THIS EVENING. SEE THE [HYDROLOGY](#) SECTION FOR DETAILS ON [QPF](#).

SNOW LEVELS ARE CURRENTLY HOVERING AROUND 2000-2500 FEET BUT WILL RISE TO 5000 FEET BEHIND A WARM [FRONT](#) AS STRONG SW [FLOW](#) DEVELOPS. MODELS DELAY WARMING OVER THE CASCADES UNTIL LATE TONIGHT OR EARLY TUE MORNING WITH [ELY](#) GRADIENTS KEEPING COLD AIR TRAPPED IN THE PASSES. THIS STILL BODES WELL FOR A PERIOD OF FREEZING RAIN TUE MORNING. SNOWFALL AMOUNTS MAY BE CONSIDERABLY LESS IN THE PASSES WHICH MAY RECEIVE SNOW TONIGHT GOING OVER TO FREEZING RAIN OR A MIX THEN BACK TO SNOW TUESDAY AFTERNOON. ABOVE 5000 FEET PRECIP SHOULD REMAIN ALL SNOW WITH [QPF](#) SUPPORTING UP TO 2 FEET ALONG SLOPES FAVORED BY SLY [FLOW](#) SUCH AS BAKER OR PARADISE. ELSEWHERE...PERHAPS 6 TO 12 INCHES AS IT WILL TAKE LONGER FOR SNOW TO BEGIN AND ALSO THE FREEZING RAIN POTENTIAL IN THE PASSES. MODEL BUFFER SOUNDINGS SINGLED OUT SNOQUALMIE AND STAMPEDE PASSES AS THE BEST CANDIDATES FOR FREEZING RAIN TUE MORNING...MAYBE AROUND ONE QUARTER INCH ICE ON TOP OF THE SNOW...BEFORE GOING BACK OVER TO SNOW BEHIND THE [FRONT](#) TUE AFTERNOON. THE WINTER STORM STATEMENT WAS UPDATED EARLIER TO ACCOUNT FOR THIS POSSIBILITY.

THIS SYSTEM WILL ALSO PACK SOME STRONG SLY/SE WINDS. MOST MODELS ARE SHOWING 925 [MB](#) SLY WINDS UP TO 50-60 [KT](#) ALONG THE COAST AND N INTERIOR. AS THE [FRONT](#) APPROACHES LATE TONIGHT THERE MAY BE ENOUGH MIXING TO SURFACE SOME STRONGER GUSTS TO THE SURFACE. ALONG THE COAST...E/SE GRADIENTS WILL LIMIT THE SUSTAINED WINDS BUT GUSTS IN THE 55 MPH RANGE SEEM REASONABLE GIVEN THE VERY STRONG [FLOW](#) JUST OFF THE SURFACE. THE MM5 MODELS APPEAR TO AGREE WITH THE AREA OF SUSTAINED 35+ [KT](#) WINDS WELL OFFSHORE OVER THE [COASTAL WATERS](#). SE GRADIENTS AND THE FORMATION OF A [MESO](#) LOW IN THE [LEE](#) OF THE OLYMPICS ARE FAVORABLE FOR STRONGER WINDS FROM THE ADMIRALTY INLET/WHIDBEY ISLAND AREAS [NWD](#). [MESO](#) MODELS ALSO SHOW MAX WINDS OF 35 [KT](#) OVER THE WATERS IN THIS AREA WHICH SUPPORT AROUND 20-30 MPH SUSTAINED WITH HIGHER GUSTS OVER LAND. THE WIND ADVISORY REMAINS IN EFFECT FOR THE N INTERIOR UNTIL THE [FRONT](#) PASSES TUESDAY MORNING. THE STRONGEST WINDS ACROSS THE PUGET SOUND REGION WILL OCCUR LATER...JUST ALONG AND BEHIND THE [FRONT](#) EARLY TUESDAY MORNING. LOOKS JUST BELOW ADVISORY CRITERIA BUT WILL INCLUDE SOME GUSTS TO AROUND 40 MPH. WINDS WILL EASE ACROSS THE ENTIRE AREA TUESDAY AFTERNOON AS THE [FRONT](#) MOVES EAST.

POST FRONTAL [WLY FLOW](#) WILL WEAKEN TUESDAY NIGHT ALLOWING SNOW TO TAPER OFF IN THE MOUNTAINS. A FEW MORE INCHES OF SNOW ARE POSSIBLE ABOVE 3000 FEET AS SNOW LEVELS COME BACK DOWN BEHIND THE [FRONT](#). JUST RAIN SHOWERS FOR THE LOWLANDS.

MODELS INDICATE THAT THE UPPER [FLOW](#) WILL BECOME SOMEWHAT SPLIT ACROSS THE WEST COAST ON WEDNESDAY WITH AN UPPER LOW OVER THE CENTRAL [B.C.](#) COAST AND A WAVE DEVELOPING OFF THE [CA](#) COAST. WRN WA IS STILL UNDER [WLY](#) ONSHORE [FLOW](#) AND SOMEWHAT MOIST [FLOW](#) SO THE CHANCE OF RAIN WILL REMAIN IN THE FORECAST...THOUGH A MOSTLY DRY DAY IS NOT OUT OF THE QUESTION.

.LONG TERM...BOTH THE [GFS/ECMWF](#) SEEM TO BE HAVING DIFFICULTY RESOLVING DETAILS DUE TO THE MESSY SPLIT [FLOW](#) OVER THE AREA. MODELS SEEM TO BE TRYING TO CONSOLIDATE THE [FLOW](#) SOMEWHAT WITH SOME RUNS LIFTING SOME OF THE [MOISTURE](#) ASSOCIATED WITH THE WAVE OVER [CA NWD](#) TOWARD OUR AREA. A [TROUGH](#) WILL BE MOVING THROUGH ON THURSDAY AS WELL. EITHER WAY...RAIN FROM THE WAVE OR JUST SHOWERS UNDER A [TROUGH](#)...KEPT [LIKELY POPS](#) IN FOR THE AREA AS SOME PRECIP IS EXPECTED. [POPS](#) WERE TRENDED BACK DOWN TO CHANCE CATEGORY FOR FRIDAY THROUGH THE WEEKEND AS THE [GFS/ECMWF](#) HAVE BOTH TRENDED TOWARD MORE RIDGING OVER THE REGION. NOT READY TO TRY PULLING [POPS](#) OUT ALL TOGETHER GIVEN [CLIMO](#) AND BEING THE EXTENDED PORTION OF THE FORECAST. WILL NEED TO [WATCH](#) HOW MODELS TREND AND CONSIDER DRYING THINGS OUT IF MODELS CONTINUE TO SHOW THIS SOLUTION. THIS RIDGING IS IN RESPONSE TO A BROAD DEEP [TROUGH](#) DEVELOPING OVER THE ERN [PAC](#) NEAR 150 W. LONG RANGE MODELS INDICATE THIS WILL MIGRATE [EWD](#) TO RENEW PRECIP OVER THE AREA SOMETIME EARLY NEXT WEEK.

MERCER

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.[HYDROLOGY](#)...VERY LITTLE CHANGE IN THE [QPF](#) EXPECTED WITH THE FRONTAL SYSTEM TO AFFECT THE REGION TONIGHT THROUGH TUESDAY. FOR MOST OF WRN WA THE LOW SNOW LEVELS DURING PART OF THIS EVENING WILL PRECLUDE FLOODING ON AREA RIVERS. THE ONE EXCEPTION PER USUAL IS THE SKOKOMISH RIVER WHERE SNOW LEVELS WILL RISE MOST THE [BASIN](#) AHEAD OF THE HEAVIEST PRECIP TONIGHT AND EARLY TUESDAY. IN ADDITION...HEAVIER [RAINFALL](#) IN THIS [BASIN](#) IS ALSO HEAVILY FAVORED BY STRONG S/SW [FLOW](#) ALOFT. WHILE THE [FRONT](#) IS PROGRESSIVE IN NATURE...MODELS STILL PUT DOWN A MAX OF ABOUT 2 INCHES IN 12 HOURS IN THE [BASIN](#). LOCAL STUDIES AS WELL AND THE LATEST HYDRO MODEL RUNS STILL INDICATE THE SKOKOMISH RIVER WILL PEAK BELOW [FLOOD](#) STAGE BUT WITHIN ADVISORY CRITERIA. THIS SEEMS REASONABLE BUT WILL NEED TO MONITOR THE RIVER CLOSELY TONIGHT IN CASE THE [FRONT](#) SLOWS OR [RAINFALL](#) IS HEAVIER THAN EXPECTED. SEE THE LATEST HYDRO STATEMENT FOR DETAILS. NO FLOODING IS EXPECTED ON THE GREEN RIVER WITH THIS SYSTEM.

MODELS INDICATE GENERALLY WEAK WEATHER SYSTEMS LATER THIS WEEK AND THROUGH THE WEEKEND. PERHAPS EVEN A DAY OR TWO OF DRY WEATHER. EXTENDED MODEL RUNS SUGGEST A BROAD TROUGH OVER THE ERN [PAC](#) SHOULD BEGIN TO EDGE [EWD](#) BY EARLY TO THE MIDDLE OF NEXT WEEK. THIS COULD OPEN THE DOOR TO SOME WETTER FRONTS. FLOODING IS NOT EXPECTED ON THE GREEN RIVER OVER THE NEXT 7 DAYS.

&&

.AVIATION...AN UPPER [TROF](#) AND VIGOROUS FRONTAL SYSTEM ARE JUST OFFSHORE THE PACNW. THE WARM [FRONT](#) IS RIGHT OFF THE COAST AT 2PM AND THE COLD [FRONT](#) WAS OUT [ARND](#) 130W BUT FOR ALL INTENTS AND PURPOSES THIS ROLLS THRU WRN WA AS STRONG OCCLUSION AND I WOULDN'T EXPECT CONDITIONS TO DO ANYTHING BUT DETERIORATE TIL [FROPA](#) LATER TUE MORNING. SO...LOWERING CIGS TO [MVFR](#)...[LCL](#) [IFR](#) CIGS POSSIBLE LATE TONIGHT TIL [FROPA](#)...AREAS OF LOWER [VSBY](#) IN THE [PCPN](#)...WHICH IS SNOW NOT FAR OFF THE SURFACE...AMDAR SOUNDINGS SHOW THE [FREEZING LEVEL](#) EARLY THIS AFTERNOON WAS STILL 2500FT...FOR ABOUT A 1500FT SNOW LEVEL BUT THE [AIR MASS](#) WILL WARM OVERNIGHT AND 850MB TEMPS SHOULD PEAK ABOVE FREEZING WITH HEAVY WET SNOW OR RAIN UP AT THAT LEVEL AT DAYBREAK. [MTNS](#) AND HILLS WILL BE OBSCURED [TNGT](#) INTO TUE. NO BIG CHANGES TO THE TAFS. 19

KSEA...[TAF](#) STILL LOOKS GOOD...THE SLY WIND IN THE LOWER TO MID LEVELS WILL BE FAIRLY STRONG LATER [TNGT](#) TIL [FROPA](#) [ARND](#) TUE MORNING...2000FT WIND SHOULD BE S 40KT JUST TUE MORNING UP TIL THE [FROPA](#) [ARND](#) 19Z.

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.MARINE...[GALE](#) WARNINGS CONTINUE ALL WATERS XCP CENTRAL STRAIT AND PUGET SOUND/HOOD CANAL WITH ADVISORIES. [FCST](#) SHOULD BE ABOUT THE SAME AS THE MORNING PACKAGE AND I HAVE NO REASON TO DOUBT THE [MESOSCALE](#) MODELS WHICH BRING A FULL [GALE](#) INTO ALL THE REGULAR SPOTS THIS EVENING. WINDS WILL SETTLE DOWN AFTER THE [FROPA](#) QUICKLY TUE. I FOLLOWED THE PREVIOUS SHIFT AND KEPT COMBINED [SEAS](#) TONIGHT SINCE WE WERE STARTING OUT WITH SUCH LITTLE [SWELL](#)...BUT LATER TUE OR EARLY WED A [WLY SWELL](#) SHOULD BUILD AND WORK INTO THE [COASTAL WATERS](#). THE GRAYS HARBOR [BAR](#) FORECAST WILL NEED A [SMALL CRAFT](#) AS THE [SWELL](#) BUILDS...BUT WITH A [GALE BLOWING](#) TIMING THE [SEAS](#) COMING UP IS NOT YET A PRIORITY...BUT CERTAINLY BY TUE NITE THE [SWELL](#) OUGHT TO BE CLIMBING TO [ARND](#) 14FT. 19

&&

.SEW WATCHES/WARNINGS/ADVISORIES...
WA...[FLOOD](#) PRODUCTS IN EFFECT FOR MASON COUNTY.
.WINTER STORM [WARNING](#) FOR THE OLYMPICS AND CASCADES.
.WIND ADVISORY FOR THE NORTHWEST INTERIOR.
PZ...[GALE WARNING](#) [COASTAL WATERS](#)..ENTRANCES TO THE STRAIT OF JUAN DE

FUCA...ADMIRALTY INLET...AND NORTHERN INLAND WATERS.
. [SMALL CRAFT ADVISORY](#) FOR THE REMAINING WATERS.

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WWW.WEATHER.GOV/SEATTLE

FOR AN ILLUSTRATED VERSION OF THE FORECAST DISCUSSION...PLEASE SEE
WWW.WEATHER.GOV/SEATTLE/GAFD/LATEST_WEBAFD.HTML.

National Weather Service
National Weather Service National Headquarters
1325 East West Highway
Silver Spring, MD 20910
Incorrect Region Format!
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Page last modified: Feb 16th, 2010 21:51 UTC


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NWS Seattle, WA










Point Forecast: Bremerton WA
47.56°N 122.62°W (Elev. 0 ft)

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Last Update: 3:12 pm PST Nov 29, 2010

Forecast Valid: 5pm PST Nov 29, 2010-6pm PST Dec 6, 2010

Forecast at a Glance

Late Afternoon	Tonight	Tuesday	Tuesday Night	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday
								
90% Rain	90% Rain	90% Showers	60% Showers Likely	40% Chance Showers	60% Showers Likely	60% Showers Likely	60% Showers Likely	Chance Showers
Hi 43 °F	Lo 41 °F	Hi 46 °F	Lo 38 °F	Hi 42 °F	Lo 34 °F	Hi 41 °F	Lo 35 °F	Hi 40 °F

Detailed 7-day Forecast

Detailed Point Forecast [Move Down]

Late Afternoon: Rain. High near 43. South wind around 10 mph. Chance of precipitation is 90%.

Tonight: Rain. Low around 41. South wind between 11 and 13 mph, with gusts as high as 18 mph. Chance of precipitation is 90%.

Tuesday: Showers. High near 46. Breezy, with a south southwest wind between 20 and 22 mph, with gusts as high as 36 mph. Chance of precipitation is 90%.

Tuesday Night: Showers likely. Mostly cloudy, with a low around 38. South wind between 6 and 16 mph. Chance of precipitation is 60%.

Wednesday: A 40 percent chance of showers. Mostly cloudy, with a high near 42. Calm wind becoming south around 5 mph.

Wednesday Night: Showers likely. Cloudy, with a low around 34. Chance of precipitation is 60%.

Thursday: Showers likely. Cloudy, with a high near 41. Chance of precipitation is 60%.

Thursday Night: Showers likely. Cloudy, with a low around 35.

Friday: A chance of showers. Partly sunny, with a high near 40.

Friday Night: A chance of showers. Mostly cloudy, with a low around 35.

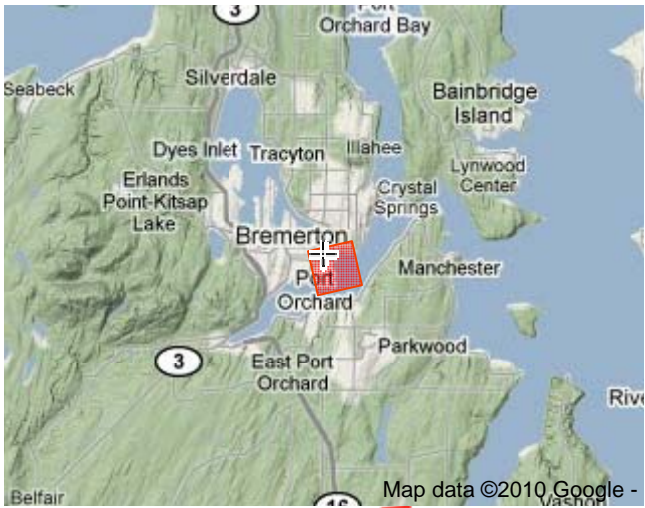
Saturday: A chance of showers. Mostly cloudy, with a high near 40.

Saturday Night: A chance of rain. Cloudy, with a low around 33.

Sunday: A chance of rain. Cloudy, with a high near 39.

Sunday Night: A chance of rain. Cloudy, with a low around 32.



Click Map for Forecast [Disclaimer](#)



Map data ©2010 Google -

Requested Location ■ Forecast Area

Lat/Lon: 47.56°N 122.62°W **Elevation:** 0 ft

Current Conditions [Move Up]

Bremerton, Bremerton National Airport

Last Update on 29 Nov 16:35 PST

Overcast

39°F

(4°C)

Humidity: 87 %

Wind Speed: S 3 MPH

Barometer: 30.29 in (N/A mb)

Dewpoint: 36°F (2°C)

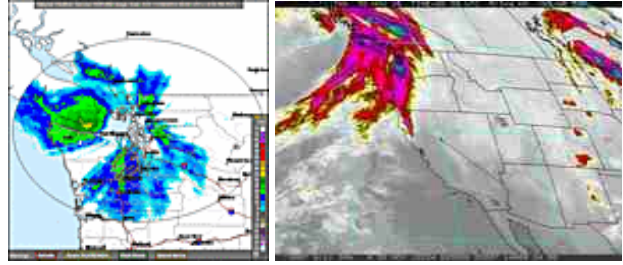
Wind Chill: 37°F (3°C)

Visibility: 10.00 Miles

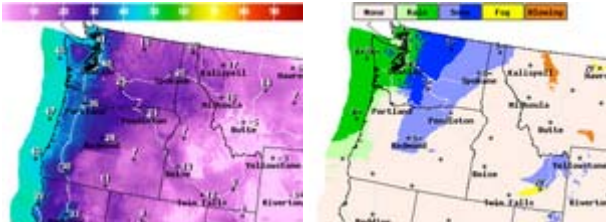
[More Local Wx:](#) [3 Day History:](#)

Radar and Satellite Images

Monday: A chance of rain. Cloudy, with a high near 39.



National Digital Forecast Database



Additional Forecasts & Information

[Zone Area Forecast for Seattle/Bremerton Area, WA](#)

[Forecast Discussion](#)

[Printable Forecast](#)

[Text Only Forecast](#)

[Hourly Weather Graph](#)

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Point Forecast: Bremerton WA
47.56N 122.62W (Elev. 0 ft)

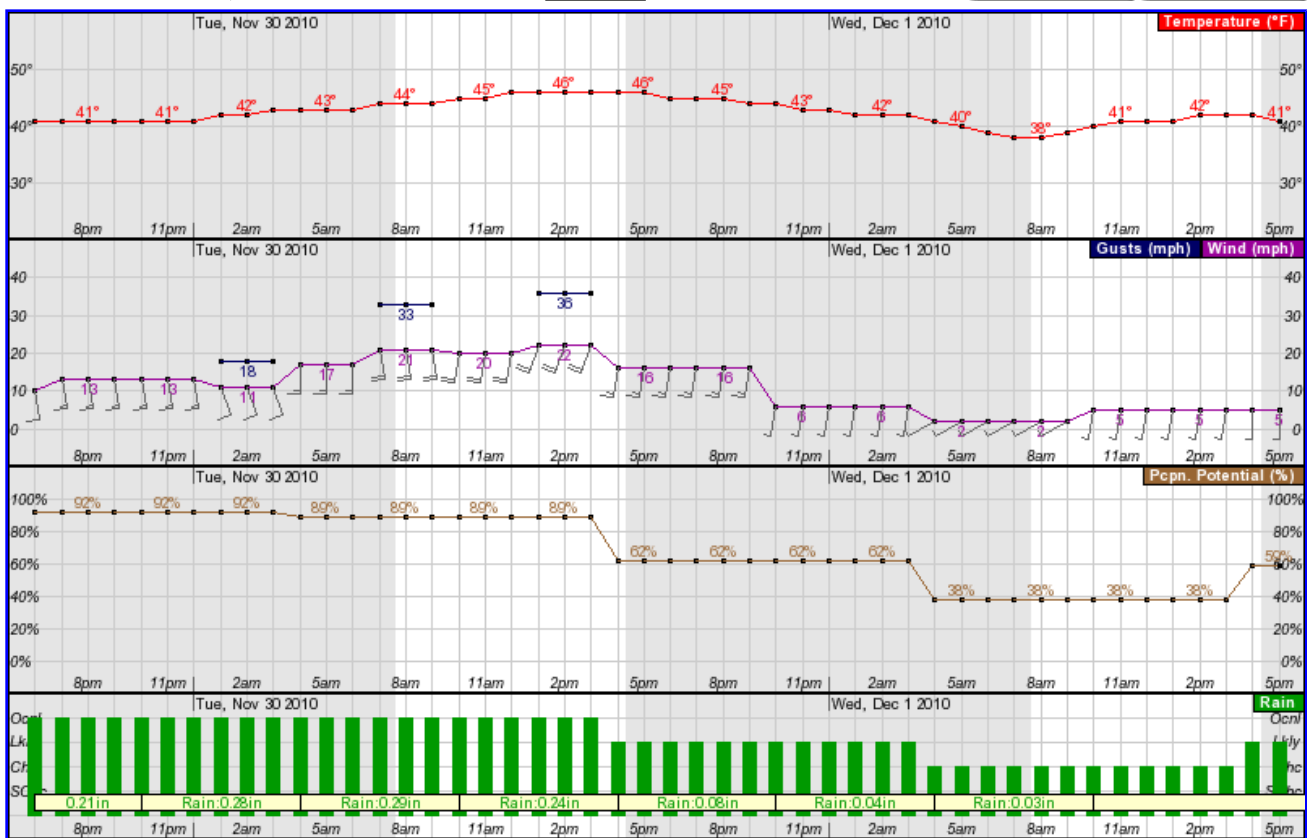
Search for: ☒ NWS ☐ All NOAA

Last Update: 3:12 pm PST Nov 29, 2010

Hourly Weather Forecast Graph

[\[dashes/dots\]](#) [\[b/w\]](#) [\[hide menu\]](#)

Weather Elements		Weather/Precipitation
<input checked="" type="checkbox"/> Temperature (°F)	<input checked="" type="checkbox"/> Surface Wind <input type="text" value="mph"/>	<input type="checkbox"/> Thunder
<input type="checkbox"/> Dewpoint (°F)	<input type="checkbox"/> Sky Coverage	<input checked="" type="checkbox"/> Rain
<input type="checkbox"/> Wind Chill (°F)	<input checked="" type="checkbox"/> Precipitation Potential	<input type="checkbox"/> Snow
	<input type="checkbox"/> Relative Humidity	<input type="checkbox"/> Freezing Rain
		<input type="checkbox"/> Sleet

48-Hour Period Starting: 

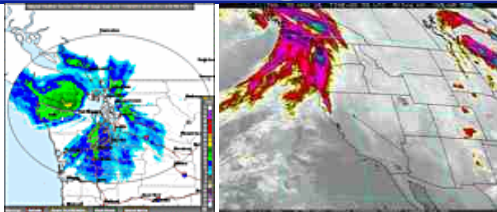
Tuesday, November 30 at 7am

Temperature: 44 °F Surface Wind: S 21G33mph

Precipitation Potential: 89%

Rain: Occasional (80%-100%)

Radars and Satellite Images



Additional Forecasts & Information

[International System of Units](#)[Forecast Discussion](#)[7-Day Forecast](#)[Tabular Forecast](#)[Quick Forecast](#)

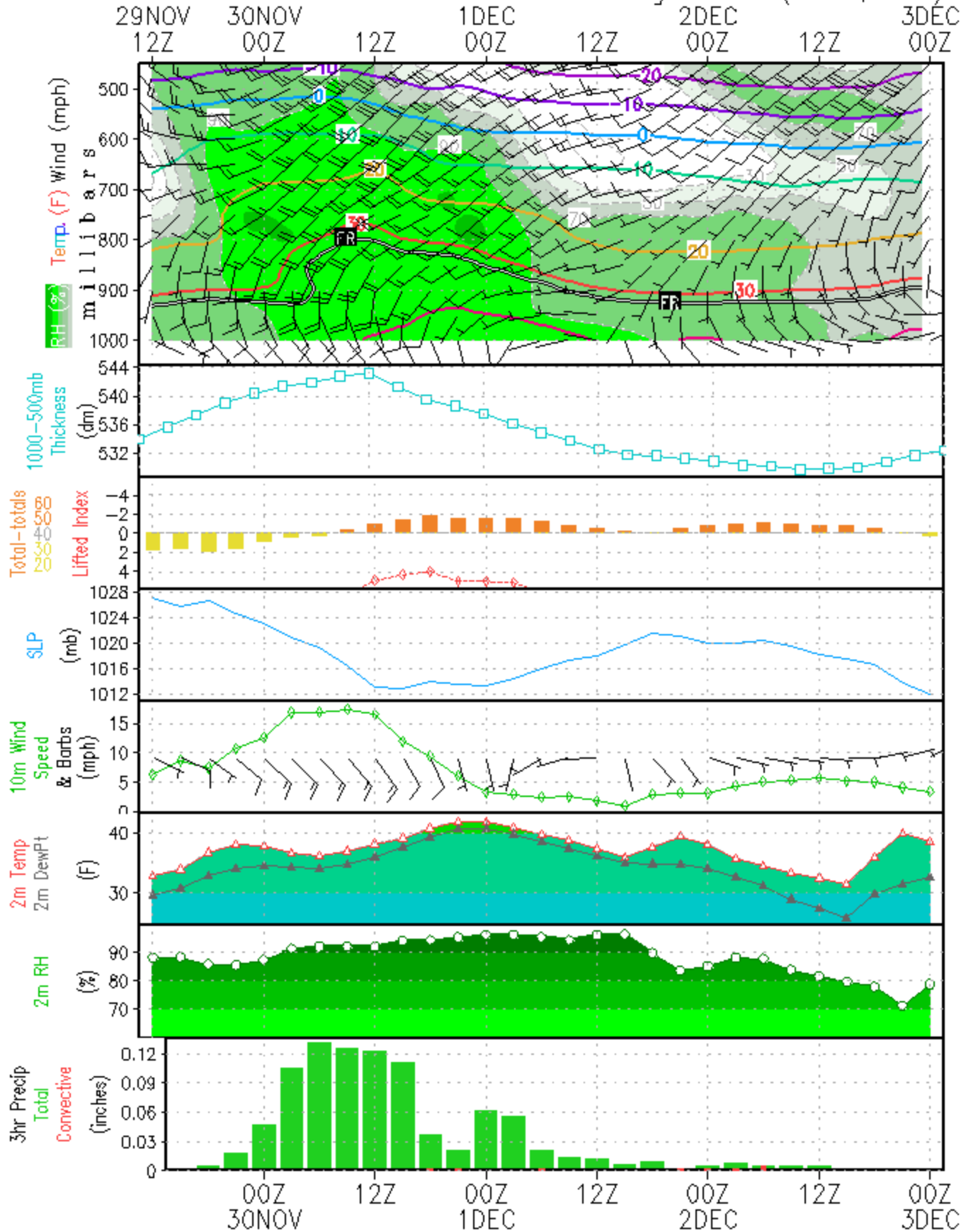
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NOAA's National Weather Service
Seattle, WA

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NAM 0-84hr Forecast Meteogram for (123W, 48N)





STORM EVENT REPORT #3
For
Non-Dry Dock Stormwater Monitoring
Conducted at
Puget Sound Naval Shipyard
Bremerton, WA
Project ENVVEST Study Area

December 11, 2010



Puget Sound Naval Shipyard and Surrounding Area

PNNL Contract No.: N4523A10MP00034 Amendment 1



1.0 Introduction

Taylor/TEC conducted non-dry dock stormwater sampling tasks within the Puget Sound Naval Shipyard (PSNS) – Project ENVVEST study area between December 10th and 12st, 2010. This was the third storm event (STE) of the 2010-2011 project sampling season. A summary of the events and conditions that occurred during STE#3 are presented in this report, with supporting information as attachments.

This STE Report contains: 1) a list of the Taylor/TEC and Navy staff that participated in the event and their base roles; 2) details regarding storm event preparatory tasks; 3) weather forecast information and targeting details; 4) a precipitation and event qualification summary; 5) a sampling information, management and validation discussion; 6) basin runoff calculations; 7) descriptive statistics and discussion of the event station monitoring data; 8) notable anomalies and variations to the PWP; and 9) action items.

Attachments containing weather forecast information, field sampling / sample processing forms, COC forms, station hydrographs and autosampler reports are also included in this report.

2.0 Project Staff Participating in the STE

Taylor/TEC & PNNL / MSL Personnel:

Dave Metallo – Project Manager (Taylor/TEC), Storm Controller, Field Event and QC Manager

Brian Rupert – Field Team Leader

Jill Brandenberger – Project Manager (PNNL/MSL), Project Chemist, Field Team Member

Navy Personnel:

Bruce Beckwith – Navy Program Manager, Field Team Member

Bob Johnston – Project Technical Lead / Oversight, Navy Field Team Leader

3.0 Storm Event Preparatory Tasks

On Friday December 10th, 2010 reset and setup tasks (see Sections 1 and 2 of the attached *Stormwater Field Sampling Forms*) were conducted by the Taylor/TEC team at all four of the current monitoring stations (PSNS 81.1, PSNS82.5, PSNS096 and PSNS126). Additional rain gauge maintenance was also performed at all monitoring stations. All of the stations were deemed to be functioning properly, operational and “sample ready” at the completion of the reset tasks.

All stations were programmed with pre-determined autosampler enable and pacing conditions set “high” (to prevent premature enabling) (*sample disable mode*), as directed by the Taylor/TEC Storm Controller. Station operations were ready to be managed via telemetry by the Storm Controller.

Of note PSNS096 was configured using the conductivity “repeatable enable” function. Based on observations from the past two STE’s, it was observed that PSNS096 collected a majority of its bottles filled with non-qualifying high-conductivity water. The repeatable conductivity enable was employed to help disable the sampler during periods when high conductivity water existed in the vault and thus attempt to limit collection to only those periods when non-tidally impacted runoff was occurring. Figure 1 shows the general location of the monitoring stations at the PSNS.

4.0 Weather Forecast Information and STE Targeting Details

Since completing sampling for STE#2 there had been 2.72” of rainfall at the Shipyard (as measured by the PSNS gauge at B427) between November 30th (2205) and December 11th (1100). The majority of this rainfall, 2.39”, fell between December 7th and 9th, with only and additional 0.32” falling before the start of STE#3 (approximately 1100 on the 11th).

On December 10th the National Weather System (NWS) forecast for the Bremerton area was once again promising, with a “very wet and hydrologically significant” rain event predicted for the 11th and 12th. The routinely referenced weather models used to gain forecast information in the Pacific Northwest, the MM5-NAM (<http://www.atmos.washington.edu/mm5rt/rt/naminit.12km.html>) and the GFS-WRF (<http://www.atmos.washington.edu/mm5rt/rt/gfsinit.frame1.html>) (both hosted by the University of WA and initialized for the PNW) were in fairly good agreement with each other for this storm event.

Both models showed consistency in their predication of heavy rain developing over the area with an approaching strong warm front; although the GFS shows the bulk of the rain further to the northern portion of the forecast area then the NAM. The NWS forecast called for rain over the entire forecast area by evening (of the 11th) and had issued a flood watch for the entire area as well. The forecast described a baroclinic condition (very unstable frontal boundary between differing air masses spurred on by misalignment of pressure, temperature and density gradients – common with mid-latitude cyclonic weather patterns) setting up in relation to the approaching, and subsequent collision, of the warm and cold fronts over the area. This system was also forecasted to produce strong gusty southerly winds over the interior of the Puget Sound and Hood Canal areas as the baroclinic stalls over the area – until finally clearing with as the cold front pushes northward through the area on the afternoon of the 12th.

The forecasted precipitation probability was between 97-99% for approximately 1.89” depth or greater event (the NWS called for up to 3.5” in some areas). The system setting up over the region was forecast to spread rain throughout the Puget Sound lowlands by early afternoon of the 11th and become heavy between 1800 and 0600 on the 12th – gradually tapering off by early evening of the 12th. The area weather was forecasted to become colder and remain unsettled with periods of rain through Wednesday (December 15st) with possible drying for later in the week. Detailed weather information is provided in the Attachment section of this report.

Once the field crew reported the completion of their site preparatory tasks on the 10th the Taylor/TEC Storm Controller took command of station operation via telemetry. The station status was checked at 2200 on the 10th – no rain reported at any of the stations within last 6 hours. The antecedent dry period had been met for all stations, with all of the 24-hour rain totals at 0.01 (PSNS096) or less. However, the 0.01” measured at PSNS096 occurred around 1230 on the 10th which was very likely a bucket “tip” caused during rain gauge maintenance activities.

Subsequent weather and station checks on the morning of December 11th revealed the formation of the approaching storm and spread of rain over the Shipyard. With a check to ensure a qualifying antecedent dry period had been met, the enable condition switches at each monitoring station were turned on (*sample ready mode*). Table 1 lists the monitoring station enabling conditions that were used for STE#3.

A check of the monitoring stations at approximately 1430 revealed that all four had enabled between 1303 (PSNS126) and 1404 (PSNS096). PSNS82.5, PSNS126 and PSNS096 had enabled after between 0.11” and 0.12” of rainfall occurred at these stations. PSNS096 enabled after 0.17” of rainfall. This greater rainfall enabling depth amount was noted during past STE’s. Its cause is perhaps a consequence of the slope of the piping system at this location; not allowing the water level in the vault to attain the expected runoff response, coupled with the station’s moderately high effective tide height (8.6’ MLLW). A check of each station’s vault water level and hydrograph stage (see attached) showed that all were elevated above base flow conditions at the initiation of composite sampling (composite sample enable). *Storm Controller notes*, which provide additional details, are attached to this report.

Table 1. Monitoring Station Enabling Conditions

Station	Rainfall (in/hr)	Level (ft)	Conductivity (µS/cm)	Repeatable Conductivity Enable (Y/N)	Pacing (min)	¹ Antecedent Period (24hr/6hr)
PSNS81.1	0.03	0.20	2000	N	15	0” / 0”
PSNS82.5	0.03	0.15	2000	N	15	0” / 0”
PSNS096	0.03	0.20	2000	Y	15	0” / ² 0.01”
PSNS126	0.03	0.20	2000	N	15	0” / 0”

¹Antecedent condition as checked b/w 0730 and 0930 on 12/12/10

²PSNS096 rain gauge recorded 0.01” rain at 1300 on 12/10 – this is attributed to maintenance / setup activities

5.0 Precipitation and STE Qualification Summary

Precipitation Summary:

The previous rain event to cause runoff (≥ 0.03” rainfall without 6-hr gap) prior to the onset of STE#3 ranged from 1:12:25(Days:Hours:Minutes) at PSNS81.1 to 1:13:05 at PSNS096, as measured by each stations rain gauge. As predicted, rain began to fall on the project site between

approximately 1030 (PSNS81.1) and 1105 (PSNS096 and 126) on December 11th. Light to moderately heavy rain fell from the onset of the STE until about 2100 on the 11th, with all stations recording about 0.7 to 0.9" of rain. Between 2100 and 0900 on the 12th the rain intensity increased by 2.5 to 3 times. During this period the stations reported between 2.8 and 3.6" of rainfall. However, rain was steady throughout the entire event. The storm sharply tailed off and ended after 100 on the 12th. The storm duration ranged from about 24 (PSNS126) to 26 (PSNS81.1) hours.

Table 2 summarizes the rainfall amounts that occurred during the sampling period for each monitoring station as well as the PSNS rain gauge at B427 and the overall storm event depths measured at each station. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), attached to this report, provides additional storm event and sampling period rainfall information.

Table 2. Rainfall Totals for PSNS Gauge and Monitoring Stations

Station	¹ Rainfall During Heavy Period (in)	% of STE Rainfall Occurring During Heavy Period	Sampling Period	Sampling Period Rainfall (in)	% Rainfall During Sampling Period vs. STE Period	Total Storm Event Rainfall (in)
B427	3.96	83	NA	NA	NA	4.79
PSNS81.1	2.83	79	12-11 (1320) – 12-12 (1304)	3.45	97	3.57
PSNS82.5	3.53	80	12-11 (1307) – 12-12 (1251)	4.33	98	4.44
PSNS096	3.59	80	12-11 (1402) – 12-12 (1209)	4.29	96	4.47
PSNS126	2.87	77	12-11 (1301) – 12-12 (1245)	3.62	98	3.71

¹As defined above as the period from approximately 2100 on 12/11 to 0900 on 12/12/2010.

STE Qualification Summary:

All storm qualification conditions were met for this event. Storm event qualification conditions included wet season event date range (Oct 1 – May 1), forecast probability ($\geq 70\%$), antecedent dry period (≤ 0.1 " rain in previous 24hrs and 0" rain in previous 6hrs), forecasted storm depth (≥ 0.1 "), storm duration (≥ 2 hrs) and runoff occurrence / hydrograph stage (elevated above base flow). Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), documents the particular STE qualification listed above.

6.0 Sampling Information, Management and Validation

Grab Sampling:

Grab sample collection was performed by the Navy Team, with storm control assistance (limited to station status checks via telemetry) from Taylor/TEC as necessary. Grab sampling was conducted at all four of the current monitoring stations. Grab samples were collected as per the 201-11 Project Work Plan (PWP). Water quality condition (conductivity and temperature) was assessed prior to the collection of the samples. Samples were collected only if conductivity was determined to be ≤ 2000 $\mu\text{S}/\text{cm}$. Samples were collected using manual methods; a laboratory cleaned stainless steel dip cup, lowered on an extension pole, used to fill the appropriate analytical containers. Parameters included total petroleum hydrocarbons (NW-TPH-Dx) and fecal coliform. All samples were collected on December 12th between 1407 (PSNS82.5) and 1540 (PSNS81.1). Sample collection was coordinated with low or lower tidal conditions to ensure that proper conductivity conditions would exist. Grab sampling times are indicated on the attached hydrographs to illustrate the water level stage during collection. Grab sample IDs, along with the other pertinent information is listed in the *Stormwater Field Sampling Forms* and in Table A-1 (both are attached). Table 3 summarizes these results.

Table 3. Grab Sampling Details

Sample Collection Criteria:	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Grab sample ID	SW03-001	SW03-002	SW03-004	SW03-003
Grab Date /Time	12/12/2010 14:35	12/12/2010 14:50	12/12/2010 14:07	12/12/2010 15:40
Grab sample conductivity value ($\mu\text{S}/\text{cm}$)	540	289	126	56.6
Hydrograph stage at grab collection	base of falling limb	falling limb	post storm runoff	falling limb
Grab parameters collected per PSNS PWP?	Yes	Yes	Yes	Yes

Composite Sampling:

Composite sample retrieval tasks and formulation procedures were managed by Taylor/TEC with support from PNNL/MSL personnel. Composite samples were collected from all four of the current monitoring stations.

Composite samples were collected via autosamplers which were operated and synchronized by a custom designed telemetered water quality control system. The composite collection period ranged from December 11th 1303 at PSNS126 to 1304 at PSNS81.1 on the 12th. Methods used in preparation, autosampler collection, retrieval and formulation of the composite samples were

conducted as per the PWP. Discrete time-paced samples were collected in 1000-ml plastic wedge bottles (up to 24 bottles available in each autosampler base) at a rate of 240-ml / 15 minutes (four samples/bottle, one bottle/hour) per aliquot; which, at this pacing, provides for up to 24 hours of sampling period coverage. Samplers at each station were enabled as per the conditions stated in Section 4 of this report. Each station was outfitted with either a pressure transducer (level and temperature) / conductivity (with salinity post-calculated) probe combo (INW CT2X) (PSNS081.1, PSNS096 and PSNS126) or a pressure transducer (level and temperature) (Campbell CS450) and a multi-parameter sonde (conductivity, salinity and temperature) (YSI6820) (PSNS82.5).

The discrete samples from each station (contained in the autosampler base) were brought back the C106 Stormwater Lab at B147 for processing. Composite formulation occurred on December 12th between 2000 and 2300. Each individual discrete sample was screened with a bench-top meter (YSI 30) for its conductivity value. Bottles with values ≤ 2000 $\mu\text{S}/\text{cm}$ were considered for inclusion in the overall composite sample; bottles testing greater than 2000 $\mu\text{S}/\text{cm}$ were discarded. Composite formulation followed the procedures as detailed in Section 8.2.5 of the PWP. Based on this screening criterion all discrete bottles from all of the stations qualified for use in their stations overall composite same. It was also noted that no aliquots were missed at any of the stations. As mentioned above, the repeatable enable (conductivity) function was utilized at PSNS096; for the first time during the project. This feature was used to help preferentially screen highly saline water from being sampled. The feature functioned as designed, only permitting sample collection at qualifying conductivity concentrations. Consequently only 83 of a potential 96 aliquots were collected over the span of 21 out of a possible 24 discrete bottles. This can be noted on the hydrograph (attached) for PSNS096.

Composite samples parameters included: hardness, TOC, DOC, TSS, total and dissolved metals and turbidity. A small portion from each of the composite samples was poured off for the assessment of overall conductivity value. Results of the composite formulation, bench top testing results, as well as sample IDs, sample date/time and resultant overall conductivity values, are detailed in the *Stormwater Field Sampling Forms* and in Table A-1 (both are attached). Table 4 summarizes these results.

Table 4. Composite Sampling Details

Sample Collection Criteria:	PSNS126	PSNS096	PSNS082.5	PSNS081.1
Composite sample ID	SW03-0006	SW03-0008	SW03-0009	SW03-0010
Composite Date /Time	12/12/2010 12:45	12/12/2010 12:09	12/12/2010 12:51	12/12/2010 13:04
Overall Composite conductivity value (μS/cm)	289	80	79	100
Composite volume (ml)	9500-9900	5000	8040	8000
Composite parameters collected per PSNS PWP?	Yes	Yes	Yes	Yes

All sampling and vault monitoring equipment operated as designed and programmed. Details pertaining to autosampler programming and event-specific operation of each monitoring station autosampler unit are contained in the attached *Sampler Reports*.

QC Samples:

Duplicates for both grab and composite sample portions were collected during STE#3. Methods and procedures for the collection of these quality control samples were completed in accordance with Section 10.1 of the 2010-11 PWP. A grab sample duplicate was collected at PSNS82.5 and a composite sample duplicate was collected at PSNS126. The *Stormwater Field Sampling Forms* and Table A-1 (both attached) contain details regarding the QC Samples associated with STE#3. Table 5 summarizes the quality control sample collection information for STE#3.

Table 5. Summary of Quality Control Sampling Information

Sample Collection Criteria:	PSNS126	PSNS82.5
Grab sample duplicate ID	N/A	SW03-005
Grab sample duplicate date and time	N/A	12/12/2010 14:14
Grab sample duplicate conductivity value (μS/cm)	N/A	126
Composite sample duplicate ID	SW03-0007	N/A
Composite sample duplicate date and time	12/12/2010 12:45	N/A
Was additional volume collected for MS/MSD analysis (grab, comp or both)?	No	No
Overall Composite Duplicate conductivity value (μS/cm)	72	N/A
Composite Duplicate volume (ml)	9500-9900	N/A

Sample Management:

All samples were handled and managed as per Section 9 of the PWP and in a manner acceptable and within industry standards regarding practices typical for tasks of this nature. Once collected, both grab and composite samples were placed into coolers and put on ice and/or into the Stormwater Laboratory refrigerator to maintain temperatures between 2 and 6 °C.

All sample IDs, collection date and time, matrix, requested parameter analysis and other associated information were documented on *Chain-of-Custody (CoC) forms* (attached). Samples were in direct control of project and/or laboratory personnel at all times. Samples were delivered to the testing facility, Battelle Marine Science Laboratory in Sequim, WA, in good, useable and properly chilled condition. Adequate sample volume was collected from the targeted stations to proceed with the scheduled analysis of all parameters per the 2010-11 PWP.

Sample Validation Summary:

All sample validation criteria were met for this event per Section 8.2.6 of the 2010-11 PWP. Prior to processing the samples and transferring custody to the analytical laboratory, the Taylor/TEC Field Event Lead validated the samples against certain criteria. These validation criteria included runoff occurrence / hydrograph stage, sample preparation and handling review, requested parameters, ≥2 hour sampling duration or 75% storm hydrograph coverage, minimum number of aliquots, minimum sample volume collected for required parameters, discrete and composite samples conductivity measurement results, quality control sample collection and anomalous conditions assessment. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), documents the particular STE qualification listed above.

7.0 Basin Runoff Calculations

Rainfall runoff volumes were calculated for each of the basins associated with the current monitoring stations. These calculations are based on the Runoff Coefficient Method as described in Section 7.4 of the 2010-11 PWP. Table 6 summarizes the results from these calculations.

Table 6. Monitoring Station Runoff Volume Calculations

Station	Combined Drainage Area (Ft ²)	STE Rain Total (In)	STE Rain Total (Ft)	STE Runoff Vol. (Gal)	Sample Event Rain Total (In)	Sample Event Rain Total (Ft)	Sample Event Runoff Vol. (Gal)	% of Runoff Sampled During STE
PSNS126	591,881	3.71	0.3092	1,368,859	3.62	0.3017	1,335,652	98%
PSNS096	635,317	4.47	0.3725	1,770,307	4.29	0.3575	1,699,019	96%
PSNS082.5	82,764	4.44	0.3700	229,074	4.33	0.3608	223,398	98%
PSNS081.1	849,074	3.57	0.2975	1,889,575	3.45	0.2875	1,826,060	97%

8.0 Descriptive Statistics and Discussion of the Event Station Monitoring Data

Descriptive statistics for the sampling period at each monitoring station are provided in Table 7, below. These statistics include minimum, maximum, average and median for 5-minute interval rainfall data, vault level, conductivity, salinity, transducer water temperature, YSI water temperature (PSNS82.5 only) and tidal stage. Sampling period rainfall totals, as well as maximum 1-hour intensity and average 1-hour intensity (includes intra-event dry periods) are also included as part of each station's rainfall information.

Table 7. Sampling Period Rainfall and Vault Parameter Descriptive Statistics

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (μ S/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
PSNS81.1 min	0			0.17	6.78	2.00	7.01		2.10
max	0.04			10.54	2231.60	2.00	13.09		12.20
average	0.012			4.64	44.31	2.00	10.01		7.14
median	0.01			4.06	15.22	2.00	10.45		7.10
total	3.45	0.34	0.145						
PSNS82.5 min	0			0.21	20.00	0.01	5.70	5.78	2.10
max	0.05			5.20	1380.00	1.06	11.16	11.24	12.20
average	0.015			1.20	38.36	0.03	8.28	8.36	7.13
median	0.010			0.39	26.00	0.02	7.46	7.58	7.05
total	4.33	0.45	0.182						
PSNS096 min	0			0.60	12.25	2.00	7.34		2.10
max	0.05			10.82	55935.00	42.00	12.83		12.20
average	0.016			5.12	4353.24	5.60	10.19		7.10
median	0.010			4.49	37.83	2.00	10.18		6.90
total	4.29	0.45	0.194						
PSNS126 min	0			0.10	10.84	2.00	6.70		2.10
max	0.04			5.30	618.42	2.00	12.60		12.20
average	0.013			1.26	70.40	2.00	9.87		7.13
median	0.010			0.39	27.21	2.00	10.22		7.05
total	3.62	0.37	0.153						

¹salinity calculation for PSNS81.1, 096 and 126 is based on an algorithm that has a lower range cut-off value of 2ppt. Actual field values may have been lower. PSNS082.5 used a conductivity probe (YSI6820) that utilized a different salinity algorithm function and thus is able to calculate lower low range salinity values.

The hydrographs (see attached) for all four monitoring stations showed continuous rain throughout both the sampling and storm periods; moderate from about 1030 to 2100 on December 11th, then intensifying 2.5 to 3 times until nearly the end of the storm event at approximately 1100 on the 12th.

The initial level response at each station was actually in decline even through approximately 0.15" of rainfall until the tide stage receded beyond the effective (tidal) level at each station. After this the amount of rain became the overriding factor in the hydrographs, and although pipe storage effects (the corresponding rise and fall of the vault water level with the tide stage as rain water essentially becomes "stored" in the piping system) are noted at each station, the conductivity values indicate that a freshwater state dominated the remainder of the sampling/storm period. The pipe storage effect is mainly governed by rainfall intensity, rainfall duration, tide stage and each stations effective tide height (the tidal stage required, at non-rainfall periods, to impact the sampler line intake). However, at PSNS82.5 the added influence of the Tideflex® valve at the terminus of the outlet line for RMTS area causes a level hydrograph with sharp rising and falling limbs, indicating filling and flushing as the valve open and closes. This effect has been previously noted during past STE's. Another item of note is that the large rainfall depth associated with this STE was enough to even overcome the low effective tide level at PSNS096 (2.94').

All of the grab samples were collected at the end of the storm event when rainfall had ceased. However, all grab samples were collected either on the falling limb of the station hydrograph or while there was elevated freshwater runoff occurring (as evidence by low conductivity/salinity values). Sample marker and grab sampling indications have been applied to the hydrographs (see attached).

Telemetry System Metadata:

All of the monitoring stations were operating without incident by the start of STE#3. None of the stations, except PSNS096, had any data collection issues. An excerpt from the PSNS096 metadata file (separate submission) is provided below:

16-18 Nov, 22-26 Nov, 15-16 Dec and 10 Jan various times - Salinity recorded as "not a number" (dropped out). Salinity data experience various bouts of "drop-out" during the dates indicated above. The causes for this were either negative conductivity values used for salinity calculation, maintenance periods or for a few instances were unexplainable. However, during all of these salinity problem periods conductivity functioned (properly).

A review of the telemetry data collected during STE#3 indicated that there were no issues with any of the vault or rain gauge sensors.

9.0 Notable Anomalies and Variations to the PWP

There were no anomalies observed that would have otherwise caused any of the STE#3 samples to be non-representative of the conditions from which they were collected. As reported above, all intended and scheduled grab and composite samples were submitted to the MSL within holding

times and without incident. All support and sampling tasks, as well as collected samples, were managed as appropriate per the PWP.

One minor discrepancy was noted between the listing of the grab and grab duplicate samples on the COC and what was listed on the field forms. The correct time for the grab and grab duplicate samples is 1407 and 1414 (December 12th), respectively. Since this discrepancy did not adversely affect sample's quality, analysis, data management or other project considerations it was left as is and duly noted here for reference.

10.0 Action Items

This was the third of three scheduled storm events at the current monitoring stations. Therefore, the project plan calls for relocating monitoring equipment to at least three new locations, while possibly maintaining operations at one of the current stations. Near term action items include meeting with the project team to discuss the plan for station relocation. Once a decision is made regarding the station move, including what station may maintain its current operation the following items would likely be undertaken; demobilization of stations slated for re-location, equipment/sensor cleaning and calibration, new station setups (vault infrastructure, housing placements, etc.), reconfiguring the telemetry system for their new positions, re-installation of sensors, rain gauges and samplers, field test the monitoring systems at the new sites, collection of equipment blanks and other required QC samples prior to STE sample collection and finally completing the routine station items normally conducted for storm preparation and post-event resets.

The current focus of the field efforts will be to determine monitoring station relocation particulars and preparing for the remainder of the upcoming scheduled storm events.

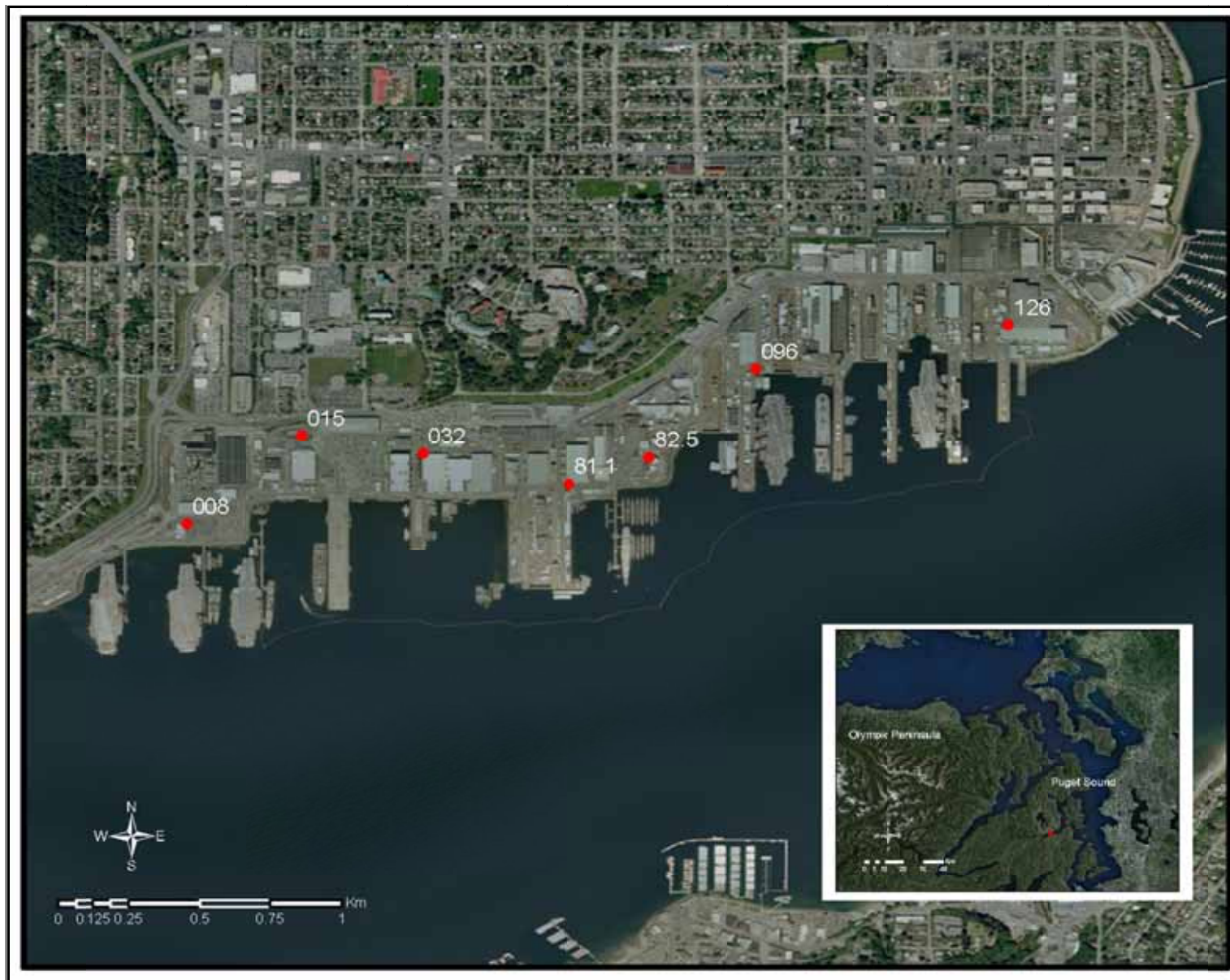


Figure 1. Stormwater Monitoring Locations within the Shipyard Boundary

ATTACHMENTS

- Storm Qualification and Sample Validation Information Checklist
- Stormwater Field Sampling Forms and Controller Notes
- Chain-of-Custody Forms
- Runoff Calculation Worksheet
- Station Hydrographs
- Autosampler Reports
- Weather Forecast Information

Table A-1.PSNS Non-Dry Dock Stormwater Monitoring Tasks
Storm and Sample Information and Validation Checklist
Stormwater Sampling Event #3 (12/11/10)



*This form acknowledges representativeness criteria described in the project PWP.
 Mark with "Yes" to acknowledge acceptable, "No" for not acceptable, "NA" or "-" if not applicable.*

¹ Storm Event Data:					
Project Storm Event (STE) #	3				
Event Forecast Probability (%)	97-99%				
PSNS C106 Rain Gauge - Storm Event Total (in.)	4.79				
Rainfall and Runoff Summary:		PSNS126	PSNS096	PSNS082.5	PSNS081.1
Last Runoff (≥ 0.03" rainfall without 6-hr gap) Prior to STE Start (days:hrs:min)	1:13:00	1:13:05	1:12:30	1:12:25	
Antecedent Dry Period (days: hrs: mins)	1:13:00	23:00	1:12:30	1:12:25	
Rainfall Prior 24-hrs to Sampling Start	0.00	0.01	0.00	0.00	
Rainfall Prior 6-hrs to Sampling Start	0.00	0.00	0.00	0.00	
STE Start Date & Time	12/11/10 11:05	12/11/10 11:05	12/11/10 10:35	12/11/10 10:30	
STE Duration (days: hrs: mins)	24:20	26:10	25:30	26:20	
STE End Date & Time	12/12/10 11:25	12/12/10 13:15	12/12/10 12:05	12/12/10 12:50	
Period Between Next Measureable Rain (days: hrs: mins)	26:50	26:00	12:20	25:30	
Storm Event Total Rainfall (in)	3.71	4.47	4.44	3.57	
Storm Event Max 1-hr Rainfall Intensity (in/hr)	0.33	0.43	0.42	0.34	
Storm Event Average 1-hr Rainfall Intensity (in/hr)	0.152	0.171	0.174	0.136	
Sampling Period Total Rainfall (in)	3.62	4.29	4.33	3.45	
Sampling Period Max 1-hr Rainfall Intensity (in/hr)	0.37	0.45	0.45	0.34	
Sampling Period Average 1-hr Rainfall Intensity (in/hr)	0.153	0.194	0.182	0.145	
Runoff volume calculated for entire storm period (gallons)	1,368,859	1,770,307	229,074	1,889,575	
Runoff volume calculated for sampling period (gallons)	1,335,652	1,699,019	223,398	1,826,060	
Percentage of total storm runoff utilized during sampling period	98%	96%	98%	97%	
¹ Sample Collection Criteria:		PSNS126	PSNS096	PSNS082.5	PSNS081.1
Grab sample ID	SW03-001	SW03-002	SW03-004	SW03-003	
Grab Date /Time	12/12/2010 14:35	12/12/2010 14:50	12/12/2010 14:07	12/12/2010 15:40	
Grab sample conductivity value (µS/cm)	540	289	126	56.6	
Hydrograph stage at grab collection	base of falling limb	falling limb	post storm runoff	falling limb	
Grab parameters collected per PSNS PWP ?	Yes	Yes	Yes	Yes	
Composite sample ID	SW03-0006	SW03-0008	SW03-0009	SW03-0010	
Composite Date /Time	12/12/2010 12:45	12/12/2010 12:09	12/12/2010 12:51	12/12/2010 13:04	
Overall Composite conductivity value (µS/cm)	289	80	79	100	
Composite volume (ml)	9500-9900	5000	8040	8000	
Composite parameters collected per PSNS PWP ?	Yes	Yes	Yes	Yes	
¹ QC Sample Summary Information:		PSNS126	PSNS096	PSNS082.5	PSNS081.1
Grab sample duplicate ID	N/A	N/A	SW03-005	N/A	
Grab sample duplicate date and time	N/A	N/A	12/12/2010 14:14	N/A	
Grab sample duplicate conductivity value (µS/cm)	N/A	N/A	126	N/A	
Composite sample duplicate ID	SW03-0007	N/A	N/A	N/A	
Composite sample duplicate date and time	12/12/2010 12:45	N/A	N/A	N/A	
Was additional volume collected for MS/MSD analysis (grab, comp or both) ?	No	N/A	No	N/A	
Overall Composite Duplicate conductivity value (µS/cm)	72	N/A	N/A	N/A	
Composite Duplicate volume (ml)	9500-9900	N/A	N/A	N/A	
¹ Storm and Sample Validation:		PSNS126	PSNS096	PSNS082.5	PSNS081.1
Was the targeted STE antecedent qualified per PSNS PWP? (if no, then see next line)	Yes	Yes	Yes	Yes	
Was the antecedent overage amount greater than 10% of the total rain event ?	N/A	N/A	N/A	N/A	
Was runoff occurring OR was the hydrograph at least 10% above background pipe level during grab collection ? If no, explain in summary narrative.	Yes	Yes	Yes	Yes	
Were a minimum of 8 aliquots collected OR does the composite sample represent at least 75% of the stations storm event rain volume ?	Yes	Yes	Yes	Yes	
Were all 1-hr sampler bottles used for the Composite sample ≤2000 µS/cm ?	Yes	Yes	Yes	Yes	
Did any anomalous conditions exist that could make samples non-representative? Explain if "Yes"	No	No	No	No	
Based on consideration of the information above, was the sample collected during the STE valid for project purposes ? (Y / N, composite, grab or both)	Yes - both	Yes - both	Yes - both	Yes - both	

¹ If the answer to any of these questions is "No" OR indicate non-representative conditions, then these items should be explained in the Event Narrative.

Validation Check List Completed By / Date: Dan O'Brien Reviewed By / Date: Steve Metello 1-28-11



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

ver.111510

Station: 81.1	MH/CB#: SD-1	Loc. Descrip. South side B462.	Page: 1 of 2
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pages per station

Section 1. Station Reset and Inspection			
Personnel: DM/BR	Weather: Partly Sunny, 40°s, lt. breeze	Arrival Date/Time: 12-10-2010 (1500)	
Carry-over maintenance to do prior to set-up:	Replace battery, charged @ batt. shop		done? Y
Sampler Battery Voltage		Changed? Y N	New voltage 12.90
Modem Battery Voltage	13.86 PM 13.76	Changed? Y (N)	New voltage —
Sample Tubing & Strainer OK?		Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	+1 min
Trans. Cable OK?	Yes	Internal Sampler Tubing OK?	Yes
Trans. Desiccant OK (Yes/No)	No - dried	Tubing Replaced? (Yes/No)	No
Telem. Box Desiccant OK (Yes/No)	Yes	Normal Smlr Program or Dup. ?	Normal
Modem Status	OK	Bottles Loaded ?	Yes
Notes (including channel condition): Rain Gauge Ch: level = good, throat: clear		Lid Status?	OFF 12-10-10
		Backflushed with DI?	
		Suction line & quick connect attached?	
		Smlr Status (on/off) / last screen..	See below

Section 2. Storm Setup and Inspection			
Personnel: DM/BR	Weather: See above	Arrival Date/Time: See above	
Sampler Battery Voltage		Changed? Y N	New voltage 12.90
Modem Battery Voltage	13.76	Changed? Y (N)	New voltage —
Sample Tubing & Strainer OK?	Yes	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	+1 min
Transducer Cable OK?	Yes	Aliquot Vol. Cal'd (Y/N & vol.)	Yes 240 ml
Multi-meter Cable OK	NA	Program Reviewed (Yes/No), Dup ?	Yes Normal
Recorded Level (FT)	3.14'	Lids off bottles?	Yes
Measured Level (FT)	3.11'	Diagnostics/Distributor arm check?	Yes
Offset Diff (FT)	0.03'	Backflush with DI?	Yes - 1 gal
Level Adjusted ?	Yes, offset = 0.13	Storm Reset (1, enter) Completed	Yes
Cond. Sonde Type (YSI6820 or INW-CT2X)	CT2X	Last screen...	Prgm Disabled 15:39 Fri 12-10-10...
Cond. Sonde Cal. Info. : Recorded Val. = 44738 Meas. Val. = — Diff. = — (>10% adj. offset); Offset = — New Rec Val = — (1539)			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) No cond. cal. conducted Enable cond.s = R@0.03"/hr, L = 0.2', C = 2000 uS/cm			

Section 3. Grab Sample Collection			
Personnel: Johnston/Beckwith	Weather:	Arrival Date/Time: 12/12/10 1538	
On Composite... (Bottle #/ Aliq #)	Prgm Completed	Composite Begin Time (date / time)	12-11-10 (1320)
Grab Parameters Collected	TPH/FC	Y	
Grab Sample ID	SW03-003	Conductivity Reading (what meter?)	56.6 uS
Grab Date/Time	12/12/10 1540	Grab MS/MSD Collected ?	15.7 C
Grab Dup ID	NA	Equipment running correctly?	Yes
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	Mid-12's
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: OK			
Storm Controller notified (Y or N/A)?:	Y	Ice OK?	NA
Notes: Program for SW03.1 is done Two bottles for TPH FC sample & FC dup			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Page: 2 of 2Station: 81.1 continued from previous page

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM/BR</u>	Weather: <u>overcast, 40's</u>	Arrival Date/Time: <u>12-12-10 (1915)</u>	
Sampler Battery Voltage	<u>---</u>	Changed? Y N <u>Pulled</u>	New voltage <u>---</u>
Telemetry Battery Voltage	<u>Mid-12's</u>	Changed? Y (N)	New voltage <u>---</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>12-11-10 (1320)</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>12-12-10 (1304) BTL #24 4/4</u>		
Total Composite Sample Volume Collected	<u>24 1-L wedge bottles</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>NONE</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK</u>			
Storm Controller notified (Y or N/A)?	<u>NA</u>	Which parameter?:	<u>NA</u>
Notes: <u>All btl's equally filled, w/ no over filling noted</u>			
Maintenance Needed: <u>None required, sampling completed at this location</u>			

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>DM/BR/JB</u>	Date/Time: <u>12.12.2010 (2200)</u>		
Conductivity Meter Info. (Manuf., Model, Serial#, Cal. info.) <u>YSI 30 ENV #027 SN# 98D0994AB</u>			
Conductivity Testing (List individual sampler bottle, cond. reading $\mu\text{S}/\text{cm}$, included in comp sample Y/N):			
<u>1-100-Y</u>	<u>7-99-Y</u>	<u>13-67-Y</u>	<u>19-79-Y</u>
<u>2-189-Y</u>	<u>8-92-Y</u>	<u>14-70-Y</u>	<u>20-79-Y</u>
<u>3-100-Y</u>	<u>9-68-Y</u>	<u>15-68-Y</u>	<u>21-76-Y</u>
<u>4-96-Y</u>	<u>10-69-Y</u>	<u>16-66-Y</u>	<u>22-77-Y</u>
<u>5-99-Y</u>	<u>11-70-Y</u>	<u>17-79-Y</u>	<u>23-79-Y</u>
<u>6-90-Y</u>	<u>12-68-Y</u>	<u>18-79-Y</u>	<u>24-61-Y</u>
Brief Description of Compositing Scheme: (Include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Cond. value for Comp Smpl. = $100 \mu\text{S}/\text{cm}$, Comp Vol. = 8000 ml, analysis per FSP</u>			
Overall Composite Info. (include conductivity measurement, volume and requested analysis) <u>Used all btl's for comp sample.</u>			
Composite Sample ID & Time: <u>SW03-0010 (1304)</u>			
Field Blank Collected? (date/time)	<u>NO</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:

* Had issues w/ connecting to station via telemetry during STE after ~2100 on 12/11. Sampler had initiated/enabled and was well underway by mid-afternoon. Upon insp. post-storm the smplr had collected samples per program successfully - power cycled modem.



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

ver.111510

Station: 82.5	MH/CB#: CBS-6	Loc. Descrip. RMTS Area	Page: 1 of 2
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pages per station

Section 1. Station Reset and Inspection			
Personnel: DM/BR		Weather: Partly Sunny, 40's, lite breeze	
Arrival Date/Time: 12-10-10 (1255)			
Carry-over maintenance to do prior to set-up:			done?
Sampler Battery Voltage		Changed? (Y) N	New voltage 12.77
Modem Battery Voltage	12.85	Changed? Y (N)	New voltage
Sample Tubing & Strainer OK?	Yes	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	+1 min
Trans. Cable OK?	OK	Internal Sampler Tubing OK?	Yes
Trans. Desiccant OK (Yes/No)	Yes	Tubing Replaced? (Yes/No)	No
Telem. Box Desiccant OK (Yes/No)	Changed 3 bags	Normal Smlr Program or Dup. ?	Normal
Modem Status	Good	Bottles Loaded ?	Yes
Notes (including channel condition): Raw Gauge check: level = good throat = clear		Lid Status?	OFF
		Backflushed with DI?	Yes ~ 1 gal
		Suction line & quick connect attached?	Yes
		Smlr Status (on/off) / last screen..	See below

Section 2. Storm Setup and Inspection			
Personnel: DM/BR		Weather: Same as above	
Arrival Date/Time: See above			
Sampler Battery Voltage		Changed? (Y) N	New voltage 12.77
Modem Battery Voltage	12.85	Changed? Y (N)	New voltage
Sample Tubing & Strainer OK?	Yes	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	+1 min
Transducer Cable OK?	Yes	Aliquot Vol. Cal'ed (Y/N & vol.)	
Multi-meter Cable OK	Yes	Program Reviewed (Yes/No), Dup ?	Yes, normal
Recorded Level (FT)	0.148	Lids off bottles?	Yes
Measured Level (FT)	0.06	Diagnostics/Distributor arm check?	Yes
Offset Diff (FT)	0.088	Backflush with DI?	Yes
Level Adjusted ?	Yes	Storm Reset (1, enter) Completed	Yes
Cond. Sonde Type (YSI6820 or INW-CT2X)		Last screen...	Prgm Disabled 14:51 Fri 12-10-10.
Cond. Sonde Cal. Info. : Recorded Val. = 5906 Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val = (13:30) Time			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) Storm enable = R 0.03"/hr, Cond = 2K us/cm Level = 0.15'			

Section 3. Grab Sample Collection			
Personnel: Jonnston / Beckwith		Weather: Cloudy NO Rain	
Arrival Date/Time: 12/12/2010 1445			
On Composite... (Bottle #/ Aliq #)	Prgm Completed	Composite Begin Time (date / time)	12-11-10 (1307)
Grab Parameters Collected	TPH, FC		
Grab Sample ID	SW03-0004	Conductivity Reading (what meter?)	YSI 289 us
Grab Date/Time	1407 12/12/10	Grab MS/MSD Collected ?	Temp 13.0°C
Grab Dup ID	SW03-005 1407	Equipment running correctly?	Yes
Grab Dup Date/Time	1414 pup 1414	Sampler Battery Voltage (Changed?):	Mid-12's
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: OK			
Storm Controller notified (Y or N/A)? NA		Ice OK?	NA
Notes: standing water, small flow 14:14 Bottle 21 after 1 pulses Two bottles for TPH 10' ft down to water			

82.5
126.45
10.7°C
Migis 096.5 surface 78.5 510.6°C
Program 23 done
sample TPH sample & dup



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Page: 2 of 2Station: 82.5 continued from previous page

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel:	<u>DM/BR</u>	Weather:	<u>Overcast 40°s</u>	Arrival Date/Time:	<u>12-12-10 (1925)</u>
Sampler Battery Voltage	<u>---</u>	Changed?	<u>Y N</u>	Pulled	New voltage <u>---</u>
Telemetry Battery Voltage	<u>Mid-12.5</u>	Changed?	<u>Y (N)</u>		New voltage <u>---</u>
Additional Grabs (IDs, date/time)	<u>NA</u>				
Additional Dup Grab (IDs, date/time)	<u>NA</u>				
Composite Begin Time (date/time)	<u>12-11-10 (1301)</u>	Sampler Report Downloaded?	<u>Yes</u>		
Last Aliquot Taken (date/time, bott #, aliq #)	<u>12-12-10 (1251) BTL 24 4/4</u>				
Total Composite Sample Volume Collected	<u>24- 1L wedge bottles</u>				
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>None</u>				
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK</u>					
Storm Controller notified (Y or N/A)?:	<u>NA</u>	Which parameter?:	<u>NA</u>		
Notes: <u>BTLs equally filled, w/ no overfilling noted</u>					
Maintenance Needed: <u>None Required</u>					

Section 5. Compositing Scheme and QC Sampling

Personnel:	<u>DM/BR/JB</u>	Date/Time:	<u>12-12-10 (#2120)</u>
Conductivity Meter Info. (Manuf., Model, Serial#, Cal.info.)			
<u>YSI 30 Env#027 SN#98D0994AB</u>			
Conductivity Testing (List individual sampler bottle, cond. reading $\mu\text{S}/\text{cm}$, included in comp sample Y/N):			
<u>1-89-Y</u>	<u>7-49-Y</u>	<u>13-71-Y</u>	<u>19-69-Y</u>
<u>2-100-Y</u>	<u>8-49-Y</u>	<u>14-70-Y</u>	<u>20-65-Y</u>
<u>3-97-Y</u>	<u>9-72-Y</u>	<u>15-69-Y</u>	<u>21-66-Y</u>
<u>4-50-Y</u>	<u>10-68-Y</u>	<u>16-72-Y</u>	<u>22-69-Y</u>
<u>5-41-Y</u>	<u>11-67-Y</u>	<u>17-69-Y</u>	<u>23-69-Y</u>
<u>6-41-Y</u>	<u>12-69-Y</u>	<u>18-70-Y</u>	<u>24-70-Y</u>
Brief Description of Compositing Scheme: (Include what bottles, based on bench-top screening above, where used for the overall composite sample)			
<u>Used all 24 btl's for comp. sample</u>			
Overall Composite Info. (Include conductivity measurement, volume and requested analysis)			
<u>Overall comp vol. = 8040 ml, Cond. = 79.4 $\mu\text{S}/\text{cm}$, analysis per FSP</u>			
Composite Sample ID & Time: <u>SW03-0009 (1251)</u>			
Field Blank Collected? (date/time)	<u>NO</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

ver.111510

Station: <u>096</u>	MH/CB#: <u>MH 3878</u>	Loc. Descrip: <u>SE Build 457</u>	Page: <u>1</u> of <u>2</u>
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pages per station

Section 1. Station Reset and Inspection			
Personnel: <u>DM / BR</u>		Weather: <u>Overcast-to pty sunny, 40's</u> Arrival Date/Time: <u>12-10-10 1205</u>	
Carry-over maintenance to do prior to set-up: <u>batt. from Batt. Shop for smplr</u>		done? <u>Y</u>	
Sampler Battery Voltage	<u>12.88</u>	Changed? <u>Y</u> <u>(N)</u>	New voltage <u>---</u>
Modem Battery Voltage	<u>13.80</u>	Changed? <u>Y</u> <u>(N)</u>	New voltage <u>---</u>
Sample Tubing & Strainer OK?	<u>Y</u>	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	<u>+1 min</u> <u>✓</u>
Trands. Cable OK?	<u>Yes</u>	Internal Sampler Tubing OK?	<u>OK</u>
Trands. Desiccant OK (Yes/No)	<u>Yes</u>	Tubing Replaced? (Yes/No)	<u>NO</u>
Telem. Box Desiccant OK (Yes/No)	<u>Yes</u>	Normal Smplr Program or Dup.?	<u>Normal</u>
Modem Status	<u>Operational - good</u>	Bottles Loaded?	<u>Yes</u>
Notes (including channel condition): <u>* Will utilize Cond. Repeatable Disable</u> <u>Rain gauge ck: level/good, throat=clear</u>		Lid Status?	<u>OFF</u>
		Backflushed with DI?	<u>Yes ~1 gal</u>
		Suction line & quick connect attached?	<u>Yes</u>
		Smplr Status (on/off) / last screen..	<u>See below</u>

Section 2. Storm Setup and Inspection			
Personnel: <u>DM / BR</u>		Weather: <u>Same as above</u> Arrival Date/Time: <u>Same as above</u>	
Sampler Battery Voltage	<u>---</u>	Changed? <u>Y</u> <u>N</u>	New voltage <u>12.88</u>
Modem Battery Voltage	<u>---</u>	Changed? <u>Y</u> <u>N</u>	New voltage <u>13.80</u>
Sample Tubing & Strainer OK?	<u>OK</u>	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	<u>+1 min</u>
Transducer Cable OK?	<u>Yes</u>	Aliquot Vol. Cal.'ed (Y/N & vol.)	<u>240 ml - good</u>
Multi-meter Cable OK	<u>NA</u>	Program Reviewed (Yes/No), Dup?	<u>Yes - normal</u>
Recorded Level (FT)	<u>6.029</u>	Lids off bottles?	<u>Yes</u>
Measured Level (FT)	<u>6.03</u>	Diagnostics/Distributor arm check?	<u>Yes</u>
Offset Diff (FT)	<u>0.001</u>	Backflush with DI?	<u>Yes ~1 gal.</u>
Level Adjusted?	<u>NO</u>	Storm Reset (1, enter) Completed	<u>Yes</u>
Cond. Sonde Type (YSI6820 or INW-CT2X)	<u>CT2X</u>	Last screen... <u>Prog Disabled 12:39 Fri 12-10...</u>	
Cond. Sonde Cal. Info.: Recorded Val. = <u>45397</u> Meas. Val. = <u>---</u> Diff. = <u>---</u> (>10% adj. offset); Offset = <u>---</u> New Rec Val = <u>Time = 1238</u>			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) <u>No cond cal. performed</u> <u>enable cond's = R=0.03"/hr / Cond 2,000 µS/cm / Lvl = 0.2' / * Repeatable cond.</u>			

Section 3. Grab Sample Collection			
Personnel: <u>Johnston / Beckwith</u>		Weather: <u>cloudy no Rain</u> Arrival Date/Time: <u>12/12/20 1440</u>	
On Composite... (Bottle #/ Aliq #)	<u>BTL 21 3/4</u>	Composite Begin Time (date / time)	<u>12-11-10 (1402)</u>
Grab Parameters Collected	<u>TPH, EC</u>		
Grab Sample ID	<u>SW03-002</u>	Conductivity Reading (what meter?)	<u>YSI 289 µS</u>
Grab Date/Time	<u>12/12/10 1450</u>	Grab MS/MSD Collected?	<u>Temp 13.0°C</u>
Grab Dup ID	<u>NA</u>	Equipment running correctly?	<u>Yes</u>
Grab Dup Date/Time	<u>NA</u>	Sampler Battery Voltage (Changed?):	<u>mid-12's</u>
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: <u>OK</u>			
Storm Controller notified (Y or N/A)?:	<u>NA</u>	Ice OK?	<u>NA</u>
Notes: <u>See notes on 08215</u> <u>Two bottles TPH</u>			

Station: 096 continued from previous page

 Page: 2 of 2
Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM/BR</u>	Weather: <u>Overcast, 40°s</u>	Arrival Date/Time: <u>12-12-10 (1935)</u>
Sampler Battery Voltage	<u>---</u>	Changed? Y <u>N</u> <u>Pulled</u> New voltage <u>---</u>
Telemetry Battery Voltage	<u>mid-12's</u>	Changed? Y <u>(N)</u> New voltage <u>---</u>
Additional Grabs (IDs, date/time)	<u>NA</u>	
Additional Dup Grab (IDs, date/time)	<u>NA</u>	
Composite Begin Time (date/time)	<u>12-11-10 (1402)</u>	Sampler Report Downloaded? <u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>12-12-10 BTL 21 3/4 (1209)</u>	
Total Composite Sample Volume Collected	<u>21 1-L wedge bottles ①</u>	
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>None - all btls equally filled, w/ no overfilling noted</u>	
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK</u>		
Storm Controller notified (Y or N/A)? <u>NA</u>	Which parameter?: <u>NA</u>	
Notes: ① <u>Primed w/ cond. repeatable enable, worked great. After aliq. #3 BTL 21 the cond. increased to >2000 uS/cm and no other samples were collected.</u>		
Maintenance Needed: <u>Typical resets (1 more storm event needed at this location)</u>		

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>DM/BR/JB</u>	Date/Time: <u>12-12-2010</u>
Conductivity Meter Info. (Manuf., Model, Serial#, Cal. info.) <u>YSI 30 ENV#027 SN# 98D0994AB</u>	
Conductivity Testing (List individual sampler bottle, cond. reading $\mu\text{S/cm}$, included in comp sample Y/N):	
<u>1-99-Y</u>	<u>7-71-Y</u>
<u>2-386-Y</u>	<u>8-79-Y</u>
<u>3-90-Y</u>	<u>9-95-Y</u>
<u>4-182-Y</u>	<u>10-100-Y</u>
<u>5-146-Y</u>	<u>11-40-Y</u>
<u>6-41-Y</u>	<u>12-74-Y</u>
<u>13-41-Y</u>	<u>14-70-Y</u>
<u>15-24-Y</u>	<u>16-21-Y</u>
<u>17-98-Y</u>	<u>18-100-Y</u>
<u>19-28-Y</u>	<u>20-28-Y</u>
<u>21-30-Y</u>	<u>22-NA not collected</u>
	<u>23-NA</u>
	<u>24-NA</u>
Brief Description of Compositing Scheme: (Include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>* Smplr collected storm water via repeatable enable conductivity setting</u> <u>- used all 21 btls for comp sample (BTLs 22-24 not used) collected</u>	
Overall Composite Info. (include conductivity measurement, volume and requested analysis) <u>Cond total comp. = 80 $\mu\text{S/cm}$, Vol. = 5000, analysis per FSP</u>	
Composite Sample ID & Time: <u>SW03-0008 (1209)</u>	
Field Blank Collected? (date/time)	<u>No</u>
Blank ID:	<u>NA</u>
Duplicate comp sample? Yes/No	<u>No</u>
Duplicate sample ID	<u>NA</u>

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

ver.111510

Station: PSNS 126	MH/CB#: 5110	Loc. Descrip. Build 460 - SW corner	Page: 1 of 2
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pages per station

Section 1. Station Reset and Inspection			
Personnel: DM, BR		Weather: Overcast, 40's, lite breeze	
Arrival Date/Time: 12-10-10 (1000)			
Carry-over maintenance to do prior to set-up: place re-charged smplr batt.		done? Y	
Sampler Battery Voltage	12.95	Changed? (Y) N	New voltage 12.95
Modem Battery Voltage	12.16	Changed? Y (N)	New voltage 12.16
Sample Tubing & Strainer OK?	Yes	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	OK, adj +1 min
Trands. Cable OK?	Yes	Internal Sampler Tubing OK?	OK
Trands. Desiccant OK (Yes/No)	Yes	Tubing Replaced? (Yes/No)	No
Telem. Box Desiccant OK (Yes/No)	Yes	Normal Smplr Program or Dup. ?	Dup 120-ml aliq
Modem Status	Operational	Bottles Loaded ?	Yes
Notes (including channel condition):		Lid Status?	off (12-10-10)
Modem info. 206-455-0366		Backflushed with DI?	Yes ~1 gal DI
Rain gauge: Level = Good Throat = clear		Suction line & quick connect attached?	Yes
		Smplr Status (on/off) / last screen..	See below

Section 2. Storm Setup and Inspection			
Personnel: DM/BR		Weather: Same as above	
Arrival Date/Time: Same as above			
Sampler Battery Voltage		Changed? Y N	New voltage 12.95
Modem Battery Voltage		Changed? Y N	New voltage 12.16
Sample Tubing & Strainer OK?	Good	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	Yes
Transducer Cable OK?	Yes	Aliquot Vol. Cal.'ed (Y/N & vol.)	Yes @ 120 ml
Multi-meter Cable OK	NA	Program Reviewed (Yes/No), Dup ?	DUP
Recorded Level (FT)	2.300 2.37	Lids off bottles?	Yes
Measured Level (FT)	2.32	Diagnostics/Distributor arm check?	Yes
Offset Diff (FT)	0.05	Backflush with DI?	Yes
Level Adjusted ? (-0.08)	Y (+0.05) on	Storm Reset (1, enter) Completed	Yes
Cond. Sonde Type (YSI6820 or INW-CT2X)	CT2X	Last screen...	Prgrm Disabled 11:41 Fri 12/10
Cond. Sonde Cal. Info. : Recorded Val. = Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val =			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) No cond. cal., enable cond.s: R=0.03"/hr L=0.2', C=2,000 us/cm			

Section 3. Grab Sample Collection			
Personnel: Johnston Beckwith		Weather: clear, hot rain	
Arrival Date/Time: 12/12/10 1431			
On Composite... (Bottle #/ Aliq #)	Prgrm Completed	Composite Begin Time (date / time)	12-11-10 (1301)
Grab Parameters Collected	TPH, FC	Temp	10.6 C
Grab Sample ID	SW03-001	Conductivity Reading (what meter?)	188 540 uS
Grab Date/Time	12/12/10 1435	Grab MS/MSD Collected ?	NA
Grab Dup ID	SW03-DM NA	Equipment running correctly?	Y
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	Mid-12's
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: OK			
Storm Controller notified (Y or N/A)?:	NA	Ice OK?	OK
Notes: Temp. (YSI reading) = 10.6C "Program Complete" 2 bottles for TPH			

Station: 126 continued from previous page

 Page: 2 of 2
Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM/BR</u>	Weather: <u>Overcast, 40°s</u>	Arrival Date/Time: <u>12-12-10 (1945)</u>
Sampler Battery Voltage	<u>—</u>	Changed? Y N <u>Pulled</u>
Telemetry Battery Voltage	<u>Mid-12's</u>	Changed? Y (N)
Additional Grabs (IDs, date/time)	<u>NA</u>	
Additional Dup Grab (IDs, date/time)	<u>NA</u>	
Composite Begin Time (date/time)	<u>12-11-10 (1301)</u>	Sampler Report Downloaded? <u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>12-12-10 (1245) BTL's 23+24 4/4 ①</u>	
Total Composite Sample Volume Collected	<u>2.4 1-L wedge bottles</u>	
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>None, ① Dup sample collected</u>	
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK</u>		
Storm Controller notified (Y or N/A)? <u>NA</u>	Which parameter?: <u>NA</u>	
Notes: <u>All btl's equally filled, no over-filling noted</u>		
Maintenance Needed: <u>None Required - Sampling at this location completed</u>		

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>DM/BR/JB</u>	Date/Time: <u>12-12-10 (2015)</u>
Conductivity Meter Info. (Manuf., Model, Serial#, Cal.info.) <u>YSI 30 ENV# 027 SN# 98D0994AB</u>	
Conductivity Testing (List individual sampler bottle, cond. reading μ S/cm, included in comp sample Y/N):	
1 - 324 - Y	8 - 128 - Y
3 8 Dup - 71 - Y	14 Dup - 77 - Y
5 3 - 121 - Y	20 Dup - 22 - Y
7 8 Dup - 60 - Y	15 - 40 - Y
2 5 - 322 - Y	21 - 19 - Y
4 8 Dup - 69 - Y	22 Dup - 19 Y
	10 Dup - 27 - Y
	16 Dup - 79 - Y
	23 - 149 - Y
	11 - 77 - Y
	17 - 29 - Y
	18 Dup - 28 - Y
	24 Dup - 169 - Y
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Used all btl's for simple + dup sample</u>	
Overall Composite Info. (include conductivity measurement, volume and requested analysis) <u>Normal Sample = 289 μS/cm</u> <u>Dup Sample = 72 μS/cm</u> <u>both vol.s = 9500 - 9900 mls, analysis per FSP</u>	
Composite Sample ID & Time: <u>SW03-0006 (1245)</u>	
Field Blank Collected? (date/time)	<u>NO</u>
Blank ID:	<u>NA</u>
Duplicate comp sample? Yes/No	<u>Yes</u>
Duplicate sample ID	<u>SW03-0007 (1245)</u>

NOTES:

STE#3

PSNS NDDSW Monitoring Project

12/10/2010

Main Tasks: Station re-sets (post STE#2), routine maint.
and troubleshooting all in preparation for STE#3

Ferry: over = 0735
back

Who: Dave M & Bryan R.

Weather: Overcast, hi-mid 40's, winds lite, end of 3-day precip
cycle (surfaces still wet w/ standing water in places), forecasted to
be "dry" for next ~36 hrs - v. large/wet system approaching

- ✓ Head over to battery shop and pick up 4 sampler batteries
- ✓ Need to prgm a "dup" set-up @ 126
- ✓ Check modem ESN#s - all checked out per Verizon listed info.
- ✓ Clean rain gauges, re-level as necessary
- ✓ Place clean wedge btls into simplr bases
- ✓ Org. items in store room
- ✓ Re-set all four CIA stations
 - all enable conds = Rain (0.03"/hr), Cond (2000 μ S/cm) and
Level (0.2') [except @ 82.5 = 0.15']
 - * @ 096 prgm'd a repeatable cond. enable
- Investigated the "GetReport" function at 82.5; was able to connect &
obtain sampler report via LN Terminal Emulator while connected
to D.L. via donggle pig-tail. Suspect TAI cable Interrogator is wired wrong.
Will try "pin-out" Interrogator to see where Tx/Rx/G wires correspond
to on donggle - then correlate these pins/wires to those currently used
at 82.5 & 096 - take appropriate action to fix comm. issue.

② STE #3, Storm Notes

- Downloaded WF info (~2000) 12.10.10
- Checked weather & stations ~ 2200, all is well
12.10.10
- Checked weather & stations ~ 1000 (12.11.10), all is well
- Around 1200, lowered "Level" enable conditions to an interim level because it's now raining (+0.03"/hr) in Bremerton - Don't want to miss heavy rain slug that may drastically lower cond. - while trying to delay the sample start as long as possible
- PSNS 126 Comp begin = 1303; other station followed
- Spoke w/ both Jill & Bob re: earlier start time & logistics for grab collection and Monday's comp. event.

- ~ (2030)

82.5	096	126	81.1
Smpl 30	* Repeatable Cond.	Smpl. 31	Can not connect
	Smpl. 20	lvl. = 0.26	
	lvl = 5.71	Cond. = 33.46	
	Cond = 49.46		

- 12/12/2010

- Attempted many times today to connect w/ 81.1, to no avail
• Modem likely needs to be power-cycled
- All other stations (126, 096, 82.5) operated just fine; 096 w/ cond repeat. enable & a dup prgm @ 126
- Bob & Bruce collected Grabs this afternoon b/w 1330/1500
- Heading into yrd. tonight at 1830 to conduct comping w/ Brian & Jill

SAMPLE CHAIN OF CUSTODY FORM

Date: _____ of _____
 Page: _____ of _____
 Project No.: N4523A10MP00034 Amend.1
 Project: PSNSNon-dry Dock SW 2010

Battelle

Marine Sciences Laboratory
 1529 West Sequim Bay Road
 Laboratory: Battelle MSL
 Attention: Jill Brandenberger
 Phone: (360) 681-4564

Sample Label	Station ID	Collection Date/Time	Matrix	Analyze parameters per QAP/FSP										No. containers	Sample Type (Grab vs. Comp)	Storm#	Notes
				Hardness	TOC	DOC	TSS	TME/DME	TPH	Turbidity							
SW03-001#1	PSNS126	12/12/10 1430	SW											2	grab	SW03	1 of 2
-001#2	PSNS126	1430	SW											2			2 of 2
-002#1	PSNS081.1	96 1450	SW											2			1 of 2 bottle mislabeled
-002#2	PSNS081.1	96 1450	SW											2			2 of 2 bottle mislabeled
-003#1	PSNS081.1	1540	SW											2			1 of 2
-003#2	PSNS081.1	1540	SW											2			2 of 2
-004#1	PSNS082.5	1607												2			1 of 2
-004#2	PSNS082.5	1607												2			2 of 2
-005#1	↓ DUP	1614	↓											2			1 of 2 field dup
-005#2	↓ DUP	164	↓											2			2 of 2 field dup
Relinquished by: <u>RK Johnston</u> <u>12/12/2010</u> <u>1730</u> Signature Date Time <u>RK Johnston</u> <u>USN SSCPAE</u> Printed Name Company				Received by: <u>Jm Brandenberger</u> <u>12/12/10</u> Signature <u>Jm Brandenberger</u> <u>1840</u> Printed Name										Total # of Containers: Shipment Method:			
Relinquished by: _____ Signature Date Time Printed Name Company				Received by: _____ Signature Printed Name										Sample Disposition: Distribution: 1) PNNL 2) CAS 3) TAI			

Date: 12-12-2010

Page: 1 of 1

Project No.: N4523A10MP00034 Amend.1

Project: PSNSNon-dry Dock SW 2010

Marine Sciences Laboratory
1529 West Sequim Bay Road

Laboratory: Battelle MSL

Attention: Jill Brandenberger

Phone: (360) 681-4564

[illegible]

Turbidity Worksheet

Project ID: SW01 Non Dry Dock Storm Water

Date: 12/12/2010

Instrument Used: Model 965 IR Nephelometer

Sample ID	Turbidity (NTU)	% Recovery or RPD
0 NTU	00.0	
40 NTU	40.7	
PSNS096	14.6	
PSNS081.1	22.0	
PSNS126	3.12	
PSNS126DUP	3.70	
PSNS082.5 R1	13.1	
PSNS082.5 R2	13.6	#DIV/0!
40 NTU	40.4	

Stormwater Outfall Total Discharge Volume Estimation Equations

PSNS Drainage Basin	Total Basin Area (ft ²)	Type of Surface	Percentage of Drainage Basin Surface Type	Area of Basin Surface Type (ft ²)	¹ Runoff Coefficient Range	Area of Basin Surface Type with Maximum Coefficient Value Applied (ft ²)	² Total Discharge Volume (ft ³)
126	662,986	Impervious	98.55	653,373	0.6 – 0.9	588,036	R(591,881)
		Pervious	1.45	9,613	0.2 – 0.4	3,845	
096	717,872	Impervious	97	696,336	0.6 – 0.9	626,702	R(635,317)
		Pervious	3	21,536	0.2 – 0.4	8,615	
082.5	87,120	Impervious	100	87120	0.7 - 0.95	82,764	R(82,764)
081.1	965,294	Impervious	97	936,335	0.6 – 0.9	842703	R(849,074)
		Pervious	3	28,959	0.18 – 0.22	6,371	

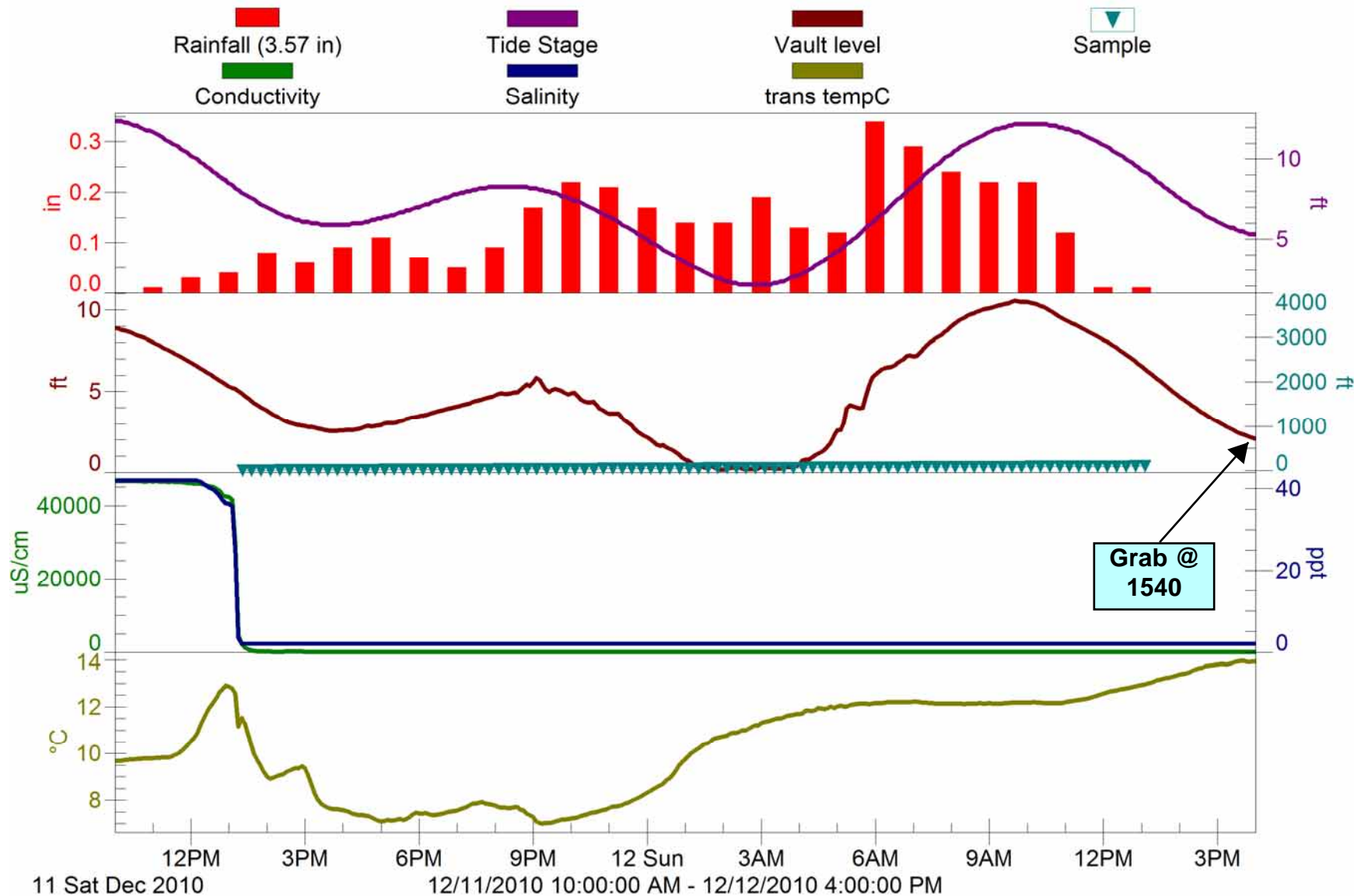
Calculation Worksheet:

STE#3 12/11/2010

STATION	Combined Drainage Area (FT ²)	ENTER: STE Rain Total (in)	STE Rain Total (FT)	STE Runoff Vol. (gal)	ENTER: Smpl Evnt Rain Total (in)	Sampl Evnt Rain Total (FT)	Sample Event Runoff Vol. (gal)
126	591,881	3.71	0.3092	1,368,859.24	3.62	0.3017	1,335,652.41
096	635,317	4.47	0.3725	1,770,306.58	4.29	0.3575	1,699,019.07
082.5	82,764	4.44	0.3700	229,073.54	4.33	0.3608	223,398.29
081.1	849,074	3.57	0.2975	1,889,575.47	3.45	0.2875	1,826,060.33

PSNS081.1

STE#3 12-11-2010



PSNS082.5

STE#3 12-11-10

Rainfall (4.44 in)

Tide Stage (7.483 ft)

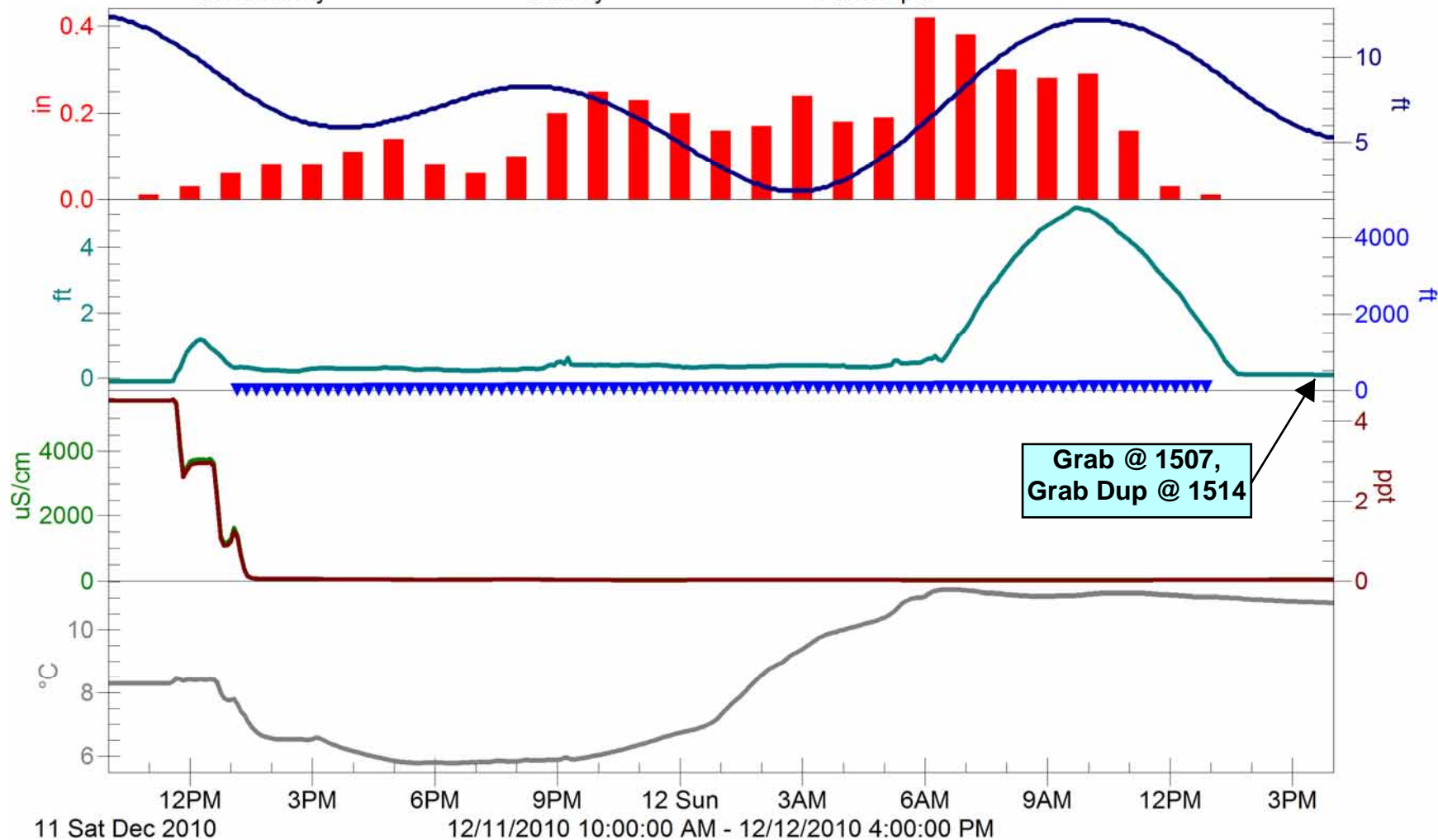
Vault level

Sample

Conductivity

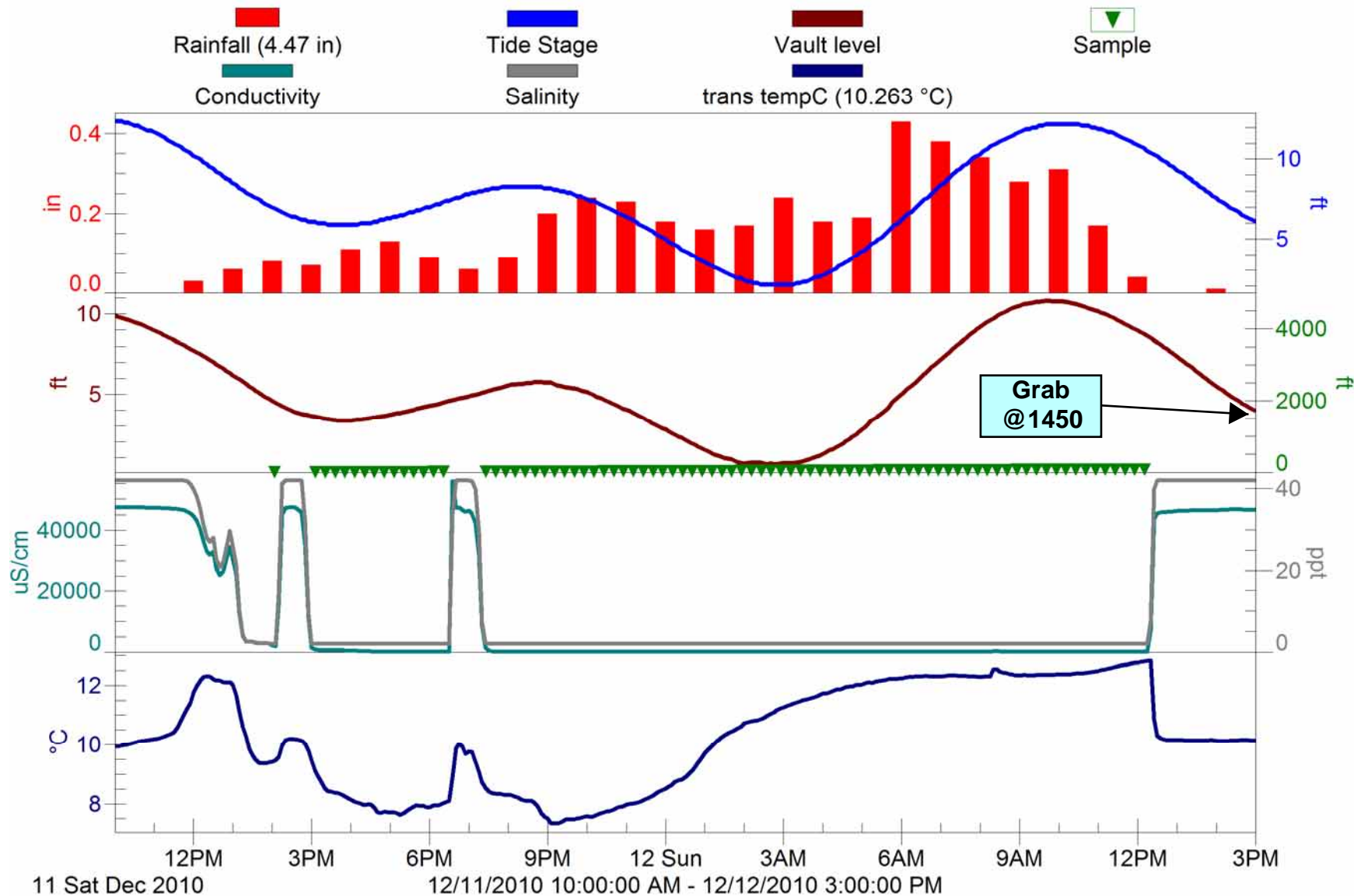
Salinity

YSI tempC



PSNS096

STE#3 12-11-10



PSNS126

STE#3 12-11-10

Rainfall (3.71 in)

Sample (49.500 ft)

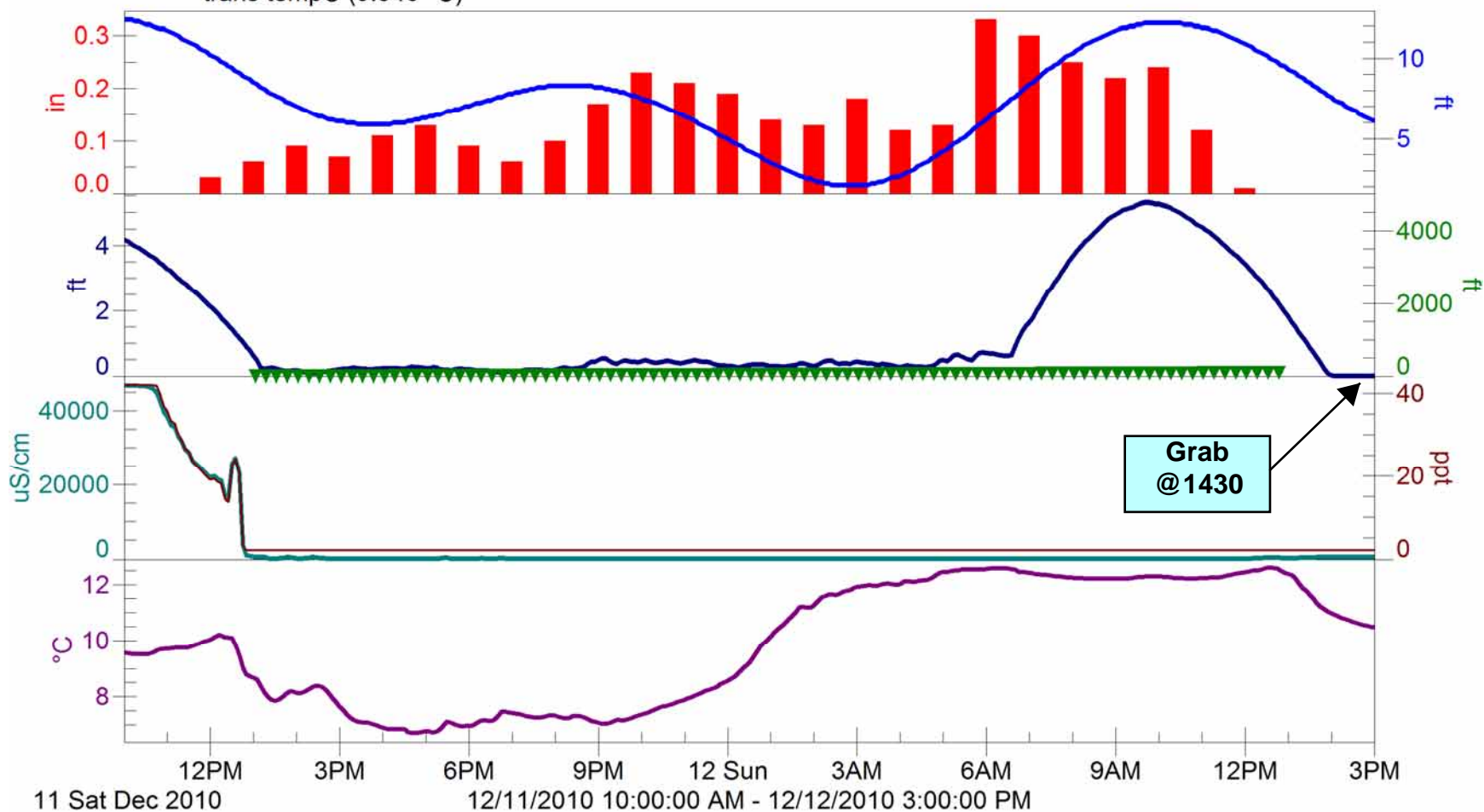
trans tempC (9.940 °C)

Tide Stage

Conductivity (3256.67 uS/cm)

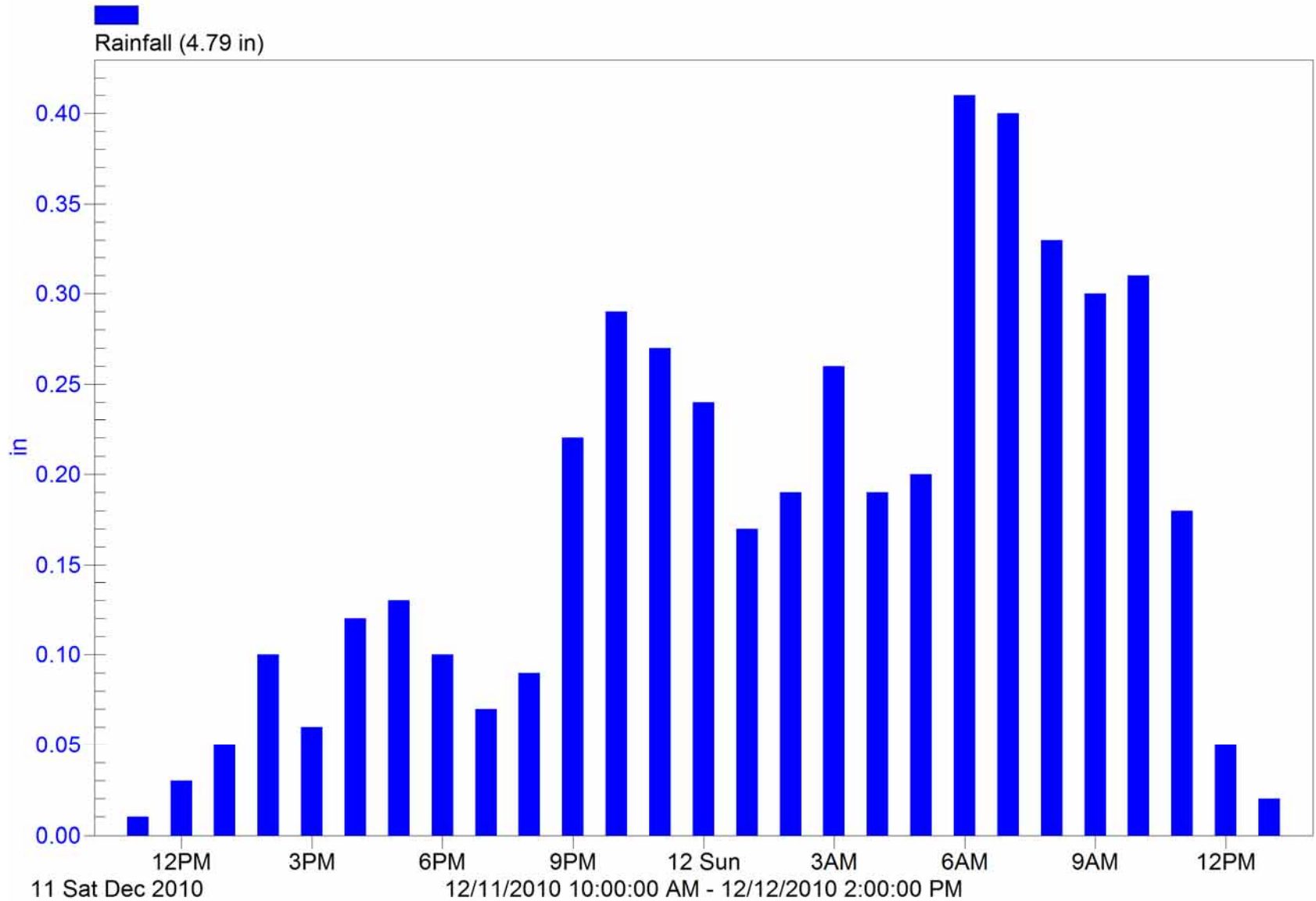
Vault level

Salinity (4.649 ppt)



PSNS B427 Rain

STE#3 12-11-10



STE#3 81.1 Smp1r Rpt.txt

SAMPLER ID# 3293179321 19:12 12-DEC-10

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS081-1 "

SITE DESCRIPTION:

"PSNS081-1 "

UNITS SELECTED:

LENGTH: ft

24, 1000 m1 BTLS
39 ft SUCTION LINE
17 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 m1 SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

STE#3 81.1 Smp1r Rpt.txt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 3293179321 19:13 12-DEC-10
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS081-1
PROGRAM: PSNS081-1
Program Started at 15:39 FR 10-DEC-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID

		15:39	PGM	DISABLED	
		SA 11-DEC-10	-----		
		13:20	PGM	ENABLED	
1,4	1	13:20	E		1241
2,4	1	13:34	F		1241
3,4	1	13:49	F		1250
4,4	1	14:04	F		1256
1,4	2	14:19	F		1263
2,4	2	14:34	F		1278
3,4	2	14:49	F		1280

STE#3 81.1 Smp1r Rpt.txt

4,4	2	15:04	F	1279
1,4	3	15:19	F	1287
2,4	3	15:34	F	1284
3,4	3	15:49	F	1292
4,4	3	16:04	F	1280
1,4	4	16:19	F	1286
2,4	4	16:34	F	1285
3,4	4	16:49	F	1279
4,4	4	17:04	F	1280
1,4	5	17:19	F	1277
2,4	5	17:34	F	1272
3,4	5	17:49	F	1268
4,4	5	18:04	F	1269
1,4	6	18:19	F	1272
2,4	6	18:34	F	1265
3,4	6	18:49	F	1267
4,4	6	19:04	F	1257
1,4	7	19:19	F	1253
2,4	7	19:34	F	1256
3,4	7	19:49	F	1252
4,4	7	20:04	F	1247
1,4	8	20:19	F	1244
2,4	8	20:34	F	1247
3,4	8	20:49	F	1237
4,4	8	21:04	F	1229
1,4	9	21:19	F	1244
2,4	9	21:34	F	1238
3,4	9	21:49	F	1249
4,4	9	22:04	F	1253
1,4	10	22:19	F	1260
2,4	10	22:34	F	1257
3,4	10	22:49	F	1271
4,4	10	23:04	F	1280
1,4	11	23:19	F	1283
2,4	11	23:34	F	1292
3,4	11	23:49	F	1298
-----SU 12-DEC-10-----				
4,4	11	00:04	F	1313
1,4	12	00:19	F	1320
2,4	12	00:34	F	1334
3,4	12	00:49	F	1373
4,4	12	01:04	F	1361
1,4	13	01:19	F	1352
2,4	13	01:34	F	1358
3,4	13	01:49	F	1365
4,4	13	02:04	F	1365
1,4	14	02:19	F	1364
2,4	14	02:34	F	1358
3,4	14	02:49	F	1357
4,4	14	03:04	F	1359
1,4	15	03:19	F	1359
2,4	15	03:34	F	1362
3,4	15	03:49	F	1359
4,4	15	04:04	F	1351
1,4	16	04:19	F	1340
2,4	16	04:34	F	1330
3,4	16	04:49	F	1315
4,4	16	05:04	F	1307
1,4	17	05:19	F	1273
2,4	17	05:34	F	1279
3,4	17	05:49	F	1243
4,4	17	06:04	F	1229
1,4	18	06:19	F	1232

				STE#3 81.1 Smp1r Rpt.txt
2,4	18	06:34	F	1217
3,4	18	06:49	F	1212
4,4	18	07:04	F	1215
1,4	19	07:19	F	1200
2,4	19	07:34	F	1197
3,4	19	07:49	F	1189
4,4	19	08:04	F	1183
1,4	20	08:19	F	1182
2,4	20	08:34	F	1176
3,4	20	08:49	F	1172
4,4	20	09:04	F	1172
1,4	21	09:19	F	1164
2,4	21	09:34	F	1165
3,4	21	09:49	F	1164
4,4	21	10:04	F	1170
1,4	22	10:19	F	1165
2,4	22	10:34	F	1169
3,4	22	10:49	F	1178
4,4	22	11:04	F	1182
1,4	23	11:19	F	1190
2,4	23	11:34	F	1194
3,4	23	11:49	F	1190
4,4	23	12:04	F	1201
1,4	24	12:19	F	1203
2,4	24	12:34	F	1212
3,4	24	12:49	F	1218
4,4	24	13:04	F	1226
		13:05	PGM DONE	12-DEC

SOURCE E ==> ENABLE
SOURCE F ==> FLOW

STE#3 82.5 Smp1r Rpt.txt

SAMPLER ID# 2483481595 19:22 12-DEC-10
Hardware: B2 Software: 3.21
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"PSNS082-5 "
SITE DESCRIPTION:
"PSNS082-5 "

UNITS SELECTED:
LENGTH: ft

24, 1000 m1 BTLS
13 ft SUCTION LINE
AUTO SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 m1 SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

STE#3 82.5 Smp1r Rpt.txt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 2483481595 19:22 12-DEC-10
Hardware: B2 Software: 3.21
***** SAMPLING RESULTS *****
SITE: PSNS082-5
PROGRAM: PSNS082-5
Program Started at 14:50 FR 10-DEC-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID

		14:50	PGM	DISABLED	
		SA 11-DEC-10			
		13:07	PGM	ENABLED	
1,4	1	13:07	E		378
2,4	1	13:21	F		376
3,4	1	13:36	F		380
4,4	1	13:51	F		383
1,4	2	14:06	F		382
2,4	2	14:21	F		382
3,4	2	14:36	F		383

STE#3 82.5 Smp1r Rpt.txt

4,4	2	14:51	F	384
1,4	3	15:06	F	381
2,4	3	15:21	F	384
3,4	3	15:36	F	380
4,4	3	15:51	F	384
1,4	4	16:06	F	381
2,4	4	16:21	F	384
3,4	4	16:36	F	381
4,4	4	16:51	F	382
1,4	5	17:06	F	382
2,4	5	17:21	F	382
3,4	5	17:36	F	384
4,4	5	17:51	F	381
1,4	6	18:06	F	382
2,4	6	18:21	F	383
3,4	6	18:36	F	382
4,4	6	18:51	F	382
1,4	7	19:06	F	383
2,4	7	19:21	F	382
3,4	7	19:36	F	383
4,4	7	19:51	F	382
1,4	8	20:06	F	377
2,4	8	20:21	F	382
3,4	8	20:36	F	384
4,4	8	20:51	F	381
1,4	9	21:06	F	382
2,4	9	21:21	F	384
3,4	9	21:36	F	381
4,4	9	21:51	F	383
1,4	10	22:06	F	382
2,4	10	22:21	F	382
3,4	10	22:36	F	382
4,4	10	22:51	F	382
1,4	11	23:06	F	382
2,4	11	23:21	F	382
3,4	11	23:36	F	382
4,4	11	23:51	F	382
-----SU 12-DEC-10-----				
1,4	12	00:06	F	382
2,4	12	00:21	F	383
3,4	12	00:36	F	384
4,4	12	00:51	F	380
1,4	13	01:06	F	382
2,4	13	01:21	F	384
3,4	13	01:36	F	381
4,4	13	01:51	F	384
1,4	14	02:06	F	380
2,4	14	02:21	F	384
3,4	14	02:36	F	380
4,4	14	02:51	F	382
1,4	15	03:06	F	384
2,4	15	03:21	F	380
3,4	15	03:36	F	385
4,4	15	03:51	F	383
1,4	16	04:06	F	384
2,4	16	04:21	F	381
3,4	16	04:36	F	384
4,4	16	04:51	F	380
1,4	17	05:06	F	382
2,4	17	05:21	F	384
3,4	17	05:36	F	381
4,4	17	05:51	F	384
1,4	18	06:06	F	380

				STE#3 82.5 Smp1r Rpt.txt
2,4	18	06:21	F	383
3,4	18	06:36	F	382
4,4	18	06:51	F	379
1,4	19	07:06	F	378
2,4	19	07:21	F	374
3,4	19	07:36	F	374
4,4	19	07:51	F	374
1,4	20	08:06	F	370
2,4	20	08:21	F	371
3,4	20	08:36	F	368
4,4	20	08:51	F	365
1,4	21	09:06	F	368
2,4	21	09:21	F	363
3,4	21	09:36	F	362
4,4	21	09:51	F	363
1,4	22	10:06	F	363
2,4	22	10:21	F	368
3,4	22	10:36	F	364
4,4	22	10:51	F	368
1,4	23	11:06	F	368
2,4	23	11:21	F	370
3,4	23	11:36	F	374
4,4	23	11:51	F	369
1,4	24	12:06	F	374
2,4	24	12:21	F	376
3,4	24	12:36	F	380
4,4	24	12:51	F	382
		12:51	PGM DONE	12-DEC

SOURCE E ==> ENABLE
SOURCE F ==> FLOW

SAMPLER ID# 2483481595 19:23 12-DEC-10
Hardware: B2 Software: 3.21
MODULE: NONE
Hardware: Software: 0.00
***** COMBINED RESULTS *****
SITE: PSNS082-5
PROGRAM: PSNS082-5
Program Started at 14:50 FR 10-DEC-10
Nominal Sample Volume = 240 ml

MODULE: NONE

SAMPLER ID# 2483481595 19:23 12-DEC-10
Hardware: B2 Software: 3.21
***** COMBINED RESULTS *****
SITE: PSNS082-5
PROGRAM: PSNS082-5
Program Started at 14:50 FR 10-DEC-10
Nominal Sample Volume = 240 ml
FR-TEMP
SAMPLE BOTTLE TIME C

NO FR-TEMPERATURE

STE#3 096 Smp1r Rpt.txt

SAMPLER ID# 3293179316 19:36 12-DEC-10

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS096"

SITE DESCRIPTION:

"PSNS096"

UNITS SELECTED:

LENGTH: ft

24, 1000 m^l BTLS
20 ft SUCTION LINE
17 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 m^l SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I/O1= NONE
I/O2= NONE
I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 3293179316 19:37 12-DEC-10
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS096
PROGRAM: PSNS096
Program Started at 12:39 FR 10-DEC-10
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID
-----	-----	-----	---	---	-----
		12:39	PGM	DISABLED	
		SA 11-DEC-10			
		14:02	PGM	ENABLED	
1,4	1	14:02	E		611
2,4	1	15:04	F		615
3,4	1	15:19	F		623
4,4	1	15:34	F		619
1,4	2	15:49	F		621
2,4	2	16:04	F		624
3,4	2	16:19	F		625

STE#3 096 Smp1r Rpt.txt

4,4	2	16:34	F	619
1,4	3	16:49	F	620
2,4	3	17:04	F	618
3,4	3	17:19	F	618
4,4	3	17:34	F	618
1,4	4	17:49	F	617
2,4	4	18:04	F	614
3,4	4	18:19	F	614
4,4	4	19:24	F	605
1,4	5	19:39	F	602
2,4	5	19:54	F	600
3,4	5	20:09	F	605
4,4	5	20:24	F	602
1,4	6	20:39	F	602
2,4	6	20:54	F	605
3,4	6	21:09	F	607
4,4	6	21:24	F	605
1,4	7	21:39	F	607
2,4	7	21:54	F	631
3,4	7	22:09	F	613
4,4	7	22:24	F	619
1,4	8	22:39	F	619
2,4	8	22:54	F	621
3,4	8	23:09	F	625
4,4	8	23:24	F	626
1,4	9	23:39	F	632
2,4	9	23:54	F	637
-----SU 12-DEC-10-----				
3,4	9	00:09	F	632
4,4	9	00:24	F	643
1,4	10	00:39	F	643
2,4	10	00:54	F	644
3,4	10	01:09	F	655
4,4	10	01:24	F	655
1,4	11	01:39	F	656
2,4	11	01:54	F	667
3,4	11	02:09	F	668
4,4	11	02:24	F	661
1,4	12	02:39	F	661
2,4	12	02:54	F	661
3,4	12	03:09	F	661
4,4	12	03:24	F	656
1,4	13	03:39	F	661
2,4	13	03:54	F	656
3,4	13	04:09	F	655
4,4	13	04:24	F	649
1,4	14	04:39	F	643
2,4	14	04:54	F	643
3,4	14	05:09	F	631
4,4	14	05:24	F	631
1,4	15	05:39	F	619
2,4	15	05:54	F	619
3,4	15	06:09	F	614
4,4	15	06:24	F	613
1,4	16	06:39	F	607
2,4	16	06:54	F	602
3,4	16	07:09	F	595
4,4	16	07:24	F	590
1,4	17	07:39	F	584
2,4	17	07:54	F	579
3,4	17	08:09	F	577
4,4	17	08:24	F	576
1,4	18	08:39	F	572

STE#3 096 Smp1r Rpt.txt

2,4	18	08:54	F	572
3,4	18	09:09	F	571
4,4	18	09:24	F	566
1,4	19	09:39	F	564
2,4	19	09:54	F	567
3,4	19	10:09	F	569
4,4	19	10:24	F	569
1,4	20	10:39	F	569
2,4	20	10:54	F	569
3,4	20	11:09	F	573
4,4	20	11:24	F	576
1,3	21	11:39	F	578
2,3	21	11:54	F	577
3,3	21	12:09	F	584
		19:32	MANUAL PAUSE	
		19:32	PGM STOPPED 12-DEC	

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW

STE#3 126DUP Smp1r Rpt.txt

SAMPLER ID# 2425481222 19:45 12-DEC-10

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS126DUP"

SITE DESCRIPTION:

"PSNS126DUP"

UNITS SELECTED:

LENGTH: ft

24, 1000 m1 BTLS
21 ft SUCTION LINE
13 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

SAMPLE AT START

DISTRIBUTION:

2 BOTTLES/SAMPLE

8 SAMPLES/BOTTLE

VOLUME:

120 m1 SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
 BTL FULL DETECT OFF
 TIMED BACKLIGHT

EVENT MARK SENT
 DURING PUMP CYCLE

PUMP COUNTS FOR
 EACH PURGE CYCLE:
 200 PRE-SAMPLE
 AUTO POST-SAMPLE

I/O1= NONE
 I/O2= NONE
 I/O3= NONE

0 ANALOG OUTPUTS

NO PERIODIC
 SERIAL OUTPUT

NO DIALOUT
 CONDITIONS SET

 SAMPLER ID# 2425481222 19:45 12-DEC-10
 Hardware: B2 Software: 3.26
 ***** SAMPLING RESULTS *****
 SITE: PSNS126DUP
 PROGRAM: PSNS126DUP
 Program Started at 11:40 FR 10-DEC-10
 Nominal Sample Volume = 120 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	COUNT TO LIQUID
-----	-----	-----	---	---	-----
		11:40	PGM	DISABLED	
		SA 11-DEC-10			
		13:01	PGM	ENABLED	
1,8	1-2	13:01	E		667
2,8	1-2	13:15	F		668
3,8	1-2	13:30	F		676
4,8	1-2	13:45	F		676
5,8	1-2	14:00	F		677
6,8	1-2	14:15	F		677
7,8	1-2	14:30	F		675

STE#3 126DUP Smp1r Rpt.txt

8,8	1-2	14:45	F	678
1,8	3-4	15:00	F	677
2,8	3-4	15:15	F	676
3,8	3-4	15:30	F	676
4,8	3-4	15:45	F	676
5,8	3-4	16:00	F	676
6,8	3-4	16:15	F	682
7,8	3-4	16:30	F	675
8,8	3-4	16:45	F	681
1,8	5-6	17:00	F	676
2,8	5-6	17:15	F	665
3,8	5-6	17:30	F	682
4,8	5-6	17:45	F	676
5,8	5-6	18:00	F	680
6,8	5-6	18:15	F	682
7,8	5-6	18:30	F	680
8,8	5-6	18:45	F	682
1,8	7-8	19:00	F	680
2,8	7-8	19:15	F	682
3,8	7-8	19:30	F	675
4,8	7-8	19:45	F	680
5,8	7-8	20:00	F	712
6,8	7-8	20:15	F	682
7,8	7-8	20:30	F	678
8,8	7-8	20:45	F	676
1,8	9-10	21:00	F	673
2,8	9-10	21:15	F	675
3,8	9-10	21:30	F	674
4,8	9-10	21:45	F	676
5,8	9-10	22:00	F	677
6,8	9-10	22:15	F	677
7,8	9-10	22:30	F	678
8,8	9-10	22:45	F	675
1,8	11-12	23:00	F	674
2,8	11-12	23:15	F	676
3,8	11-12	23:30	F	672
4,8	11-12	23:45	F	684
-----SU 12-DEC-10-----				
5,8	11-12	00:00	F	678
6,8	11-12	00:15	F	677
7,8	11-12	00:30	F	677
8,8	11-12	00:45	F	677
1,8	13-14	01:00	F	676
2,8	13-14	01:15	F	681
3,8	13-14	01:30	F	676
4,8	13-14	01:45	F	682
5,8	13-14	02:00	F	682
6,8	13-14	02:15	F	676
7,8	13-14	02:30	F	676
8,8	13-14	02:45	F	682
1,8	15-16	03:00	F	680
2,8	15-16	03:15	F	678
3,8	15-16	03:30	F	676
4,8	15-16	03:45	F	681
5,8	15-16	04:00	F	676
6,8	15-16	04:15	F	681
7,8	15-16	04:30	F	682
8,8	15-16	04:45	F	682
1,8	17-18	05:00	F	680
2,8	17-18	05:15	F	678
3,8	17-18	05:30	F	688
4,8	17-18	05:45	F	682
5,8	17-18	06:00	F	678

STE#3 126DUP Smp1r Rpt.txt

6,8	17-18	06:15	F	674
7,8	17-18	06:30	F	678
8,8	17-18	06:45	F	672
1,8	19-20	07:00	F	664
2,8	19-20	07:15	F	656
3,8	19-20	07:30	F	656
4,8	19-20	07:45	F	646
5,8	19-20	08:00	F	639
6,8	19-20	08:15	F	635
7,8	19-20	08:30	F	629
8,8	19-20	08:45	F	637
1,8	21-22	09:00	F	632
2,8	21-22	09:15	F	631
3,8	21-22	09:30	F	629
4,8	21-22	09:45	F	626
5,8	21-22	10:00	F	629
6,8	21-22	10:15	F	628
7,8	21-22	10:30	F	627
8,8	21-22	10:45	F	632
1,8	23-24	11:00	F	634
2,8	23-24	11:15	F	635
3,8	23-24	11:30	F	640
4,8	23-24	11:45	F	643
5,8	23-24	12:00	F	645
6,8	23-24	12:15	F	652
7,8	23-24	12:30	F	652
8,8	23-24	12:45	F	653
		12:46	PGM DONE	12-DEC

SOURCE E ==> ENABLE

SOURCE F ==> FLOW

National Weather Service National Headquarters

National Weather Service

Area Forecast Discussion

Issued by NWS Seattle/Tacoma, WA

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FXUS66 KSEW 111729
AFDSEW

AREA FORECAST DISCUSSION

NATIONAL WEATHER SERVICE SEATTLE WA
930 AM PST [SAT](#) DEC 11 2010

.SYNOPSIS...A BRIEF SPELL OF DRY WEATHER WILL END LATER TODAY...AS A STRONG WARM [FRONT](#) MOVES NORTH ACROSS THE AREA. THIS WILL BRING AN EPISODE OF VERY WET AND UNSEASONABLY WARM WEATHER TONIGHT THROUGH SUNDAY NIGHT...WITH SOME FLOODING [LIKELY](#). A COLD [FRONT](#) WILL MOVE THROUGH SUNDAY NIGHT. OCCASIONAL RAIN AND COOLER WEATHER WILL PREVAIL NEXT WEEK...WITH SNOW IN THE MOUNTAINS.

&&

.SHORT TERM...THE LEADING EDGE OF THE WARM FRONTAL PRECIPITATION IS BEGINNING TO MOVE INTO FAR SOUTHWEST WASHINGTON THIS MORNING. RAIN WILL CONTINUE TO SPREAD NORTH ACROSS THE AREA TODAY. ALL AREAS SHOULD BE RAINING BY EVENING. RAIN WILL BECOME HEAVY IN SOME OF THE SOUTHERN LOCATIONS THIS AFTERNOON.

SNOW LEVELS ARE STARTING OUT AROUND 2500-3000 FEET THIS MORNING. THESE WILL RISE SHARPLY TO 7000 OR 8000 FEET THIS AFTERNOON AND EVENING. LOW LEVEL CROSS-CASCADE PRESSURE GRADIENTS WILL BE EASTERLY UNTIL AROUND MIDNIGHT TONIGHT...KEEPING A WINTERY MIX IN THE PASSES. WITH HEFTY [QPF](#) AMOUNTS...THE PASSES COULD GET SEVERAL INCHES OF SNOW AND POSSIBLY SOME FREEZING RAIN BEFORE TURNING TO RAIN. A WINTER WEATHER ADISORY IS IN EFFECT FOR THIS.

THE BIG STORY OF COURSE IS THE HEAVY RAIN THAT WILL FALL TONIGHT WITH THE WARM [FRONT](#) AND SUNDAY AS A BAROCLINIC [JET](#) CONTINUES TO CONVEY SUB-TROPICAL [MOISTURE](#) INTO THE FORECAST AREA. RAIN WILL GRADUALLY DECREASE SUNDAY NIGHT AS THE COLD [FRONT](#) MOVES EASTWARD ACROSS WESTERN WASHINGTON...BRINGING AN END TO HYDROLOGICALLY SIGNIFICANT PRECIPITATION.

OVERALL THE MODELS HAVE BEEN CONSISTENT OVER THE LAST COUPLE DAYS WITH THE [GFS](#)...UW WRF-[GFS](#)...AND EUROPEAN MODEL SHOWING THE HEAVIEST RAIN SOMEWHAT FURTHER NORTH THAN THE [NAM](#) AND UW MM5-[NAM](#). I LEAN TOWARD THE [GFS](#) SOLUTION IN THIS CASE...BUT ALL MODELS SHOW ENOUGH PRECIPITATION TO JUSTIFY A [FLOOD WATCH](#) FOR OUR ENTIRE FORECAST AREA. SOME DETAILS ARE GIVEN BELOW IN THE [HYDROLOGY](#) SECTION. THERE WILL ALSO BE SOME WIND THIS WEEKEND BUT NOTHING DRAMATIC.

ON MONDAY A COOLER [AIR MASS](#) WILL START MOVING INTO WESTERN WASHINGTON AS A DEEP UPPER [TROUGH](#) DIGS INTO THE OFFSHORE WATERS OF BRITISH COLUMBIA. A WEAK [SHORTWAVE](#) AHEAD OF THE UPPER [TROUGH](#) WILL BRING SOME SHOWERS TO THE FORECAST AREA. MODELS HAVE BEEN CONSISTENTLY SHOWING A STRONG [JET](#) -- MAYBE 170 [KT JET](#) -- REACHING THE BASE OF THE [TROUGH](#)...CAUSING AN INSTANT OCCLUSION TO DEVELOP AND MOVE INTO WESTERN WASHINGTON MONDAY NIGHT.

THIS WILL BE A VIGOROUS FEATURE ITSELF. THE SNOW LEVEL WILL BE FALLING TO AROUND 3000 [FT](#) MONDAY NIGHT...SO IT WILL NOT RENEW OR WORSEN FLOODING. IT WILL BRING RAIN AND SOME WIND TO THE LOWLANDS THOUGH...AND IT SHOULD BE A GOOD SNOW PRODUCER FOR THE MOUNTAINS. SCHNEIDER

.LONG TERM...PREVIOUS DISCUSSION...MODELS DIFFER SOMEWHAT ON DETAILS...ESPECIALLY WITH RESPECT TO TIMING OF FEATURES BEYOND TUESDAY. CONFIDENCE IS FAIRLY HIGH HOWEVER THAT TUESDAY THROUGH FRIDAY WILL BE RATHER COOL WITH A PROGRESSIVE PATTERN BRINGING OCCASIONAL [SHORTWAVE](#) FEATURES THROUGH THE REGION. ONE OF THESE SYSTEMS WILL PROBABLY MOVE THROUGH WEDNESDAY NIGHT...AND SOME DRYING IS HINTED AT FOR THURSDAY NIGHT AND FRIDAY. MCDONNAL

&&

.[HYDROLOGY](#)...NO SURPRISES WITH THE NEW MODELS COMING IN THIS

MORNING. THE LEADING EDGE OF THE WARM FRONTAL LIGHT RAIN HAS STARTED TO MOVE INTO FAR SOUTHWEST WASHINGTON THIS MORNING AND WILL CONTINUE TO SPREAD NORTH ACROSS WESTERN WASHINGTON TODAY. EVERYTHING APPEARS TO BE ON TRACK. THE PREVIOUS [HYDROLOGY](#) DISCUSSION IS STILL VALID AND FOLLOWS. SCHNEIDER

MODEL RUNS CONTINUE TO SUPPORT A [FLOOD WATCH](#) FOR OUR ENTIRE FORECAST AREA...WITH AN EPISODE OF HEAVY RAIN AND HIGH SNOW LEVELS TONIGHT THROUGH SUNDAY NIGHT. THE HEAVIEST RAIN WILL PROBABLY OCCUR TONIGHT AND SUNDAY...AS A WARM [FRONT](#) MOVES NORTHWARD ACROSS WESTERN WASHINGTON AND THEN A BAROCLINIC BAND HANGS OVER THE AREA. THE ASSOCIATED COLD [FRONT](#) WILL MOVE ACROSS THE AREA FROM THE NORTHWEST SUNDAY AFTERNOON AND EVENING WITH MORE HEAVY RAIN...THOUGH PROBABLY NOT AS HEAVY AS WITH THE WARM [FRONT](#). THE EPISODE COULD CONTINUE INTO MONDAY MORNING FOR JUST THE SOUTHERN PORTION OF THE CASCADES IN OUR FORECAST AREA.

WHILE ADDITIONAL RAIN IS IN THE FORECAST MONDAY AND BEYOND...THE AMOUNTS ARE NOT EXPECTED TO BE HYDROLOGICALLY SIGNIFICANT AND THE SNOW LEVEL WILL BE FALLING.

PRECIPITATION AMOUNTS FOR TONIGHT THROUGH SUNDAY NIGHT WILL BE MAINLY 1 TO 3.5 INCHES OVER THE LOWLANDS...WITH 4 TO 9 INCHES OVER THE MOUNTAINS. THE SNOW LEVEL WILL CLIMB INTO THE 7000 TO 8000 FOOT RANGE TONIGHT. THE [GFS](#)...UW WRF-[GFS](#)...AND EUROPEAN MODELS SHOW THE HEAVIEST RAIN SLIGHTLY FURTHER NORTH THAN THE [NAM](#) AND UW MM5-[NAM](#). HOWEVER...AS MENTIONED ABOVE...ALL MODELS JUSTIFY A [FLOOD WATCH](#) FOR OUR ENTIRE FORECAST AREA. THE MOST [FLOOD](#)-PRONE RIVERS IN WESTERN WASHINGTON COULD [FLOOD](#) IN THIS EVENT...WHETHER FLOWING OUT OF THE OLYMPICS...OFF THE WEST SLOPES OF THE CASCADES...OR IN THE CHEHALIS [BASIN](#).

IN ADDITION...IT IS NOT JUST THE [MAIN STEM](#) RIVERS THAT ARE [FLOOD](#) RISKS. LOCAL FLOODING FROM SMALL STREAMS AND [URBAN FLOODING](#) OF LOW LYING STREETS IS ALSO POSSIBLE...AND THIS COULD HAPPEN ALMOST ANYWHERE IN WESTERN WASHINGTON.

FINALLY...SOME OF THE [NAM](#) AND UW WRF-[NAM](#) RUNS HAVE SHOWN 4 INCHES OF RAIN IN A 24 HOUR PERIOD OVER THE HOWARD HANSON [DAM](#) CATCHMENT. HOWEVER RECENT MODELS HAVE TRENDED LOWER WITH THESE FORECASTS. IT MUST BE NOTED THERE IS GREAT UNCERTAINTY IN THE [RAINFALL](#) FORECAST...UT THERE IS DEFINITELY A CHANCE OF HEAVY RAIN OVER THE UPPER GREEN RIVER [BASIN](#). MCDONNAL

&&

.AVIATION...A WARM [FRONT](#) WILL SWEEP NORTH ACROSS MOST OF THE AREA THIS EVENING WITH GRADUALLY LOWERING CEILINGS AND VISIBILITIES LATER TODAY. THIS [FRONT](#) WILL STALL NEAR THE NORTHER BORDER INTO EARLY SUNDAY THEN MOVE SOUTHEAST AS A COLD [FRONT](#) LATER SUNDAY.

IN ADVANCE OF THE WARM [FRONT](#) TONIGHT WOULD EXPECT THE CEILINGS TO DROP BELOW 1000 [FT](#) MANY AREAS WITH VISIBILITIES 1-3 [NM](#) COMMON. THE RAIN ASSOCIATED WITH THIS [FRONT](#) WILL BE HEAVY AT TIMES LATE TODAY INTO TONIGHT. SOUTHERN TERMINALS LIKE KHQM...KOLM COULD IMPROVE TOWARD SUNDAY MORNING WITH THE [FRONT](#) LIFTING NORTH. IF IT OCCURS IT WILL BE SHORT LIVED AS THE COLD [FRONT](#) WILL DESCEND ON THOSE AREAS DURING THE DAY SUNDAY. SOUTHERLY WINDS WILL INCREASE BEHIND THE WARM [FRONT](#) AND IN ADVANCE OF THE COLD [FRONT](#) LATE TONIGHT THROUGH SUNDAY. CERNIGLIA

KSEA...EXPECT LIGHT E/SE [FLOW](#) TODAY WITH LOWERING CLOUDS. LIGHT LIGHT RAIN WILL DEVELOP BY 20Z AND BECOME HEAVY AT TIMES [AFT](#) 03Z. [VFR](#) CIGS...DROPPING TO [MVFR](#) 20Z-22Z AND TO [IFR](#) [AFT](#) 04Z WITH [MVFR-IFR](#) VISIBILITIES AFTER 00Z. CERNIGLIA

&&

.MARINE...OFFSHORE [FLOW](#) WILL INCREASE ACROSS W WA TODAY AS A STRONG WARM [FRONT](#) APPROACHES. THIS [FRONT](#) WILL BEGIN TO LIFT NORTH THROUGH THE AREA THIS AFTERNOON WITH STRONG SOUTHERLY WINDS DEVELOPING ACROSS THE [COASTAL WATERS](#) AFTER THE [FRONT](#) PASSES. THE WINDS OVER THE [COASTAL WATERS](#) ARE EXPECTED TO REACH [GALE](#) FORCE AND I HAVE UPGRADED THE [GALE WATCH](#) TO A [GALE WARNING](#). CURRENTLY WE HAVE A [SMALL CRAFT ADVISORY](#) FOR THE WEST ENTRANCE OF JUAN DE FUCA AS EASTERLY BUT WILL NEED TO [WATCH](#) THIS AS THE [PRES GRADIENT](#) MAXES AT -5.1 KUIL-KBLI.

SLY WINDS INCREASE ON SUN AS THE BAROCLINIC BAND STALLS OVER W WA WITH GUSTY WINDS INTERIOR. MAY SEE [SCA](#) WINDS IN PUGET SOUND/HOOD CANAL. THE COLD [FRONT](#) WILL PUSH [TROUGH](#) THE AREA SUN AFTERNOON OR EARLY EVENING. ANOTHER COLD [FRONT](#) WILL AFFECT W WA MON NIGHT INTO TUE...KEEPING THE PATTERN [ACTIVE](#). CERNIGLIA

&&

.[AVALANCHE](#)...HEAVY PRECIPITATION HAS BEGUN OVER THE MT HOOD AREA AND

IS EXPECTED TO LIFT TO THE CASCADES THROUGH THE DAY ALONG WITH SIGNIFICANT WARMING...ESPECIALLY TONIGHT. SNOW SHOULD CHANGE TO RAIN BY LATE SATURDAY IN MOST AREAS WITH THE EXCEPTION OF THE CASCADE PASSES DUE TO COOL EASTERLY SURFACE [FLOW](#). THE [CREST](#) LEVEL WINDS SHOULD BE VERY STRONG BY LATE SATURDAY AS WELL.

THIS WEATHER IS EXPECTED TO PRODUCE A SIGNIFICANT [AVALANCHE](#) CYCLE CAUSING A HIGH DANGER THROUGHOUT THE OLYMPICS AND CASCADES...ESPECIALLY SATURDAY NIGHT AND INTO SUNDAY. THE HIGH DANGER IS INITIALLY EXPECTED AT MT HOOD STARTING SATURDAY AFTERNOON AND IN THE OLYMPICS AND WASHINGTON CASCADES STARTING SATURDAY NIGHT. AN [AVALANCHE WARNING](#) IS BEING ISSUED SATURDAY MORNING TO HIGHLIGHT THE INCREASING DANGER. PLEASE VISIT WWW.NWAC.US FOR DETAILS. KRAMER

&&

.SEW WATCHES/WARNINGS/ADVISORIES...

WA...[FLOOD](#) WATCHES AND/OR WARNINGS FOR PORTIONS OF THE FORECAST AREA.

.[WINTER WEATHER ADVISORY](#) FOR THE NORTH AND CENTRAL CASCADES.
. [AVALANCHE WATCH](#) FOR THE WESTERN SLOPES OF THE CASCADES.

PZ...[SMALL CRAFT ADVISORY](#) COAST...STRAIT OF JUAN DE FUCA...
ADMIRALTY INLET AND NORTHERN INLAND WATERS.

.[GALE WARNING COASTAL WATERS](#) TONIGHT THROUGH SUNDAY MORNING.
. [SMALL CRAFT ADVISORY](#) FOR ROUGH GRAYS HARBOR [BAR](#) CONDITIONS.


\$\$

FOR AN ILLUSTRATED VERSION OF THE FORECAST DISCUSSION...PLEASE SEE WWW.WEATHER.GOV/SEATTLE/GAFD/LATEST_WEBAFD.HTML.

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Your National Weather Service forecast

Bremerton WA




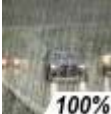


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NWS Seattle, WA
Point Forecast: Bremerton WA
 47.56°N 122.62°W (Elev. 0 ft)

[Mobile Weather Information](#) | [En Español](#)
Last Update: 6:34 am PST Dec 11, 2010
Forecast Valid: 10am PST Dec 11, 2010-6pm PST Dec 17, 2010

Forecast at a Glance

Today	Tonight	Sunday	Sunday Night	Monday	Monday Night	Tuesday	Tuesday Night	Wednesday
								
80%	100%	100%	80%	60%	80%	70%		
Rain	Heavy Rain	Heavy Rain	Showers	Showers Likely	Rain	Showers Likely	Showers Likely	Rain Likely
Hi 47 °F Lo 47 °F	Lo 46 °F	Hi 55 °F	Lo 47 °F	Hi 52 °F	Lo 44 °F	Hi 47 °F	Lo 39 °F	Hi 44 °F

Detailed 7-day Forecast

Detailed Point Forecast [Move Down]

Hazardous weather condition(s):

Flood Watch
Short Term Forecast

Today: Rain. High near 47. Calm wind becoming north between 5 and 8 mph. Chance of precipitation is 80%.

Tonight: Rain. The rain could be heavy at times. Low around 46. South wind between 7 and 13 mph. Chance of precipitation is 100%.

Sunday: Rain. The rain could be heavy at times. High near 55. South southwest wind around 18 mph. Chance of precipitation is 100%.

Sunday Night: Showers, mainly before 4am. Low around 47. South southwest wind between 7 and 10 mph. Chance of precipitation is 80%.

Monday: Showers likely, mainly after 10am. Cloudy, with a high near 52. South southwest wind around 9 mph. Chance of precipitation is 60%.

Monday Night: Rain. Low around 44. Chance of precipitation is 80%.

Tuesday: Showers likely. Cloudy, with a high near 47. Chance of precipitation is 70%.

Tuesday Night: Showers likely. Cloudy, with a low around 39.

Wednesday: Rain likely. Cloudy, with a high near 44.


Wednesday Night: Showers likely. Mostly cloudy, with a low around 39.

Thursday: Rain likely. Cloudy, with a high near 43.



Thursday Night: Rain likely. Mostly cloudy, with a low around 38.

Friday: Rain likely. Mostly cloudy, with a high near 44.

Click Map for Forecast [Disclaimer](#)

 Requested Location
Lat/Lon: 47.56°N 122.62°W **Elevation:** 0 ft

Forecast Area

Current Conditions [Move Up]

Bremerton, Bremerton National Airport
 Last Update on 11 Dec 9:15 PST

Partly Cloudy

37°F
(3°C)

Humidity: 93 %

Wind Speed: calm

Barometer: 30.17 in (N/A mb)

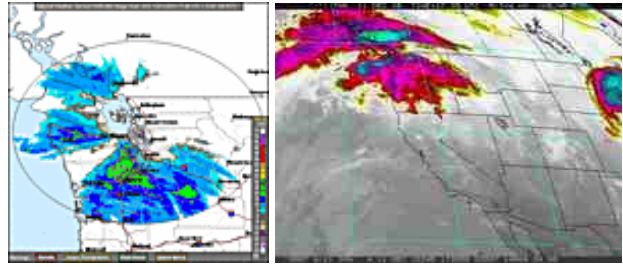
Dewpoint: 36°F (2°C)

Wind Chill: 37°F (3°C)

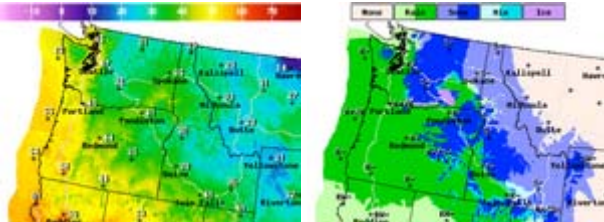
Visibility: 8.00 Miles

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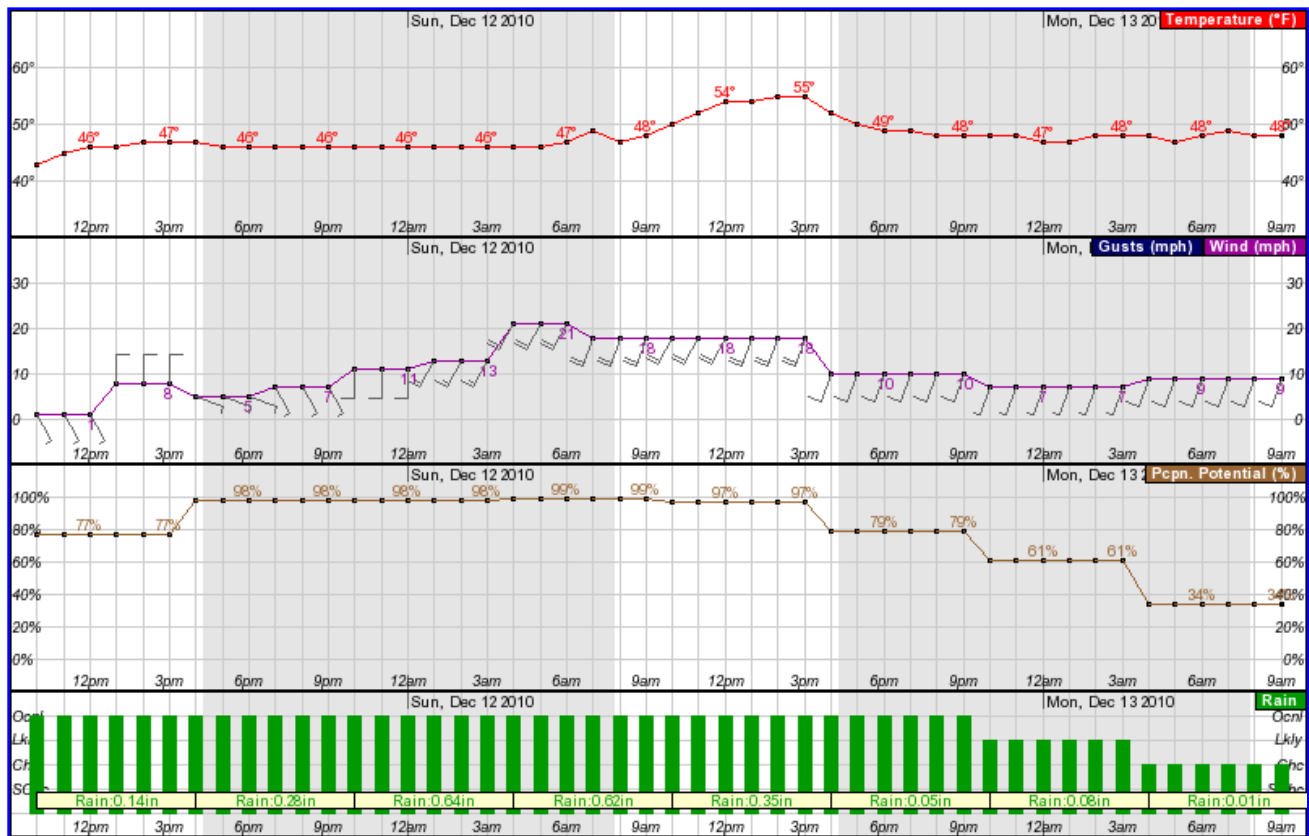
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Point Forecast: Bremerton WA
47.56N 122.62W (Elev. 0 ft)

Last Update: 6:34 am PST Dec 11, 2010

Hourly Weather Forecast Graph[\[dashes/dots\]](#) [\[b/w\]](#) [\[hide menu\]](#)

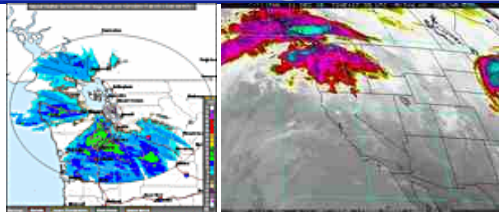
Weather Elements		Weather/Precipitation
<input checked="" type="checkbox"/> Temperature (°F)	<input checked="" type="checkbox"/> Surface Wind <input type="text" value="mph"/>	<input type="checkbox"/> Thunder
<input type="checkbox"/> Dewpoint (°F)	<input type="checkbox"/> Sky Coverage	<input checked="" type="checkbox"/> Rain
<input type="checkbox"/> Wind Chill (°F)	<input checked="" type="checkbox"/> Precipitation Potential	<input type="checkbox"/> Snow
	<input type="checkbox"/> Relative Humidity	<input type="checkbox"/> Freezing Rain
		<input type="checkbox"/> Sleet

48-Hour Period Starting: **Saturday, December 11 at 10am**

Temperature: 43 °F Surface Wind: SSE 1mph

Precipitation Potential: 77%

Rain: Occasional (80%-100%)

Radar and Satellite Images**Additional Forecasts & Information**[International System of Units](#)[Forecast Discussion](#)[7-Day Forecast](#)[Tabular Forecast](#)[Quick Forecast](#)

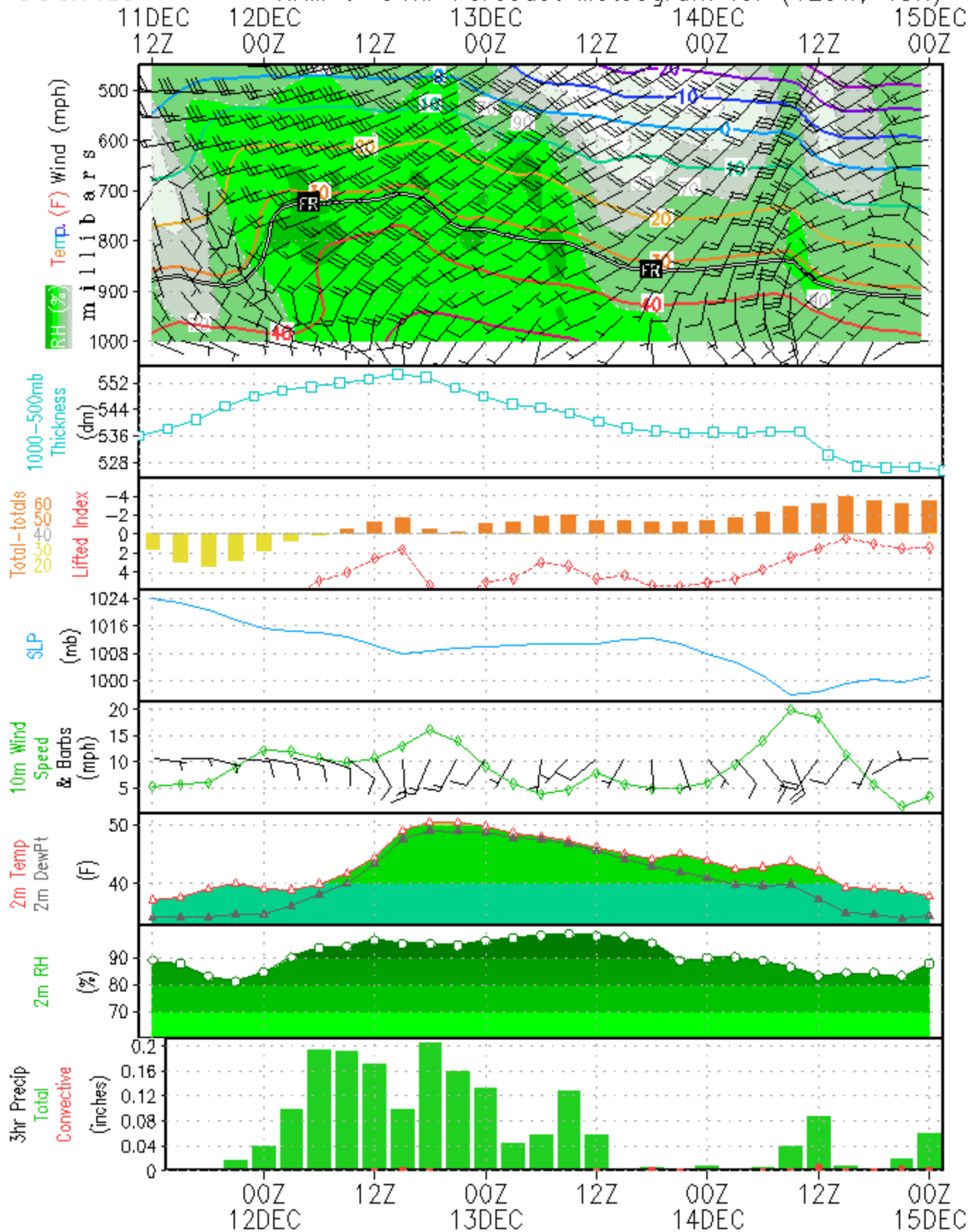
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NAM 0-84hr Forecast Meteogram for (123W, 48N)





STORM EVENT REPORT #4
For
Non-Dry Dock Stormwater Monitoring
Conducted at
Puget Sound Naval Shipyard
Bremerton, WA
Project ENVVEST Study Area

March 1, 2011



Puget Sound Naval Shipyard and Surrounding Area

PNNL Contract No.: N4523A10MP00034 Amendment 1



1.0 Introduction

Taylor/TEC conducted non-dry dock stormwater sampling tasks within the Puget Sound Naval Shipyard (PSNS) – Project ENVVEST study area between February 24th and March 2nd, 2011. This was the fourth storm event (STE) of the 2010-2011 project sampling season. The Navy refers to these efforts as Stormwater (SW) (sampling) events; consequently both the “STE” and “SW” nomenclature are used throughout this report. A summary of the events and conditions that occurred during STE#4 (SW04) are presented in this report, with supporting information as attachments.

This STE Report contains: 1) a list of the Taylor/TEC and Navy staff that participated in the event and their base roles; 2) details regarding storm event preparatory tasks; 3) weather forecast information and targeting details; 4) a precipitation and event qualification summary; 5) a sampling information, management and validation discussion; 6) basin runoff calculations; 7) descriptive statistics and discussion of the event station monitoring data; 8) notable anomalies and variations to the PWP; and 9) action items.

Attachments to this report include: Storm and Sample Information and Validation Checklist (spreadsheet), Stormwater Field Sampling Forms and Storm Controller Notes, Chain of Custody forms, basin runoff calculation worksheet, monitoring station hydrographs, autosampler operational reports and weather forecast information.

2.0 Project Staff Participating in the STE

Taylor/TEC:

Dave Metallo – Project Manager (Taylor/TEC), Storm Controller, Field Event and QC Manager

Brian Rupert – Field Team Leader

Navy Personnel:

Bob Johnston – Project Technical Lead / Oversight, Navy Field Team Leader

Eric Mollerstuen – Field Team Member

3.0 Storm Event Preparatory Tasks

After the completion of STE#3 in mid-December 2010, the project emphasis shifted to the assessment of the analytical stormwater data collected thus far. By early January 2011 results from the first three STE's were available. Together with Taylor/TEC and PNNL-MSL, the Navy decided that the monitoring equipment at the CIA stations PSNS81.1, PSNS82.5 and PSNS126 should be demobilized and moved to the NBK stations PSNS008, PSNS015 and PSNS032. Further, it was determined that the CIA station PSNS096 would remain operational and continue to collect physio-chemical and analytical data. Station relocations (phase one – CIA stations

moved to phase two – NBK stations) were planned for in the 2010-11 Scope of Work. Attributes for all the monitoring stations were included in the 2010-11 Project Work Plan (PWP). Figure 1 shows the general location of the monitoring stations at the PSNS.

By mid-January station demobilization and relocation tasks were initiated. All four of the CIA stations were demobilized. Three of the stations were slated for relocation to the NBK as stated above and PSNS096 needed to have the loaner pressure transducer, temporarily placed there back in November, removed. Taylor/TEC decided to shift the equipment from PSNS82.5 to PSNS096. Because of the vault characteristics and sedimentation issues, Taylor/TEC felt that based on recent experience, the monitoring equipment originally used at PSNS82.5, having the pressure (CS450) and conductivity (YSI6820) sensors separate from each other (the other three set-ups used a combined probe [INW CT2X] for these parameters), would be better suited for monitoring at PSNS096. Using separate sensors allowed for greater flexibility in monitoring system configuration and installation and the hope was to improve system operation and data collection. The three NBK stations were all configured with the combined INW CT2X pressure / conductivity probes.

By February 2nd, 2011 all of the phase two project monitoring stations (including PSNS096) were fully operational. Equipment blanks (SW0006 through SW0009) were collected at each station upon completion of equipment and sensor installation. The sampler lines were thoroughly backflushed with lab provided DI-water prior to equipment blank collection. A chain-of-custody form documenting the equipment blank collection is provided as an attachment.

Over the course of the following few weeks QC-assessments of the vault data (level, temperature, conductivity and salinity) from PSNS096, with its re-designed sensor configuration, noted that all parameters were being collected without incident and within expected ranges. Data assessments from the other newly installed NBK stations also revealed that parameter collection within acceptable ranges was occurring as well.

On Thursday February 24th all of the current stations were setup and readied for sample collection as Taylor/TEC began targeting a storm event forecasted for approximately March 1st. All of the stations were deemed to be functioning properly, operational and “sample ready” at this point (see Sections 1 and 2 of the attached *Stormwater Field Sampling Forms*).

All stations were programmed with pre-determined autosampler enable and pacing conditions set “high” (to prevent premature enabling) (*sample disable mode*), as directed by the Taylor/TEC Storm Controller. Station operations were passed to the Taylor /TEC Storm Controller to be managed via telemetry.

4.0 Weather Forecast Information and STE Targeting Details

Over the course of February 4.16” of rain was recorded by the Navy’s gauge atop B427. The first 8 days of the month saw about 0.25” of rain over a series of small events. The period between the 9th and 18th of the month was notably wetter with 2.51” of rainfall recorded at B427 (Navy’s gauge

within the CIA). A system that passed over the Shipyard between the 13th and 16th of the month delivered 1.88" of that 2.51". Between the 19th and 27th only 0.01" were reported. A return to a wetter pattern was seen as there was 1.40" of rain record between the 27th and 28th.

On February 28th the National Weather System (NWS)'s (<http://www.wrh.noaa.gov/sew/>) forecast for the Bremerton/PSNS area called for an organized (and project qualifying) event as a deep surface low was set to move northward through the offshore waters bringing rain and windy conditions to the area. The routinely referenced weather models used to gain forecast information regarding the Pacific Northwest, the MM5-NAM (<http://www.atmos.washington.edu/mm5rt/rt/naminit.12km.html>) and the GFS-WRF (<http://www.atmos.washington.edu/mm5rt/rt/gfsinit.frame1.html>) (both hosted by the University of WA and initialized for the PNW) were in agreement with each other for this storm event. Both models showed consistency in their predication of rain and windy conditions developing over the project area with the approaching warm front and low pressure system.

The forecasted precipitation probability was between 70-85% for approximately 0.53" depth or greater event. The NWS forecast called for rain over the project area by Tuesday night into Wednesday, with showers tapering off Thursday as a cold front moves inland. The area weather was forecasted to remain active as a series of upper level disturbances move into the region late in the week and into the weekend. Detailed weather information is provided as an attachment to this report.

Once the field crew reported the completion of their site preparatory tasks on February 24th the Taylor/TEC Storm Controller took command of station operations via telemetry. Station status was checked at various times between the 24th and March 1st. By the check of the stations at 0545 on March 1st all of the stations had reached their 6-hour no rain antecedent condition. Stations PSNS008 and PSNS015 were still over the targeted 24-hour antecedent condition of ≤ 0.1 " of rain, with 0.15" and 0.14" in the last 24-hours, respectively. However, after conversations with the Navy, it was decided to proceed with the impending sampling event because it was felt that the antecedent overage amounts would not exceed 10% of the forecasted storm event rainfall totals.

Subsequent weather and station checks later on the morning of March 1st revealed the formation of the approaching storm and spread of rain over the Shipyard. By 0730 all of the stations had recorded 0.03" to 0.04" of rain. The enable condition switches at each monitoring station were turned on and appropriately set for condition enabling (*sample ready mode*). Table 1 lists the monitoring station enabling conditions that were used for STE#4.

A check of the monitoring stations by mid-day revealed that all of the NBK stations had enabled between approximately 0945 and 1020, with rain amounts between 0.15" (PSNS032) and 0.17" (PSNS008 and PSNS015). The conductivity condition at PSNS096 remained too high for enabling – however the station remained armed. A check of PSNS096 in the early evening of the 1st revealed that it had begun sampling at 1756.

A check of each station's vault water level and hydrograph stage (see attached) showed that all were elevated above base flow conditions at the initiation of composite sampling (composite

sample enable). A check of PSNS096 also revealed that the conductivity conditions were within project parameters ($\leq 2000 \mu\text{S}/\text{cm}$) at the time it enabled. *Storm Controller notes*, which provide additional details, are attached to this report.

Table 1. Monitoring Station Enabling Conditions

Station	Rainfall (in/hr)	Level (ft)	Conductivity ($\mu\text{S}/\text{cm}$)	Repeatable Conductivity Enable (Y/N)	Pacing (min)	¹ Antecedent Period (24hr/6hr)
PSNS008	0.03	0.3	2000	N	15	² 0.15" / 0"
PSNS015	0.03	0.3	2000	N	15	² 0.14" / 0"
PSNS032	0.03	0.3	2000	Y	15	0.1" / 0"
PSNS096	0.03	0.3	2000	N	15	0.1" / 0"

¹Antecedent condition as checked b/w 0600 and 0630 on 3/1/11

²24hr antecedent dry period condition ($\leq 0.1"$) was not met; however, the overage amount was less than 10% of the overall storm event rainfall as measured at that station.

5.0 Precipitation and STE Qualification Summary

Precipitation Summary:

The previous rain event to cause runoff ($\geq 0.03"$ rainfall without 6-hr gap) prior to the onset of STE#4 ranged from 0:07:05(Days:Hours:Minutes) at PSNS096 to 0:08:05 at PSNS032, as measured by each stations rain gauge. Rain began to fall over the project site, several hours ahead of the predicted forecasted start, between 0600 and 0610 on March 1st. Light to moderate rain fell steadily from the onset of the STE until about 1900 with between 0.39" (PSNS008) and 0.33" (PSNS032) of rainfall. From approximately 1900 to 0130 on March 2nd there was an intra-event dry period. After this dry period an additional 0.27" (PSNS008) to 0.20" (PSNS015 and PSNS032) fell over the project area between approximately 0130 and 1435 (March 2nd) when the STE ended. The Navy's rain gauge at B427 recorded a very similar rainfall signature.

The storm duration ranged from about 30 (PSNS015) to 32 (PSNS096) hours. Sampling duration ranged from 17:25 (PSNS096) to 24 hours at the other stations. Sampling at PSNS096 was manually truncated at 1125 because the conductivity conditions were above the sample qualification value and would remain so for several more hours after the end of the rain.

Table 2 summarizes the rainfall amounts that occurred during the sampling period for each monitoring station as well as the PSNS rain gauge at B427 and the overall storm event depths measured at each station. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), attached to this report, provides additional storm event and sampling period rainfall information.

Table 2. Rainfall Totals for PSNS Gauge and Monitoring Stations

Station	¹ Rainfall During First Half of STE (in)	² Rainfall During Second Half of STE (in)	Sampling Period	Sampling Period Rainfall (in)	% Rainfall During Sampling Period vs. STE Period	Total Storm Event Rainfall (in)
B427	0.4	0.2	NA	NA	NA	0.60
PSNS008	.039	0.27	3/1 1018 to 3/2 1002	0.51	77	0.66
PSNS015	0.34	0.20	3/1 0947 to 3/2 0931	0.44	81	0.54
PSNS032	0.33	0.20	3/1 0947 to 3/2 0834	0.40	75	0.53
PSNS096	0.37	0.22	3/1 1756 to 3/2 1125	0.26	44	0.59

¹As defined above as the period from approximately 0600 to 1900 on 3/1/11.

²As defined above as the period from approximately 0130 to 1435 on 3/2/11.

One item of note is that although the percent of rainfall sampled verses the total amount at PSNS095 was only 44%, 100% of the amount of rainfall (0.06") that occurred during project qualifying conductivity conditions was captured during composite sampling.

STE Qualification Summary:

All storm qualification conditions were met for this event. Storm event qualification conditions included wet season event date range (Oct 1 – May 1), forecast probability ($\geq 70\%$), forecasted storm depth ($\geq 0.1"$), storm duration (≥ 2 hrs) and runoff occurrence / hydrograph stage (elevated above base flow). Antecedent dry period ($\leq 0.1"$ rain in previous 24hrs and 0" rain in previous 6hrs) qualification for this STE was conditionally met as described above. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), documents the particular STE qualification listed above.

6.0 Sampling Information, Management and Validation

Grab Sampling:

Grab sample collection was performed by the Navy Team, with storm control assistance (limited to station status checks via telemetry) from Taylor/TEC as necessary. Grab sampling was conducted at all four of the current monitoring stations. Grab samples were collected as per the 201-11 Project Work Plan (PWP). Water quality condition (conductivity and temperature) was assessed prior to the collection of the samples. Samples were collected only if conductivity was determined to be ≤ 2000 $\mu\text{S}/\text{cm}$. Samples were collected using manual methods; a laboratory cleaned stainless steel dip cup, lowered on an extension pole, used to fill the appropriate analytical containers. Parameters included total petroleum hydrocarbons (NW-TPH-Dx) and fecal

coliform. All samples were collected on March 1st between 1840 (PSNS032) and 2037 (PSNS096). Sample collection was coordinated with low or lower tidal conditions to ensure that proper conductivity conditions would exist. Grab sampling times are indicated on the attached hydrographs to illustrate the water level stage during collection. Grab sample IDs, along with the other pertinent information is listed in the *Stormwater Field Sampling Forms* and in Table A-1 (both are attached). Table 3 summarizes these results.

Table 3. Grab Sampling Details

Sample Collection Criteria:	PSNS096	PSNS032	PSNS015	PSNS008
Grab sample ID	SW04-004	SW04-002	SW04-003	SW04-001
Grab Date /Time	3/1/2011 2037	3/1/2011 1840	3/1/2011 2000	3/1/2011 1950
Grab sample conductivity value ($\mu\text{S}/\text{cm}$)	290	55	79	48
Hydrograph stage at grab collection	Intra-event runoff	Elevated runoff	Intra-event runoff	Falling limb
Grab parameters collected per PSNS PWP?	Yes	Yes	Yes	Yes

Composite Sampling:

Composite sample retrieval tasks and formulation procedures were managed by Taylor/TEC with support from PNNL/MSL personnel. Composite samples were collected from all four of the current monitoring stations.

Composite samples were collected via autosamplers which were operated and synchronized by a custom designed telemetered water quality control system. The composite sample collection period ranged from March 1st (0947) at PSNS015 and PSNS032 to (1125) at PSNS096 on the 2nd.

Methods used in preparation, autosampler collection, retrieval and formulation of the composite samples were conducted as per the PWP. Discrete time-paced samples were collected in 1000-ml plastic wedge bottles (up to 24 bottles available in each autosampler base) at a rate of 240-ml / 15 minutes (four samples/bottle, one bottle/hour) per aliquot; which, at this pacing, provides for up to 24 hours of sampling period coverage. Samplers at each station were enabled as per the conditions stated in Section 4 of this report. Each station was outfitted with either a pressure transducer (level and temperature) / conductivity (with salinity post-calculated) probe combo (INW CT2X) (PSNS008, PSNS015 and PSNS032) or a pressure transducer (level and temperature) (Campbell CS450) and a separate multi-parameter sonde (conductivity, salinity and temperature) (YSI6820) (PSNS096).

The discrete samples from each station (contained in the autosampler bases) were brought back the C106 Stormwater Lab at B147 for processing. Composite formulation occurred on March 2nd

between 1200 and 1520. Each individual discrete sample from each monitoring station was screened with bench-top meters for their conductivity (YSI 556) and turbidity (Hach 2100P) values. Bottles with conductivity values of ≤ 2000 $\mu\text{S}/\text{cm}$ were considered for inclusion in the overall composite sample; bottles testing greater than 2000 $\mu\text{S}/\text{cm}$ were discarded. Composite formulation followed the procedures as detailed in Section 8.2.5 of the PWP. Based on this screening criterion various bottles from each station qualified for use in their stations overall composite same. Enough qualifying sample volume was collected at each station to permit analysis of all intended composite sample analytes. Composite sample formulation of all the monitoring stations, except PSNS008, was conducted in a routine manner. See Section 9 of this report for details pertaining to the alternate method used for the composite formulation at PSNS008.

Composite samples parameters included: hardness, TOC, DOC, TSS, total and dissolved metals and turbidity. A small portion from each of the overall composite samples was poured off for the assessment of its resultant conductivity and turbidity values. Specific details of the composite formulation, results from individual bench top testing of the discrete bottles, as well as sample IDs, sample date/time and resultant overall conductivity and turbidity values, are detailed in the *Stormwater Field Sampling Forms* and in Table A-1 (both are attached). Table 4 summarizes these results.

Table 4. Composite Sampling Details

Sample Collection Criteria:	PSNS096	PSNS032	PSNS015	PSNS008
Composite sample ID	SW04-005	SW04-006	SW04-008	SW04-007
Composite Date /Time	3/1/2011 2340	3/2/2011 0834	3/2/2011 0931	3/2/2011 1002
Overall Composite conductivity value ($\mu\text{S}/\text{cm}$)	306	172	258	107
Composite volume (ml)	3600	4500	8000	6500
Composite parameters collected per PSNS PWP?	Yes	Yes	Yes	Yes

All sampling and vault monitoring equipment operated as designed and programmed. Details pertaining to autosampler programming and event-specific operation of each monitoring station autosampler unit are contained in the attached *Sampler Reports*.

QC Samples:

No quality control samples were collected during STE#4. As previously mentioned in Section 3 of this report, field equipment blank samples were collected at each of the current monitoring stations prior to the start of STE#4.

Sample Management:

All samples were handled and managed as per Section 9 of the PWP and in a manner acceptable and within industry standards regarding practices typical for tasks of this nature. Once collected, both grab and composite samples were placed into coolers and put on ice and/or into the Stormwater Laboratory refrigerator to maintain temperatures between 2 and 6 °C.

All sample IDs, collection date and time, matrix, requested parameter analysis and other associated information were documented on *Chain-of-Custody (CoC) forms* (attached). Samples were in direct control of project and/or laboratory personnel at all times. Samples were delivered to the testing facility, Battelle Marine Science Laboratory in Sequim, WA, in good, useable and properly chilled condition. Adequate sample volume was collected from the targeted stations to proceed with the scheduled analysis of all parameters per the 2010-11 PWP.

Sample Validation Summary:

All sample validation criteria were met for this event per Section 8.2.6 of the 2010-11 PWP. Prior to processing the samples and transferring custody to the analytical laboratory, the Taylor/TEC Field Event Lead validated the samples against certain criteria. These validation criteria included runoff occurrence / hydrograph stage, sample preparation and handling review, requested parameters, ≥2 hour sampling duration or 75% storm hydrograph coverage, minimum number of aliquots, minimum sample volume collected for required parameters, discrete and composite samples conductivity measurement results, quality control sample collection and anomalous conditions assessment. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), documents the particular STE qualification listed above.

7.0 Basin Runoff Calculations

Rainfall runoff volumes were calculated for each of the basins associated with the current monitoring stations. These calculations are based on the Runoff Coefficient Method as described in Section 7.4 of the 2010-11 PWP. Table 5 summarizes the results from these calculations.

Table 5. Monitoring Station Runoff Volume Calculations

Station	Combined Drainage Area (Ft ²)	STE Rain Total (In)	STE Rain Total (Ft)	STE Runoff Vol. (Gal)	Sample Event Rain Total (In)	Sample Event Rain Total (Ft)	Sample Event Runoff Vol. (Gal)	% of Runoff Sampled During STE
PSNS008	429,637	0.66	0.0550	176,765	0.51	0.0425	136,591	77
PSNS015	2,411,321	0.54	0.0450	811,707	0.44	0.0367	661,391	81
PSNS032	184,658	0.53	0.0442	61,009	0.40	0.0333	46,045	75
PSNS096	635,317	0.59	0.0492	233,665	0.26	0.0217	102,971	44

8.0 Descriptive Statistics and Discussion of the Event Station Monitoring Data

Descriptive statistics for the sampling period at each monitoring station are provided in Table 6, below. These statistics include minimum, maximum, average and median for 5-minute interval rainfall data, vault level, conductivity, salinity, transducer water temperature, YSI water temperature (PSNS096 only) and tidal stage. Sampling period rainfall totals, as well as maximum 1-hour intensity and average 1-hour intensity (includes intra-event dry periods) are also included as part of each station's rainfall information.

Table 6. Sampling Period Rainfall and Vault Parameter Descriptive Statistics

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (μS/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
PSNS008 min	0			0.00	0	2	4.29		0.50
max	0.02			2.74	45942	42	9.11		12.00
average	0.002			0.56	6451	10	6.60		6.98
median	0.000			0.22	41	2	6.58		7.50
total	0.51	0.06	0.021						
PSNS015 min	0			0.18	39	2	4.78		0.50
max	0.01			8.48	45497	42	9.68		12.00
average	0.002			4.00	7795	9	7.01		7.00
median	0.000			4.17	243	2	7.18		7.50
total	0.44	0.06	0.018						
PSNS032 min	0			0.00	3	2	4.68		0.50
max	0.01			3.32	44171	42	8.44		12.00
average	0.001			0.83	3921	5	7.07		7.05
median	0.000			0.29	23	2	7.24		7.80
total	0.4	0.06	0.017						
PSNS096 min	0			0.00	1	0	6.79	6.87	0.50
max	0.01			9.80	40418	41	12.29	13.00	12.00
average	0.001			4.53	27037	27	7.92	8.29	6.27
median	0.000			4.49	39702	40	7.13	7.16	5.90
total	0.26	0.05	0.015						

¹salinity calculation for PSNS008, 015 and 032 is based on an algorithm that has a lower range cut-off value of 2ppt. Actual field values may have been lower. PSNS096 used a conductivity probe (YSI6820) that utilized a different salinity algorithm function and thus is able to calculate lower low range salinity values.

Hydrograph Assessment:

The hydrographs (see attached) for all four monitoring stations showed very similar rainfall signatures and initial vault responses after about 0.03" to 0.04" of rainfall. With the exception of PSNS096, the first portion of rainfall (before the intra-event dry period) was enough to overcome tidal effects and keep the conductivity values below the project qualification threshold ($\leq 2000 \mu\text{S}/\text{cm}$). The rainfall that occurred after the intra-event dry period, in combination with the falling tide, was just enough to overcome the high conductivity crests (noted at all three of the NBK stations) and to permit the collection of a few more qualifying samples.

The low effective tide level at PSNS096 (2.94' MLLW) was the overriding factor in the high conductivity values noted at this station for the majority of the STE. The rainfall that occurred prior to and after the intra-event dry period (both in amount and intensity) was not enough to overcome the tidal effect at this station. In contrast, although PSNS015 has an even lower effective tide level (1.96'), its basin size (~92 acres) is much larger than PSNS096 (~16.5 acres) and consequently the difference in the amount of runoff volume generated (812 Kgal vs. 234 Kgal, respectively), and thus the available freshwater during the STE, was the overriding factor in the basin's ability to overcome the tidal effect.

Freshwater storage effects in the piping systems were barely noticeable (except at PSNS032 for a brief period about 1330 on March 1st) during this STE. Again this was mainly due to the low intensity, duration and amount of rainfall during this STE. Note of clarification to the pipe storage effect definition as previously stated in the STE#3 Report: *pipe storage effect is defined as freshwater ($\leq 2000 \mu\text{S}/\text{cm}$) that essentially becomes "stored" (or "staked") in a tidally influenced piping system during rainfall events; which is especially noted during periods when tidal stage is equal to or greater than a stations' effective tide level (tidal stage required, during non-rainfall periods, to impact the sampler line intake, typically referenced as zero'-vault level), where the vault water level may correspond (or may remain elevated as compared with tidal stage) to the rise and fall of the tide stage, but which remains notably fresh (non-saline) as indicated by corresponding conductivity / salinity data. The pipe storage effect is mainly governed by rainfall intensity, rainfall duration, rainfall amount, tide stage and each stations effective tide level. The pipe storage effect essentially prevents the saline intrusion ("saline wedge") typically associated with the tidal cycle at a particular monitoring station from reaching its non-rainfall event level.*

Grab samples were collected during the following hydrograph stages; falling limb (PSNS008), elevated runoff period (PSNS032) or intra-event runoff period (PSNS015 and 096). Conductivity values indicated that a freshwater state occurred during the grab collection periods at all of the monitoring stations. Sample marker and grab sampling indications have been applied to the hydrographs (see attached).

Telemetry System Metadata:

A review of the telemetry data collected during STE#4 indicated that PSNS008 was the only station having data collection issues associated with the vault or rain gauge sensors. These

issues were considered to be minor since system enabling and collection of qualified samples were not affected.

Review of the data from PSNS008 revealed that there were three periods from one to three hours in duration where the conductivity values became negative while hovering below 50uS/cm (which is considered to be very low salinity conditions). However, once there was even a slight shift in the salinity concentration of the incoming vault water (in correlation to tidal effects), the conductivity probe responded as designed, and thus the salinity values became positive. This was essentially a calibration refinement issue that was noted and subsequently corrected.

9.0 Notable Anomalies and Variations to the PWP

The only notable anomaly that occurred during STE#4 was a pacing issue at PSNS032. An incorrect pacing rate of 0-minutes/sample aliquot (instead of 15-minutes/sample aliquot) was set in the program controlling the sample collection parameter for this particular event. The result was that upon enabling, the sampler at PSNS032 took one sample right after the other for a short period of time. Fortunately the error was caught within the first 30-minutes of the station enabling, which effected bottles 1-9. A correction factor was applied to the pacing rate (increased to 22.5 minutes/sample aliquot or 1.5 hours/bottle) starting at bottle 10. This permitted the remaining 15 bottles (#'s 10-24) to collect water for another 22.5 hours. In total, the sampler at PSNS008 collected water samples for a period of 22 hours 47 minutes, as compared to 23 hours 45 minutes of the typical sample duration. The collection period covered by PSNS008 during STE#4 provided ample time to collect an adequate amount of representative and qualifying stormwater samples. Therefore a certain subset of bottles 1-9 were combined as one bottle and this was used in conjunction with sub-samples from the remaining bottles in the overall composite sample formulation. See the attached PSNS008 *Stormwater Field Sampling Form* for specific composite formulation details.

There were no anomalies observed that would have otherwise caused any of the STE#4 samples to be non-representative of the conditions from which they were collected. As reported above, all intended and scheduled grab and composite samples were submitted to the MSL within holding times and without incident. All support and sampling tasks, as well as collected samples, were managed as appropriate per the PWP.

10.0 Action Items

This was the first (fourth overall) of three scheduled storm events at the current monitoring stations. Routine action items include resetting (reloading with bottles, charging batteries, back flushing with DI water, etc.) all four monitoring stations and re-stocking of sampling supplies. Routine station maintenance items (e.g. sensor cleaning and calibration, rain gauge maintenance, etc.) as well as storm set-up tasks will need to be completed as necessary. Non-routine action items include trouble shooting some minor hyperterminal communication issues at PSNS032 and PSNS096. This issue has to do with the ability to download autosampler reports via telemetry.

Also, as noted above, there is a need to conduct additional calibration procedures, which may include establishment of new sensor multiplier and slope values for the conductivity sensor at PSNS008.

The current focus of the field efforts will be in maintaining proper station and equipment operational status, data and resource management and storm-tracking tasks.



Figure 1. Stormwater Monitoring Locations within the Shipyard Boundary

ATTACHMENTS

- Storm Qualification and Sample Validation Information Checklist
- Stormwater Field Sampling Forms and Controller Notes
- Chain-of-Custody Forms
- Runoff Calculation Worksheet
- Station Hydrographs
- Autosampler Reports
- Weather Forecast Information

**Table A-1. PSNS Non-Dry Dock Stormwater Monitoring Tasks
Storm and Sample Information and Validation Checklist
Stormwater Sampling Event #4 (3-1-2011)**

This form acknowledges representativeness criteria described in the project PWP.
Mark with "Yes" to acknowledge acceptable, "No" for not acceptable, "NA" or "-" if not applicable.

Storm Event Data:				
Project Storm Event (STE) #	4			
Event Forecast Probability (%)	70-85			
PSNS C106 Rain Gauge - Storm Event Total (in.)	0.60			
Rainfall and Runoff Summary:				
Last Runoff (≥ 0.03 " rainfall without 6-hr gap) Prior to STE Start (days:hrs:min)	PSNS096	PSNS0032	PSNS015	PSNS008
	0:7:05	0:8:55	0:8:15	0:8:25
Antecedent Dry Period (days: hrs: mins)	0:7:05	0:8:55	0:8:15	0:8:25
Rainfall Prior 24-hrs to Sampling Start	0.10	0.10	0.14	0.15
Rainfall Prior 6-hrs to Sampling Start	0.00	0.00	0.00	0.00
STE Start Date & Time	3/1/11 6:10	3/1/11 6:05	3/1/11 6:00	3/1/11 6:10
STE Duration (days:hrs:mins)	1:8:25	1:5:40	1:5:35	1:6:35
STE End Date & Time	3/2/11 14:35	3/2/11 11:45	3/2/11 11:35	3/2/11 12:45
Period Between Next Measureable Rain (days:hrs: mins)	0:13:15	0:13:45	0:13:15	0:12:45
Storm Event Total Rainfall (in)	0.59	0.53	0.54	0.66
Storm Event Max 1-hr Rainfall Intensity (in/hr)	0.07	0.06	0.06	0.08
Storm Event Average 1-hr Rainfall Intensity (in/hr)	0.018	0.018	0.018	0.021
Sampling Period Total Rainfall (in)	0.26	0.40	0.44	0.51
Sampling Period Max 1-hr Rainfall Intensity (in/hr)	0.05	0.06	0.06	0.06
Sampling Period Average 1-hr Rainfall Intensity (in/hr)	0.015	0.017	0.018	0.021
Runoff volume calculated for entire storm period (gallons)	233,665	61,009	811,707	176,765
Runoff volume calculated for sampling period (gallons)	102,971	46,045	661,391	136,591
Percentage of total storm runoff utilized during sampling period	44%	75%	81%	77%
Sample Collection Criteria:				
Grab sample ID	SW04-004	SW04-002	SW04-003	SW04-001
Grab Date /Time	3/1/2011 20:37	3/1/2011 18:40	3/1/2011 20:00	3/1/2011 19:50
Grab sample conductivity value ($\mu\text{S}/\text{cm}$)	290	55	79	48
Hydrograph stage at grab collection	Intra-event runoff	Elevated runoff	Intra-event runoff	Falling limb
Grab parameters collected per PSNS PWP ?	Yes	Yes	Yes	Yes
Composite sample ID	SW04-005	SW04-006	SW04-008	SW04-007
Composite Date /Time	3/1/2011 23:40	3/2/2011 8:34	3/2/2011 9:31	3/2/2011 10:02
Overall Composite conductivity value ($\mu\text{S}/\text{cm}$)	306	172	258	107
Composite volume (ml)	3600	4500	8000	6500
Composite parameters collected per PSNS PWP ?	Yes	Yes	Yes	Yes
QC Sample Summary Information:				
Grab sample duplicate ID	N/A	N/A	N/A	N/A
Grab sample duplicate date and time	N/A	N/A	N/A	N/A
Grab sample duplicate conductivity value ($\mu\text{S}/\text{cm}$)	N/A	N/A	N/A	N/A
Composite sample duplicate ID	N/A	N/A	N/A	N/A
Composite sample duplicate date and time	N/A	N/A	N/A	N/A
Was additional volume collected for MS/MSD analysis (grab, comp or both) ?	N/A	N/A	N/A	N/A
Overall Composite Duplicate conductivity value ($\mu\text{S}/\text{cm}$)	N/A	N/A	N/A	N/A
Composite Duplicate volume (ml)	N/A	N/A	N/A	N/A
Storm and Sample Validation:				
Was the targeted STE antecedent qualified per PSNS PWP? (if no, then see next line)	Yes	Yes	No	No
Was the antecedent overage amount greater than 10% of the total rain event ?	NA	NA	No	No
Was runoff occurring OR was the hydrograph at least 10% above background pipe level during grab collection ? If no, explain in summary narrative.	Yes	Yes	Yes	Yes
Were a minimum of 8 aliquots collected OR does the composite sample represent at least 75% of the stations storm event rain volume ?	Yes	Yes	Yes	Yes
Were all 1-hr sampler bottles used for the Composite sample $\leq 2000 \mu\text{S}/\text{cm}$?	Yes	Yes	Yes	Yes
Did any anomalous conditions exist that could make samples non-representative? Explain if "Yes"	No	No	No	No
Based on consideration of the information above, was the sample collected during the STE valid for project purposes ? (Y / N, composite, grab or both)	Yes-both	Yes-both	Yes-both	Yes-both

¹ If the answer to any of these questions is "No" OR indicate non-representative conditions, then these items should be explained in the Event Narrative.

Validation Check List Completed By / Date:

Pete Heltzel

Revised By / Date:

3/22/11



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

ver.020411

Station: PSNS 008	MH/CB#: 2179	Loc. Descrip. eastside of B550	Page: 1 of 2
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Section 1. Station Reset and Inspection			
Personnel: B Rupert		Weather: SNOW	
Arrival Date/Time: 11/2/24/11		done?	
Carry-over maintenance to do prior to set-up: NA			
Sampler Battery Voltage	good 12+	Changed? Y (N)	New voltage -
Modem Battery Voltage	good 12.5+	Changed? Y (N)	New voltage -
Sample Tubing & Strainer OK?	OK	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	Yes
Trans. Cable OK?	OK	Internal Sampler Tubing OK?	OK
Trans. Desiccant OK (Yes/No)	OK	Tubing Replaced? (Yes/No)	NO
Telem. Box Desiccant OK (Yes/No)	OK	Normal Smpler Program or Dup.?	Normal
Modem Status	Operational	Bottles Loaded?	Yes
Notes (including channel condition):		Lid Status?	OFF
		Backflushed with DI?	Yes
		Suction line & quick connect attached?	Yes
		Smplr Status (on/off) / last screen..	On, prgm dis.

Section 2. Storm Setup and Inspection			
Personnel: Rupert		Weather: SNOW	
Arrival Date/Time: 11/5/24/11			
Sampler Battery Voltage	12.59	Changed? Y (N)	New voltage -
Modem Battery Voltage	13.55	Changed? Y (N)	New voltage -
Sample Tubing & Strainer OK?	Yes	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	Yes
Transducer Cable OK?	Yes	Aliquot Vol. Cal'ed (Y/N & vol.)	NO / not enough water
Multi-meter Cable OK	Yes	Program Reviewed (Yes/No), Dup?	Y / Normal
Recorded Level (FT)	8.08	Lids off bottles?	Yes
Measured Level (FT)	8.08	Diagnostics/Distributor arm check?	Yes
Offset Diff (FT)	-0.58	Backflush with DI?	Yes
Level Adjusted?	Yes	Storm Reset (1, enter) Completed	Yes
Cond. Sonde Type (YSI6820 or INW-CT2X)	INW INW	Last screen... 12:14	Thu Feb 25
Cond. Sonde Cal. Info. : Recorded Val. = Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val =			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.)			

Section 3. Grab Sample Collection			
Personnel: Johnston Muller		Weather: Rainy	
Arrival Date/Time: 3/1/1847			
On Composite... (Bottle #/ Aliq #)	2 Bottles TP4	Conductivity Reading (µS/cm):	48 µS/cm
Grab Parameters Collected	Cond / Turb / TP4 / FC	Salinity Reading (PPT):	
Grab Sample ID	SW04-001	Temp. Reading (°C):	6.78 °C
Grab Date/Time	3/1/11 1950	Turbidity Reading (NTU)	11.2 NTU
Grab Dup ID	SW04-002 DM	Equipment running correctly?	Yes
Grab Dup Date/Time	3/1/11 1955 DM	Sampler Battery Voltage (Changed?):	NO
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: OK			
Storm Controller notified (Y or N/A)?	X	Grab MS/MSD Collected? Y / (N)	Ice OK? NO ice
Notes: (what meter was used for site readings, etc.)			
collected sepeate sample for COND / TURB cold in cooler			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 008 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM, BR</u>	Weather: <u>Windy, sun & rain, 40°</u>	Arrival Date/Time: <u>3-2-11 (1000)</u>	
Sampler Battery Voltage	<u>pulled</u>	Changed? Y (N) <u>(N) 538.0V</u>	New voltage <u>—</u>
Telemetry Battery Voltage	<u>12.5+</u>	Changed? Y (N) <u>(N)</u>	New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>3-1-11 (1018)</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>3-2-11 BTL 24 (1002)</u>		
Total Composite Sample Volume Collected	<u>100% in all btl's except for those listed below</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>From 4/4 BTL 10 through 3/4 BTL 16 = NL</u> <u>BTLs 11 & 16 have less than ~1/2 aliquot</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)?	<u>Normal</u>		
Storm Controller notified (Y or N/A)?	Which parameter?:	<u>NA</u>	
Notes:			
Maintenance Needed: <u>typical resets</u>			

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>D. Metello, B. Rupert</u>	Date/Time: <u>3-2-11 (1420)</u>		
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.) <u>Cond. = YSI 556 Ser. # 06J1594 cal. ed 2/28/11</u> <u>Turb. = Hach 2100P Ser. # 06070C018410 Cal. ed 2/14/11</u>			
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smpl be included in comp smpl Y/N):			
1. <u>130/51 / Yes</u>	7. <u>50/32 / Yes</u>	13. <u>empty</u>	19. <u>38,812/1 / No</u>
2. <u>30/33 / Yes</u>	8. <u>28/28 / Yes</u>	14. <u>empty</u>	20. <u>17,683/3 / No</u>
3. <u>71/27 / Yes</u>	9. <u>20/12 / Yes</u>	15. <u>empty</u>	21. <u>7300/8 / No</u>
4. <u>92/20 / Yes</u>	10. <u>27/7 / Yes</u>	16. <u>< 100 ml</u>	22. <u>766/34 / Yes</u>
5. <u>76/34 / Yes</u>	11. <u>empty (< 100 ml)</u>	17. <u>30,590 / 2 / No</u>	23. <u>93/29 / Yes</u>
6. <u>52/39 / Yes</u>	12. <u>empty</u>	18. <u>40,813 / 1 / No</u>	24. <u>119/136 / Yes</u>
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Used BTL's 1-10 & 22-24 - 500 ml from ea. = 6500 ml</u>			
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>Cond. = 107 $\mu\text{S}/\text{cm}$ Turb. = 43 NTU Vol. = 6500 ml. Analysis for PWP</u>			
Composite Sample ID & Time: <u>SW04-007 (1002) 3-2-11</u>			
Field Blank Collected? (date/time)	<u>No</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>No</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

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Station: PSNS 015	MH/CB#: A42	Loc. Descrip. SE side of MCD's drive thru	Page: 1 of 2
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Section 1. Station Reset and Inspection			
Personnel: Rupert	Weather: Snow	Arrival Date/Time: 2/24/11 1230	
Carry-over maintenance to do prior to set-up: NA			done?
Sampler Battery Voltage	12+	Changed? Y (N)	New voltage —
Modem Battery Voltage	12.5 +	Changed? Y (N)	New voltage —
Sample Tubing & Strainer OK?	Yes	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	Yes
Trans. Cable OK?	Yes	Internal Sampler Tubing OK?	Yes
Trans. Desiccant OK (Yes/No)	Yes	Tubing Replaced? (Yes/No)	NO
Telem. Box Desiccant OK (Yes/No)	Yes	Normal Smpler Program or Dup. ?	Normal
Modem Status	Operational	Bottles Loaded ?	Yes
Notes (including channel condition):		Lid Status?	OFF
		Backflushed with DI?	Yes
		Suction line & quick connect attached?	Yes
		Smplr Status (on/off) / last screen..	Prgm Dis....

Section 2. Storm Setup and Inspection			
Personnel: Rupert	Weather: SNOW	Arrival Date/Time: 12:30 2/24/11	
Sampler Battery Voltage	12.49	Changed? Y (N)	New voltage —
Modem Battery Voltage	13.56	Changed? Y (N)	New voltage —
Sample Tubing & Strainer OK?	Yes	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	Yes - OK
Transducer Cable OK?	Yes	Aliquot Vol. Cal'ed (Y/N & vol.)	Yes
Multi-meter Cable OK	Yes	Program Reviewed (Yes/No), Dup ?	Yes/normal
Recorded Level (FT)	2.10	Lids off bottles?	Yes
Measured Level (FT)	2.05	Diagnostics/Distributor arm check?	Yes
Offset Diff (FT)	.05	Backflush with DI?	Yes
Level Adjusted ?	Yes	Storm Reset (1, enter) Completed	Yes
Cond. Sonde Type (YSI6820 or INW-CT2X)	INW	Last screen... Program Dischld	12:43 24 Feb 2011
Cond. Sonde Cal. Info. : Recorded Val. =	12.43	Meas. Val. =	Diff. =
(>10% adj. offset); Offset = New Rec Val =			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.)			

Section 3. Grab Sample Collection			
Personnel: Johnston/Miller/Stein	Weather: No Rain	Arrival Date/Time: 2000	
On Composite... (Bottle # Aliq #)		Conductivity Reading (µS/cm):	79
Grab Parameters Collected COND/SAL	TPH / FC	Salinity Reading (PPT):	NA
Grab Sample ID SW04-003	SW04-005-DM	Temp. Reading (°C):	6.74
Grab Date/Time 3/1/2011	2000	Turbidity Reading (NTU)	8.82 ntu
Grab Dup ID	SW04-006-DM	Equipment running correctly?	Yes
Grab Dup Date/Time 3/1/2011	2000-DM	Sampler Battery Voltage (Changed?):	No
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: NA			
Storm Controller notified (Y or N/A)?	NA	Grab MS/MSD Collected ? Y (N)	Ice OK? Cold outside !!
Notes: (what meter was used for site readings, etc.)			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 015 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM / BR</u>	Weather: <u>Sun/rain, windy, 40°</u>	Arrival Date/Time: <u>3-2-11 (1030)</u>	
Sampler Battery Voltage	<u>pulled</u>	Changed? Y <input checked="" type="radio"/> N <input type="radio"/> <u>replace next visit</u>	New voltage <u>—</u>
Telemetry Battery Voltage	<u>12.5 +</u>	Changed? Y <input checked="" type="radio"/> N <input type="radio"/>	New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>3-1-11 (0947)</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>3-2-11 (0931) BTL 24 4/4</u>		
Total Composite Sample Volume Collected	<u>100%</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>None</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>Typical / Normal</u>			
Storm Controller notified (Y or N/A)?	Which parameter?:	<u>NA</u>	
Notes:			
Maintenance Needed: <u>Typical re-sets, Seal rubber pass-thru gasket</u>			

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>D. Metello / B. Rupert</u>	Date/Time: <u>3-2-11 (1520)</u>		
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal.info.) <u>Cond. = YSI 556 Ser.# 06J1594 cal.ed 2/28/11</u> <u>Turb. = Hach 2100P Ser.# 06070C018410 cal.ed 2/14/11</u>			
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smpl be included in comp smpl Y/N):			
1. <u>420 / 38 / Yes</u>	7. <u>90 / 28 / Yes</u>	13. <u>330 / 5 / Yes</u>	19. <u>40,018 / 1 / No</u>
2. <u>80 / 28 / Yes</u>	8. <u>100 / 26 / Yes</u>	14. <u>775 / 9 / Yes</u>	20. <u>19,750 / 5 / No</u>
3. <u>89 / 23 / Yes</u>	9. <u>98 / 28 / Yes</u>	15. <u>465 / 4 / Yes</u>	21. <u>17450 / 7 / No</u>
4. <u>155 / 21 / Yes</u>	10. <u>119 / 14 / Yes</u>	16. <u>22400 / 4 / No</u>	22. <u>10,182 / 8 / No</u>
5. <u>179 / 20 / Yes</u>	11. <u>220 / 9 / Yes</u>	17. <u>41480 / 2 / No</u>	23. <u>3240 / 18 / No</u>
6. <u>169 / 20 / Yes</u>	12. <u>220 / 6 / Yes</u>	18. <u>40,800 / 1 / No</u>	24. <u>377 / 20 / Yes</u>
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>used BTL's 1-15 + 24; 500-ml from each.</u>			
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>Cond. = 258 $\mu\text{S}/\text{cm}$ Turb. = 19 NTU Vol. = 8000 ml, Analysis for PWP</u>			
Composite Sample ID & Time: <u>SW04-008 (0931) 3-2-11</u>			
Field Blank Collected? (date/time)	<u>NO</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

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Station: PSNS 032	MH/CB#: 5691	Loc. Descrip. NW corner B514	Page: 1 of 2
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pages per station

Section 1. Station Reset and Inspection			
Personnel: Rupert	Weather: SNOW	Arrival Date/Time: 2/24/11 12:50	
Carry-over maintenance to do prior to set-up: NA			done?
Sampler Battery Voltage	See below	Changed? Y N	New voltage
Modem Battery Voltage	See below	Changed? Y N	New voltage
Sample Tubing & Strainer OK?	Yes	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	Yes
Trans. Cable OK?	Yes	Internal Sampler Tubing OK?	Yes
Trans. Desiccant OK (Yes/No)	Yes	Tubing Replaced? (Yes/No)	No
Telem. Box Desiccant OK (Yes/No)	Yes	Normal Smpler Program or Dup. ?	Normal
Modem Status	Operational	Bottles Loaded ?	Yes
Notes (including channel condition):		Lid Status?	Off
		Backflushed with DI?	Yes
		Suction line & quick connect attached?	Yes
		Smplr Status (on/off) / last screen..	See below

Section 2. Storm Setup and Inspection			
Personnel: Rupert	Weather: SNOW	Arrival Date/Time: 12:50 2/24/11	
Sampler Battery Voltage	12.43	Changed? Y (N)	New voltage
Modem Battery Voltage	12.91	Changed? Y (N)	New voltage
Sample Tubing & Strainer OK?	Yes	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	Yes
Transducer Cable OK?	Yes	Aliquot Vol. Cal'ed (Y/N & vol.)	No
Multi-meter Cable OK	Yes	Program Reviewed (Yes/No), Dup ?	Yes/Normal
Recorded Level (FT)	① = no water. NA @ +0.42	Lids off bottles?	Yes
Measured Level (FT)	NA @ 0.00	Diagnostics/Distributor arm check?	Yes
Offset Diff (FT)	NA @ -0.43	Backflush with DI?	Yes
Level Adjusted ?	NA @ Yes	Storm Reset (1, enter) Completed	Yes
Cond. Sonde Type (YSI6820 or INW-CT2X)	INW	Last screen... Program Disabled	13:26 24 Feb 2011
Cond. Sonde Cal. Info. : Recorded Val. = Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val =			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) NO cal'ed today / was done a few weeks ago			

Section 3. Grab Sample Collection			
Personnel: Johnston/Mollerstrom	Weather: Stopping Raining	Arrival Date/Time: 1835	
On Composite... (Bottle #/ Aliq #)		Conductivity Reading (µS/cm):	655
Grab Parameters Collected	COND/TURB TP4 / FL	Salinity Reading (PPT):	
Grab Sample ID	SW04-003-DM SW041002	Temp. Reading (°C):	6.84
Grab Date/Time	3/1/11 1940	Turbidity Reading (NTU)	8.52
Grab Dup ID	3/1/11 SW04-004-DM	Equipment running correctly?	Yes
Grab Dup Date/Time	3/1/11 DM 1845-DM	Sampler Battery Voltage (Changed?):	No V
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?:			
Storm Controller notified (Y or N/A)?		Grab MS/MSD Collected ? Y / (N)	Ice OK? OK
Notes: (what meter was used for site readings, etc.)			

NO Rain, low flow - Manhole blocked by pallets Had to man
manhole to get to in hole to sample



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 032 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM/BR</u>	Weather: <u>Windy, 40s, rain & sun</u>	Arrival Date/Time: <u>3-2-11 (1100)</u>	
Sampler Battery Voltage	<u>pulled</u>	Changed? Y <input checked="" type="radio"/> N <input type="radio"/> <u>next visit</u>	New voltage <u>—</u>
Telemetry Battery Voltage	<u>12.5+</u>	Changed? Y <input checked="" type="radio"/> N <input type="radio"/>	New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>No collected</u>		
Additional Dup Grab (IDs, date/time)	<u>None collected</u>		
Composite Begin Time (date/time)	<u>3-1-11 (0947)</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>3-2-11 BTL 24 4/4 (0834)</u>		
Total Composite Sample Volume Collected	<u>10 Besides BTLs listed below, all others were 100%</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>(10) 4/4 - NM, (11) 1-3 NL & NM, (14) 1/4 NM, (16) 1-4 NM, NL, (17) (18) (19) all NL, (20) 1/4 NL, (24) 4/4 NM</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)?	<u>Normal / typical</u>		
Storm Controller notified (Y or N/A)?	Which parameter?:	<u>NA</u>	
Notes: <u>** BTLs 1-9 paced @ "0" minutes, spanned a time period b/w (0947) to (1010) 2</u> <u>Re-adjusted pacing to 22.5 minutes starting @ BTL 10</u> <u>4/4 BTL #6</u>			
Maintenance Needed:	<u>Standard resets, replace smplr cable</u>		

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>D. Metello, B. Rupert</u>	Date/Time: <u>3-2-11 (1315)</u>		
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.) <u>Cond. YSI 556, Ser# 0601594 cal'd 2/28/11, Turb = Hoch 2100P Ser# 06070C018410 cal'd 2/14/11</u>			
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smplr be included in comp smplr Y/N):			
1. 1225/54 / Yes	7. 34 / 42 / Yes ^{DM}	13. 39/36 / Yes	19. empty
2. 50/52 / Yes	8. 33/40 / Yes ^{DM}	14. 36/26 / Yes	20. 26350/2 / No
3. 40/48 / Yes	9. 33/40 / Yes ^{DM}	15. 25/13 / Yes	21. 31,744/2 / No
4. 41/48 / Yes	10. 29/26 / Yes	16. ^{ONLY} 35/6 / vol. reading	22. 2360/8 / No
5. 39/40 / Yes	11. 47/32 / Yes	17. empty	23. 715/7 / Yes
6. 36/44 / Yes	12. 50/40 / Yes	18. empty	24. 276/15 / Yes
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>BTL's 1-6 (0947-1010) 83 ml from each = 500 ml</u> <u>7 = 4500 ml (approx.)</u> <u>BTL's 10-15 & 23 & 24 = 500 ml ea. = 4000 ml</u> <u>BTL's 10-24 paced at 22.5 min's, BTL's 1-6 rep a 23 min period, BTL's 7-9 (1011-1022) not used.</u>			
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>Cond. = 172 $\mu\text{S}/\text{cm}$ Turb. = 27 Vol. = ~4500 ml, Analysis per PWP</u>			
Composite Sample ID & Time: <u>SIW04-006 (0834) 3-2-11</u>			
Field Blank Collected? (date/time)	<u>No</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:

Considered
1-BTL, see below



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

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Station: <u>PSNS 096</u>	MH/CB#: <u>3878</u>	Loc. Descrip. <u>Inside CIA, S of B451</u>	Page: <u>1</u> of <u>2</u>
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Section 1. Station Reset and Inspection			
Personnel: <u>Rupert</u>		Weather: <u>Light snow</u>	
Arrival Date/Time:			
Carry-over maintenance to do prior to set-up:			done?
Sampler Battery Voltage	<u>12.37</u>	Changed? Y <input checked="" type="radio"/> N <input type="radio"/>	New voltage <u>—</u>
Modem Battery Voltage	<u>12.73</u>	Changed? Y <input checked="" type="radio"/> N <input type="radio"/>	New voltage <u>—</u>
Sample Tubing & Strainer OK?	<u>OIL</u>	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	
Trands. Cable OK?	<u>YES</u>	<u>YES</u>	
Trands. Desiccant OK (Yes/No)	<u>YES</u>	Internal Sampler Tubing OK?	
Telem. Box Desiccant OK (Yes/No)	<u>YES</u>	<u>NO</u>	
Modem Status	<u>operational</u>	Tubing Replaced? (Yes/No)	
Notes (including channel condition):		<u>Normal</u>	
		Normal Smler Program or Dup. ?	
		<u>Y</u>	
		Bottles Loaded ?	
		<u>off</u>	
		Lid Status?	
		<u>YES</u>	
		Backflushed with DI?	
		<u>YES</u>	
		Suction line & quick connect attached?	
		<u>on/ready</u>	
		Smlr Status (on/off) / last screen..	

Section 2. Storm Setup and Inspection			
Personnel: <u>Rupert</u>		Weather: <u>Light snow</u>	
Arrival Date/Time: <u>2/24/11</u>		<u>(1030)</u>	
Sampler Battery Voltage	<u>12.37</u>	Changed? Y <input checked="" type="radio"/> N <input type="radio"/>	New voltage <u>—</u>
Modem Battery Voltage	<u>12.73</u>	Changed? Y <input checked="" type="radio"/> N <input type="radio"/>	New voltage <u>—</u>
Sample Tubing & Strainer OK?	<u>OIL</u>	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	
Transducer Cable OK?	<u>YES</u>	<u>YES</u>	
Multi-meter Cable OK	<u>YES</u>	Aliquot Vol. Cal.'ed (Y/N & vol.)	
Recorded Level (FT)	<u>7.54</u>	<u>YES / normal</u>	
Measured Level (FT)	<u>7.54</u>	Program Reviewed (Yes/No), Dup. ?	
Offset Diff (FT)	<u>-0.03</u>	<u>Y</u>	
Level Adjusted ?	<u>YES</u>	Lids off bottles?	
Cond. Sonde Type (YSI6820 or INW-CT2X)	<u>YES</u>	<u>Y</u>	
Cond. Sonde Cal. Info. : Recorded Val. = <u>No Cal.</u>	Meas. Val. =	Diagnostics/Distributor arm check?	
		<u>Y</u>	
		Backflush with DI?	
		<u>YES</u>	
		Storm Reset (1, enter) Completed	
		<u>YES</u>	
		Last screen... Program disabled	
		<u>11:04 TH 24 FEB</u>	
Cond. Sonde Cal. Info. : Recorded Val. = <u>No Cal.</u> Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val =			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) <u>Y Done by Dave m. w/ Telem. 11/24/11</u>			

Section 3. Grab Sample Collection			
Personnel: <u>Johnston/Moller</u>		Weather: <u>Not Rainy</u>	
Arrival Date/Time: <u>2035</u>			
On Composite... (Bottle #/ Aliq #)		Conductivity Reading (μ S/cm):	<u>290 μS/cm</u>
Grab Parameters Collected <u>COND/SAL</u>	<u>TPH/EC</u>	Salinity Reading (PPT):	<u>—</u>
Grab Sample ID <u>SW04-004</u>	<u>SW04-007-DM</u>	Temp. Reading (°C):	<u>7.8 °C</u>
Grab Date/Time <u>3/1/2011</u>	<u>2037</u>	Turbidity Reading (NTU)	<u>11.3 NTU</u>
Grab Dup ID <u>SW04-008-DM</u>	<u>SW04-008-DM</u>	Equipment running correctly?	<u>YES</u>
Grab Dup Date/Time <u>3/1/2011-DM</u>	<u>2037-DM</u>	Sampler Battery Voltage (Changed?):	<u>NO</u>
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?:			
Storm Controller notified (Y or N/A)?		Grab MS/MSD Collected ? Y <input checked="" type="radio"/> N <input type="radio"/>	Ice OK?
Notes: (what meter was used for site readings, etc.) <u>TPH Blank Samp 3/1/2011 2050</u>			
<u>Low Flow in manhole stream flowing</u>			
<u>Bottle-sample touched tie wraps</u>			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: 046 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM, BR</u>	Weather: <u>periods of sun & rain, windy</u>	Arrival Date/Time: <u>(1130) 3-2-11</u>	
Sampler Battery Voltage	<u>pulled</u>	Changed? Y <input type="radio"/> N <input checked="" type="radio"/>	New voltage <u>—</u>
Telemetry Battery Voltage	<u>good 12.5+</u>	Changed? Y <input type="radio"/> N <input checked="" type="radio"/>	New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>no add. collected</u>		
Additional Dup Grab (IDs, date/time)	<u>no add. collected</u>		
Composite Begin Time (date/time)	<u>3-1-11 (1756)</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>3-2-11 BTL 18 3/4 (1125)</u>		
Total Composite Sample Volume Collected	<u>18 1/2 full btl's, 3/4 full btl 18 (manually stopped @ 3/4 18)</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>None missed</u>		
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>Normal / typical</u>			
Storm Contoller notified (Y or <input checked="" type="radio"/> N/A)?	Which parameter?:	<u>NA</u>	
Notes:			
Maintenance Needed: <u>typical reset tasks, check telem. smplr rpt download func.</u>			

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>D. Metello, B. Rupert</u>	Date/Time: <u>3-2-2011 (1200)</u>		
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal.info.) <u>Cond. = YSI 556, ser# 06J1594, cal'd 2/28/11</u> <u>Turb. = Hach 2100P, 06070C018410 Ser#</u> <u>cal'd 2/14/11</u>			
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in μ S/cm; turb. reading in NTU; will ind. smpl be included in comp smpl Y/N):			
<u>1.- 4650/17/No</u>	<u>7. 38,995/1/No</u>	<u>13. 40,170/1/No</u>	<u>BTLs 19-24</u>
<u>2.- 335/13/Yes</u>	<u>8. 0.81 39,100/1/No</u>	<u>14. 39,560/1/No</u>	<u>not collected</u>
<u>3. 266/9/Yes</u>	<u>9. 38,000/1/No</u>	<u>15. 38,360/1/No</u>	
<u>4. 309/8/Yes</u>	<u>10. 39,500/1/No</u>	<u>16. 38,160/2/No</u>	
<u>5. 320/6/Yes</u>	<u>11. 39,164/1/No</u>	<u>17. 39,030/1/No</u>	
<u>6. 17300/5/No</u>	<u>12. 39,350/1/No</u>	<u>18. 38,167/1/No</u>	
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, were used for the overall composite sample) <u>used btl's 2, 3, 4, 5, 6, approx 900-ml from each bottle</u> <u>5cm \rightarrow did not use btl #6, only 2-5</u>			
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>Cond. = 306 μS/cm</u> <u>Turb. = 9</u> <u>Vol. = 3600 ml</u> <u>Analysis = per PWP</u>			
Composite Sample ID & Time: <u>SW04-005 (2340) 3-1-11</u>			
Field Blank Collected? (date/time)	<u>NO</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:

Date:	2-26-2011	Sampling Support Personnel:	B. Rupert & D. Metallo (comps)
STE #	4	Tidal Info:	LL ~ 2130 3/1/11
Storm Controller:	Dave Metallo	Grab sampling Info:	B. Johnston & E. Mollerstrom (grabs) * Collected EB + Samples
Pre-Storm / Weather Details:	2-25: Some rain (~.36") Sunday - falling off Monday (.16"), then main push of Rain Tues (~.7") = target 2-26: Rain amount increased for Sun. (~.46") w/ decrease Mon. amt (0.08"), w/ Wed (~0.41") - .50") 2-26 rev. (1800) Sun = 0.33", Mon. = 0.08", Tues = 0.32", Wed. = ~0.13"		

Telemetry Measurements:	DATE/TIME (24HR)											
STATION:	2-27 ~0930	2-27 1200-02	2-27 1333	2-28 0830	Batt. Readings	3-1-11 0909			3-2-11 0720	3-2-11 ~1030		
PSNS008 Rain	0.00	0.01	0.10	1.52		0.02/.19	* Checked all		0.01/0.48	* Collected comp. samples		
PSNS008 Level		0.18	0.26	0.02		0.13	Stations severe		0.25	from all stations.		
PSNS008 Cond.		954	543	166	12.76	119	times throughout		1440	* Stopped prgm @ 096		
Smpl Marker		0	0	0	12.72	0	the day of 3/1.		85	prior to its auto-end		
PSNS015 Rain	0.00	0.01	0.08	1.29		0.02/.2	After reset of		0.01/41	(~16 hr run)		
PSNS015 Level		5.82	5.44	3.13		2.52	032 (See below)		5.79	- all stations operated		
PSNS015 Cond.		27.463	24.629	315	12.60	481	all running fine.		3121	well		
Smpl Marker		0	0	0	12.53	0	(032)		88	- Need to troubleshoot		
PSNS032 Rain	0.00	0.01	0.09	1.16		0.02/0.15	* Discovered		0.00/40	Sampler report function		
PSNS032 Level		0.96	0.60	0.51		0.34	that pacing rt.		0.52	@ 032 & 096.		
PSNS032 Cond.		43.565	212	3.18	12.56	36	was set at 0.		745			
Smpl Marker		0	0	0	12.42	0	9 bits had filled. Stopped. Reset		56			
PSNS096 Rain	0.00	0.01	0.08	1.33		0.02/0.14	pacing at 22.5		0.01/45			
PSNS096 Level		7.12	6.69	5.00		3.76	mins. @ BTL 10		6.92			
PSNS096 Cond.		40.069	39.948	39.355	12.48	39.892			40.345			
Smpl Marker		0	0	0	12.34	(2)			56			

Enabling Information:								Notes:				
Sample Station:	PSNS 008		PSNS 015		PSNS 032		PSNS 096		- Navy Ntbb in enclosure @ 032			
Rain enable (in/hr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	- Make sure salinity meter gets cal'ed			
Level Enable (ft)	20.00	0.3	20	0.3	20	0.3	20	0.3	- Jacquelyn to secure Turb. meter			
Cond. (µS/cm)	2000	2000	2000	2000	2000	2000	2000	2000	* may need to cal. an add. meter to use for turb. (grab.) on Saw if necessary			
Repeat. Cond Set ?	No	No	No	No	No	No	No	No	- Power cycled Datalogger & Modem @ 032 (~1200)			
Date	2-25	3-1-11	2-25	3-1-11	2-25	3-1-11	2-25	3-1-11	- (2/27 ~ 1200) spoke w/ Bob J. - wants to stick to plan, wait until Tues night to target			
Time	~1200	~0735	~1200	~0735	~1200	~0740	~1200	~0740	- Waited out weather through morning of 3-1-11			

* called Bob, concur w/ setting enabling ~ 0730

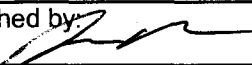

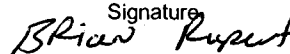
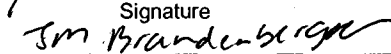
Date: _____
Page: _____ of _____
Project No.: N4523A10MP00034 Amend.1
Project: PSNSNon-dry Dock SW 2010

Marine Sciences Laboratory
1529 West Sequim Bay Road
Laboratory: Battelle MSL
Attention: Jill Brandenberger
Phone: (360) 681-4564

[illegible]

Date: _____
Page: 1 of 1
Project No.: N4523A10MP00034 Amend.1
Project: PSNSNon-dry Dock SW 2010

Marine Sciences Laboratory
1529 West Sequim Bay Road
Laboratory: Battelle MSL
Attention: Jill Brandenberger
Phone: (360) 681-4564

				Analyze parameters per QAP/FSP												Phone: (360) 681-4564		
Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	TPH	Turbidity					No. containers	Sample Type (Grab vs. Comp)	Storm#	Notes
SW04-001	PSNS 008	3-1-11 1950	SW						X						2	grab	STE #4	Grab Smp1
SW04-002	PSNS 032	↓ 1840							X						2	↓		↓
SW04-003	PSNS 015	↓ 2000							X						2	↓		↓
SW04-004	PSNS 096	↓ 2037							X						2	↓		↓
SW04-005	PSNS 096	3-1-11 2340		X	X	X	X	X	X						1	comp		Comp Cond.=306 Turb=9
SW04-006	PSNS 032	3-2-11 0834		X	X	X	X	X	X						1			Cond=172 Turb=27
SW04-007	PSNS 008	↓ 1002		X	X	X	X	X	X						1			Cond=107 Turb=43
SW04-008	PSNS 015	↓ 0931	↓	X	X	X	X	X	X						1			Cond=258 Turb=19
SW0010	EB Grab	3-1-11 2053	DI Water						X						2	grab	↓	EB-Grab @ 096
																		Note: TPH not analyzed on Comp.
																		Smp
																		3/2/11
Relinquished by:  3/2/11 1839				Received by:  3/2/11 1900												Total # of Containers: 14		
Signature:  Date: <u>3/2/11</u> Time: <u>1839</u>				Signature:  Date: <u>3/2/11</u> Time: <u>1900</u>												Shipment Method: <u>hand delivery</u>		
Printed Name: <u>Brian Rupert</u> Company: <u>TEC Inc</u>				Printed Name: <u>Jim Brandenberger</u>												Sample Disposition:		
Relinquished by:				Received by:												Distribution:		
Signature: _____ Date: _____ Time: _____				Signature: _____												1) PNNL		
Printed Name: _____ Company: _____				Printed Name: _____												2) CAS		
																3) TAI		

**PSNS NDDSW Monitoring
Stormwater Outfall Total Discharge Volume Estimation Equations**

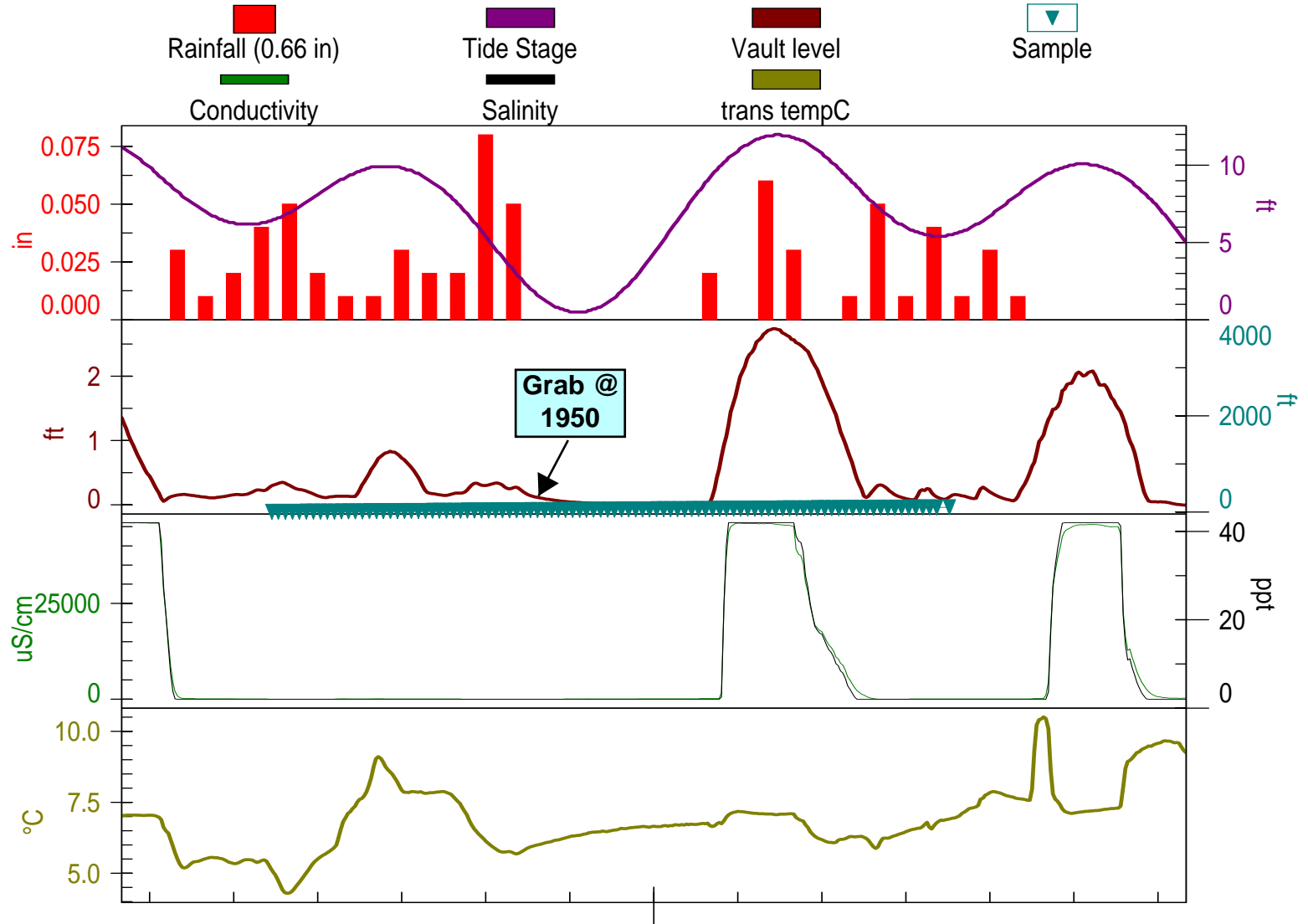
PSNS Drainage Basin	Total Basin Area (ft ²)	Type of Surface	Percentage of Drainage Basin Surface Type	Area of Basin Surface Type (ft ²)	¹ Runoff Coefficient Range	Area of Basin Surface Type with Maximum Coefficient Value Applied (ft ²)	² Total Discharge Volume (ft ³)
096	717,872	Impervious	97	696,336	0.6 – 0.9	626,702	R(635,317)
		Pervious	3	21,536	0.2 – 0.4	8,615	
032	208,653	Impervious	97	202,393	0.6 – 0.9	182,154	R(184,658)
		Pervious	3	6,260	0.2 – 0.4	2,504	
015	4,018,862	Impervious	50	2,009,431	0.5 – 0.8	1,607,549	R(2,411,321)
		Pervious	50	2,009,431	0.25 – 0.4	803,772	
008	553,650	Impervious	94	520,431	0.5 – 0.8	416,349	R(429,637)
		Pervious	6	33,219	0.2 – 0.4	13,288	

Calculation Worksheet:

STE#4 3/1/2011

STATION	Combined Drainage Area (FT ²)	ENTER: STE Rain Total (in)	STE Rain Total (FT)	STE Runoff Vol. (gal)	ENTER: Smpl Evnt Rain Total (in)	Sampl Evnt Rain Total (FT)	Sample Event Runoff Vol. (gal)
096	635,317	0.59	0.0492	233,664.63	0.26	0.0217	102,970.85
032	184,658	0.53	0.0442	61,009.08	0.40	0.0333	46,044.59
015	2,411,321	0.54	0.0450	811,706.97	0.44	0.0367	661,390.86
008	429,637	0.66	0.0550	176,764.93	0.51	0.0425	136,591.08

PSNS 008
STE#4 3-1-2011



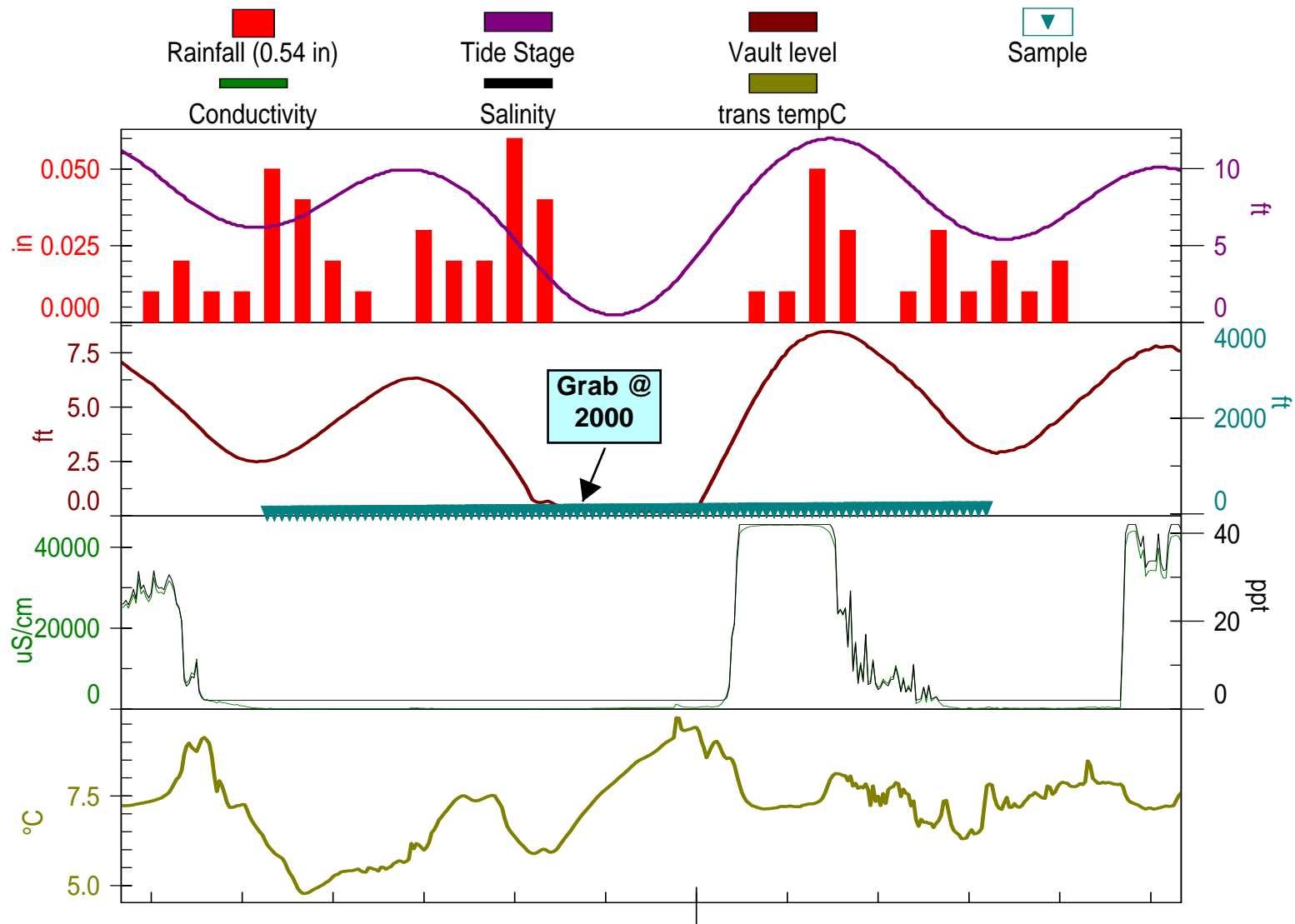
2 Wed

Mar 2011

3/1/2011 5:00:00 AM - 3/2/2011 7:00:00 PM

PSNS 015

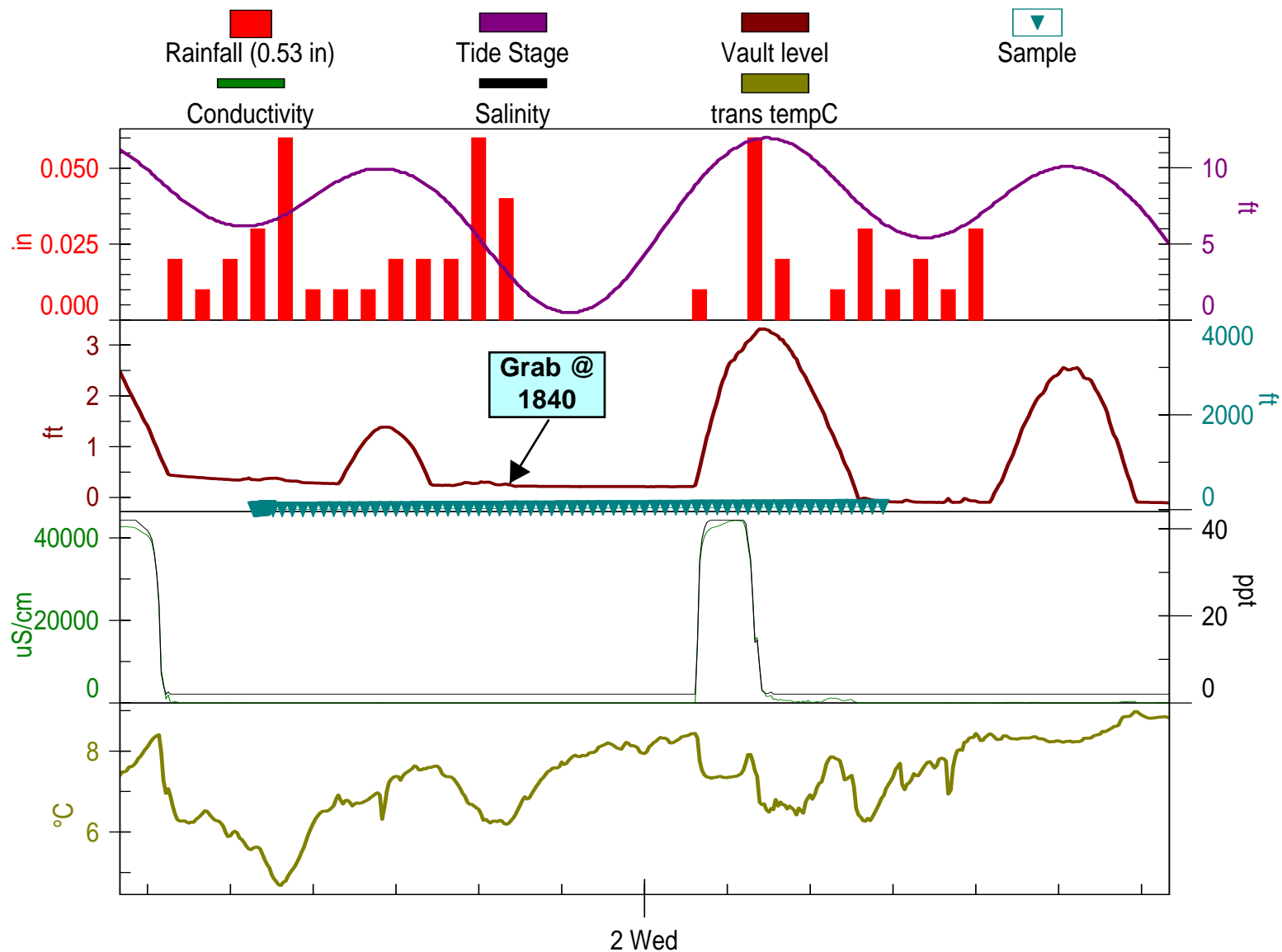
STE#4 3-1-2011



Mar 2011

2 Wed
3/1/2011 5:00:00 AM - 3/2/2011 4:00:00 PM

PSNS 032
STE#4 3-1-2011

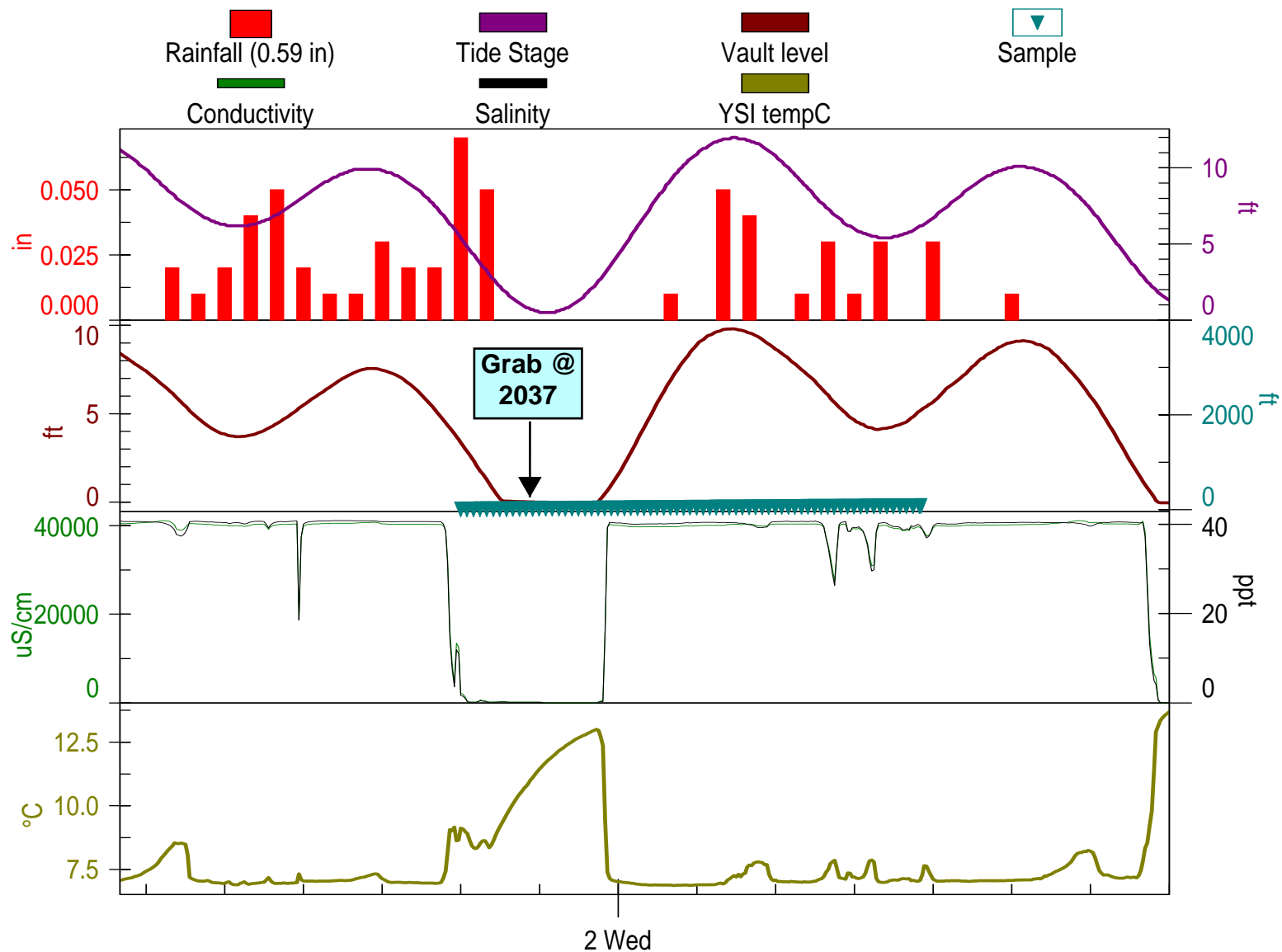


Mar 2011

3/1/2011 5:00:00 AM - 3/2/2011 7:00:00 PM

PSNS 096

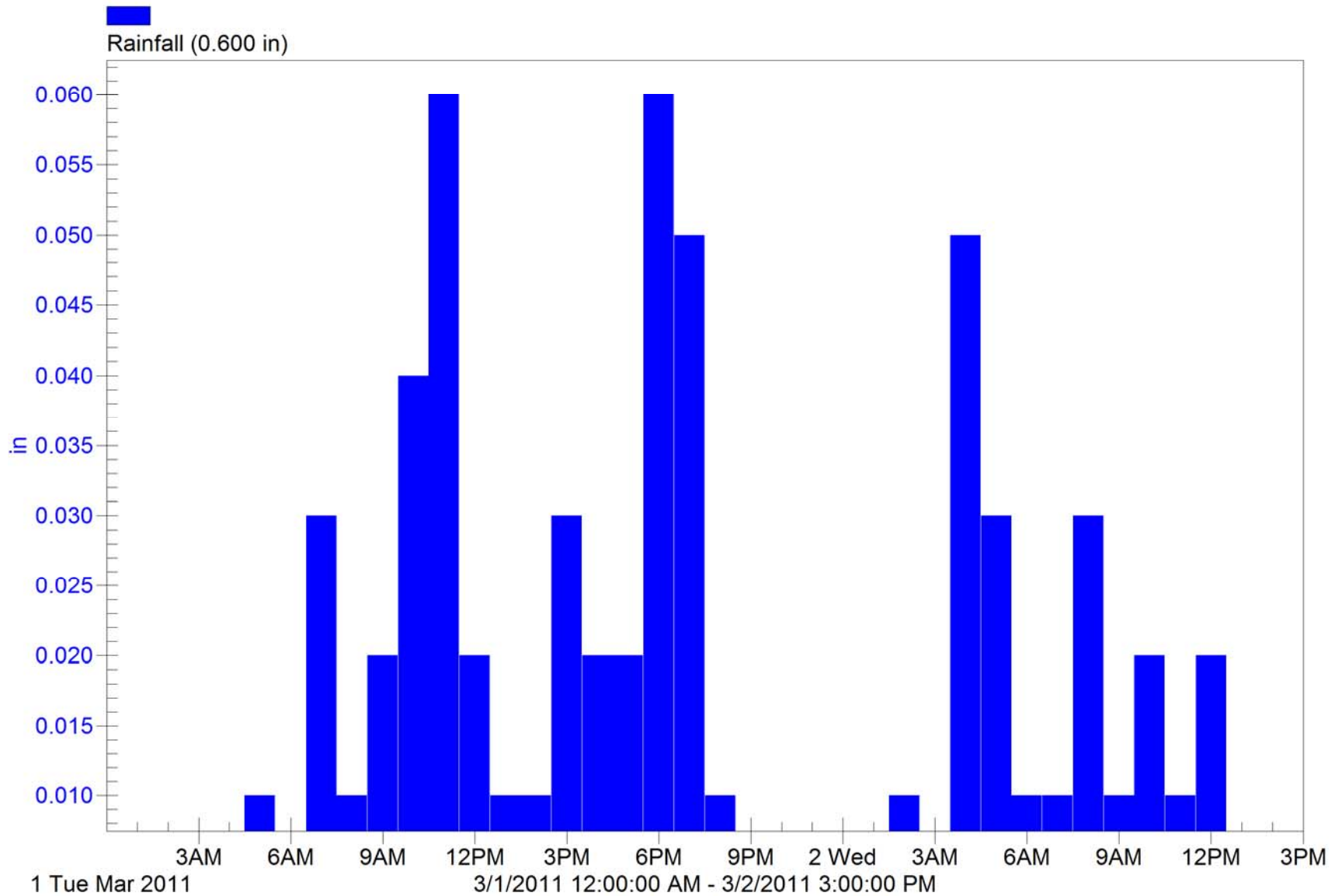
STE#4 3-1-2011



Mar 2011

3/1/2011 5:00:00 AM - 3/2/2011 9:00:00 PM

Flowlink 5



STE#4 008 smpl rpt

SAMPLER ID# 3293179321 10:28 2-MAR-11
Hardware: B2 Software: 3.26
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"PSNS008"
SITE DESCRIPTION:
"PSNS008"

UNITS SELECTED:
LENGTH: ft

24, 1000 ml BTLS
16 ft SUCTION LINE
10 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 ml SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I /01= NONE
I /02= NONE
I /03= NONE

O ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET-----
SAMPLER ID# 3293179321 10:29 2-MAR-11
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****SITE: PSNS008
PROGRAM: PSNS008
Program Started at 12:14 TH 24-FEB-11
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE ERROR	COUNT TO LIQUID

		12:14	PGM DISABLED	
		TU 01-MAR-11	-----	
		10:18	PGM ENABLED	
1,4	1	10:18	E	409
2,4	1	10:32	F	404
3,4	1	10:47	F	405
4,4	1	11:02	F	408
1,4	2	11:17	F	409
2,4	2	11:32	F	409
3,4	2	11:47	F	409

STE#4 008 smpl rpt

4, 4	2	12: 02	F	410
1, 4	3	12: 17	F	409
2, 4	3	12: 32	F	410
3, 4	3	12: 47	F	409
4, 4	3	13: 02	F	410
1, 4	4	13: 17	F	409
2, 4	4	13: 32	F	405
3, 4	4	13: 47	F	408
4, 4	4	14: 02	F	405
1, 4	5	14: 17	F	407
2, 4	5	14: 32	F	404
3, 4	5	14: 47	F	404
4, 4	5	15: 02	F	404
1, 4	6	15: 17	F	410
2, 4	6	15: 32	F	409
3, 4	6	15: 47	F	410
4, 4	6	16: 02	F	410
1, 4	7	16: 17	F	415
2, 4	7	16: 32	F	411
3, 4	7	16: 47	F	410
4, 4	7	17: 02	F	411
1, 4	8	17: 17	F	410
2, 4	8	17: 32	F	410
3, 4	8	17: 47	F	410
4, 4	8	18: 02	F	413
1, 4	9	18: 17	F	411
2, 4	9	18: 32	F	410
3, 4	9	18: 47	F	411
4, 4	9	19: 02	F	410
1, 4	10	19: 17	F	410
2, 4	10	19: 32	F	410
3, 4	10	19: 47	F	415
4, 4	10	20: 02	F	NM
1, 4	11	20: 17	F	NL
2, 4	11	20: 32	F	NL
3, 4	11	20: 47	F	NL
4, 4	11	21: 02	F	NL
1, 4	12	21: 17	F	NL
2, 4	12	21: 32	F	NL
3, 4	12	21: 47	F	NL
4, 4	12	22: 02	F	NL
1, 4	13	22: 17	F	NL
2, 4	13	22: 32	F	NL
3, 4	13	22: 47	F	NL
4, 4	13	23: 02	F	NL
1, 4	14	23: 17	F	NL
2, 4	14	23: 32	F	NL
3, 4	14	23: 47	F	NL
----- WE 02-MAR-11 -----				
4, 4	14	00: 02	F	NL
1, 4	15	00: 17	F	NL
2, 4	15	00: 32	F	NL
3, 4	15	00: 47	F	NL
4, 4	15	01: 02	F	NL
1, 4	16	01: 17	F	NL
2, 4	16	01: 32	F	NL
3, 4	16	01: 47	F	NL
4, 4	16	02: 02	F	410
1, 4	17	02: 17	F	409
2, 4	17	02: 32	F	404
3, 4	17	02: 47	F	404
4, 4	17	03: 02	F	403
1, 4	18	03: 17	F	399

STE#4 008 smpl rpt

2, 4	18	03: 32	F	398
3, 4	18	03: 47	F	399
4, 4	18	04: 02	F	398
1, 4	19	04: 17	F	397
2, 4	19	04: 32	F	398
3, 4	19	04: 47	F	403
4, 4	19	05: 02	F	398
1, 4	20	05: 17	F	398
2, 4	20	05: 32	F	401
3, 4	20	05: 47	F	403
4, 4	20	06: 02	F	403
1, 4	21	06: 17	F	403
2, 4	21	06: 32	F	404
3, 4	21	06: 47	F	408
4, 4	21	07: 02	F	409
1, 4	22	07: 17	F	410
2, 4	22	07: 32	F	410
3, 4	22	07: 47	F	413
4, 4	22	08: 02	F	410
1, 4	23	08: 17	F	409
2, 4	23	08: 32	F	410
3, 4	23	08: 47	F	409
4, 4	23	09: 02	F NM	*
1, 4	24	09: 17	F	410
2, 4	24	09: 32	F	409
3, 4	24	09: 47	F	410
4, 4	24	10: 02	F	405
		10: 03	PGM DONE	02-MAR

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW
 ERROR NL ==> NO LI QUI D DETECTED!
 ERROR NM ==> NO MORE LI QUI D!

STE#4 015 smpl rpt

SAMPLER ID# 2425481222 10:38 2-MAR-11
Hardware: B2 Software: 3.26
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"PSNS015"
SITE DESCRIPTION:
"PSNS015"

UNITS SELECTED:
LENGTH: ft

24, 1000 ml BTLS
22 ft SUCTION LINE
18 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 ml SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

STE#4 015 smpl rpt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I /01= NONE
I /02= NONE
I /03= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 2425481222 10:38 2-MAR-11
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS015
PROGRAM: PSNS015
Program Started at 12:46 TH 24-FEB-11
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE ERROR	COUNT TO LIQUID

12:46			PGM DISABLED	

TU 01-MAR-11			PGM ENABLED	

1,4	1	09:47	E	779
2,4	1	10:01	F	776
3,4	1	10:16	F	773
4,4	1	10:31	F	773
1,4	2	10:46	F	771
2,4	2	11:01	F	775
3,4	2	11:16	F	765

STE#4 015 smpl rpt

4, 4	2	11: 31	F	764
1, 4	3	11: 46	F	760
2, 4	3	12: 01	F	763
3, 4	3	12: 16	F	754
4, 4	3	12: 31	F	749
1, 4	4	12: 46	F	745
2, 4	4	13: 01	F	750
3, 4	4	13: 16	F	748
4, 4	4	13: 31	F	744
1, 4	5	13: 46	F	744
2, 4	5	14: 01	F	745
3, 4	5	14: 16	F	738
4, 4	5	14: 31	F	737
1, 4	6	14: 46	F	739
2, 4	6	15: 01	F	741
3, 4	6	15: 16	F	743
4, 4	6	15: 31	F	755
1, 4	7	15: 46	F	750
2, 4	7	16: 01	F	752
3, 4	7	16: 16	F	754
4, 4	7	16: 31	F	760
1, 4	8	16: 46	F	762
2, 4	8	17: 01	F	772
3, 4	8	17: 16	F	774
4, 4	8	17: 31	F	778
1, 4	9	17: 46	F	791
2, 4	9	18: 01	F	799
3, 4	9	18: 16	F	804
4, 4	9	18: 31	F	823
1, 4	10	18: 46	F	821
2, 4	10	19: 01	F	824
3, 4	10	19: 16	F	841
4, 4	10	19: 31	F	835
1, 4	11	19: 46	F	864
2, 4	11	20: 01	F	828
3, 4	11	20: 16	F	829
4, 4	11	20: 31	F	832
1, 4	12	20: 46	F	832
2, 4	12	21: 01	F	832
3, 4	12	21: 16	F	829
4, 4	12	21: 31	F	847
1, 4	13	21: 46	F	847
2, 4	13	22: 01	F	834
3, 4	13	22: 16	F	832
4, 4	13	22: 31	F	835
1, 4	14	22: 46	F	832
2, 4	14	23: 01	F	834
3, 4	14	23: 16	F	834
4, 4	14	23: 31	F	834
1, 4	15	23: 46	F	832
----- WE 02-MAR-11 -----				
2, 4	15	00: 01	F	823
3, 4	15	00: 16	F	809
4, 4	15	00: 31	F	799
1, 4	16	00: 46	F	790
2, 4	16	01: 01	F	780
3, 4	16	01: 16	F	778
4, 4	16	01: 31	F	767
1, 4	17	01: 46	F	760
2, 4	17	02: 01	F	751
3, 4	17	02: 16	F	743
4, 4	17	02: 31	F	742
1, 4	18	02: 46	F	731

STE#4 015 smpl rpt

2, 4	18	03: 01	F	730
3, 4	18	03: 16	F	731
4, 4	18	03: 31	F	728
1, 4	19	03: 46	F	725
2, 4	19	04: 01	F	726
3, 4	19	04: 16	F	723
4, 4	19	04: 31	F	727
1, 4	20	04: 46	F	718
2, 4	20	05: 01	F	728
3, 4	20	05: 16	F	724
4, 4	20	05: 31	F	733
1, 4	21	05: 46	F	733
2, 4	21	06: 01	F	733
3, 4	21	06: 16	F	738
4, 4	21	06: 31	F	741
1, 4	22	06: 46	F	743
2, 4	22	07: 01	F	749
3, 4	22	07: 16	F	751
4, 4	22	07: 31	F	754
1, 4	23	07: 46	F	761
2, 4	23	08: 01	F	763
3, 4	23	08: 16	F	766
4, 4	23	08: 31	F	773
1, 4	24	08: 46	F	775
2, 4	24	09: 01	F	781
3, 4	24	09: 16	F	786
4, 4	24	09: 31	F	787
09: 31 PGM DONE 02-MAR				

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW

STE #4 032 smpl rpt

SAMPLER ID# 2483481595 10:55 2-MAR-11
Hardware: B2 Software: 3.21
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"PSNS032"
SITE DESCRIPTION:
"PSNS032"

UNITS SELECTED:
LENGTH: ft

24, 1000 ml BTLS
23 ft SUCTION LINE
12 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 ml SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

STE #4 032 smpl rpt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I /01= NONE
I /02= NONE
I /03= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 2483481595 10:55 2-MAR-11
Hardware: B2 Software: 3.21
***** SAMPLING RESULTS *****
SITE: PSNS032
PROGRAM: PSNS032
Program Started at 13:30 SA 26-FEB-11
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE ERROR	COUNT TO LIQUID

		13:30	PGM DISABLED	

		TU 01-MAR-11		
		09:47	PGM ENABLED	
1,4	1	09:47	E	652
2,4	1	09:49	F	646
3,4	1	09:49	F	652
4,4	1	09:50	F	656
1,4	2	09:51	F	659
2,4	2	09:52	F	652
3,4	2	09:53	F	664

				STE #4 032 smpl rpt
4, 4	2	09: 54	F	656
1, 4	3	09: 55	F	684
2, 4	3	09: 56	F	654
3, 4	3	09: 57	F	658
4, 4	3	09: 58	F	670
1, 4	4	09: 59	F	654
2, 4	4	10: 00	F	664
3, 4	4	10: 01	F	670
4, 4	4	10: 02	F	660
1, 4	5	10: 03	F	659
2, 4	5	10: 04	F	652
3, 4	5	10: 05	F	658
4, 4	5	10: 06	F	658
1, 4	6	10: 07	F	660
2, 4	6	10: 08	F	654
3, 4	6	10: 09	F	658
4, 4	6	10: 10	F	664
1, 4	7	10: 11	F	658
2, 4	7	10: 12	F	664
3, 4	7	10: 13	F	658
4, 4	7	10: 14	F	658
1, 4	8	10: 15	F	659
2, 4	8	10: 16	F	662
3, 4	8	10: 17	F	658
4, 4	8	10: 18	F	664
1, 4	9	10: 19	F	659
2, 4	9	10: 20	F	671
3, 4	9	10: 21	F	662
4, 4	9	10: 22	F	659
1, 4	10	10: 29	F	675
2, 4	10	10: 49	F	658
3, 4	10	11: 11	F	652
4, 4	10	11: 34	F NM	*
1, 4	11	11: 56	F NL	*
2, 4	11	12: 19	F NL	*
3, 4	11	12: 41	F NM	*
4, 4	11	13: 04	F	648
1, 4	12	13: 26	F	632
2, 4	12	13: 49	F	632
3, 4	12	14: 11	F	626
4, 4	12	14: 34	F	626
1, 4	13	14: 56	F	626
2, 4	13	15: 19	F	632
3, 4	13	15: 41	F	636
4, 4	13	16: 04	F	636
1, 4	14	16: 26	F NM	*
2, 4	14	16: 49	F	646
3, 4	14	17: 11	F	648
4, 4	14	17: 34	F	638
1, 4	15	17: 56	F	644
2, 4	15	18: 19	F	644
3, 4	15	18: 41	F	638
4, 4	15	19: 04	F	645
1, 4	16	19: 26	F NM	*
2, 4	16	19: 49	F NL	*
3, 4	16	20: 11	F NL	*
4, 4	16	20: 34	F NL	*
1, 4	17	20: 56	F NL	*
2, 4	17	21: 19	F NL	*
3, 4	17	21: 41	F NL	*
4, 4	17	22: 04	F NL	*
1, 4	18	22: 26	F NL	*
2, 4	18	22: 49	F NL	*


```

STE #4 032 smpl rpt
3, 4    18    23: 11    F    NL    *
4, 4    18    23: 34    F    NL    *
1, 4    19    23: 56    F    NL    *
----- WE 02-MAR-11 -----
2, 4    19    00: 19    F    NL    *
3, 4    19    00: 41    F    NL    *
4, 4    19    01: 04    F    NL    *
1, 4    20    01: 26    F    NL    *
2, 4    20    01: 49    F           642
3, 4    20    02: 11    F           638
4, 4    20    02: 34    F           626
1, 4    21    02: 56    F           620
2, 4    21    03: 19    F           614
3, 4    21    03: 41    F           614
4, 4    21    04: 04    F           608
1, 4    22    04: 26    F           612
2, 4    22    04: 49    F           608
3, 4    22    05: 11    F           614
4, 4    22    05: 34    F           614
1, 4    23    05: 56    F           621
2, 4    23    06: 19    F           620
3, 4    23    06: 41    F           626
4, 4    23    07: 04    F           626
1, 4    24    07: 26    F           633
2, 4    24    07: 49    F           644
3, 4    24    08: 11    F           639
4, 4    24    08: 34    F    NM    *
08: 35    PGM DONE 02-MAR

```

```

SOURCE E ==> ENABLE
SOURCE F ==> FLOW
ERROR NL ==> NO LIQUID DETECTED!
ERROR NM ==> NO MORE LIQUID!
-----

```

```

SAMPLER ID# 2483481595 10:55 2-MAR-11
Hardware: B2 Software: 3.21
MODULE: NONE
Hardware: Software: 0.00
***** COMBINED RESULTS *****
SITE: PSNS032
PROGRAM: PSNS032
Program Started at 13:30 SA 26-FEB-11
Nominal Sample Volume = 240 ml

```

```

MODULE: NONE
-----

```

```

SAMPLER ID# 2483481595 10:55 2-MAR-11
Hardware: B2 Software: 3.21
***** COMBINED RESULTS *****
SITE: PSNS032
PROGRAM: PSNS032
Program Started at 13:30 SA 26-FEB-11
Nominal Sample Volume = 240 ml
FR-TEMP
SAMPLE BOTTLE TIME C

```

STE #4 032 smpl rpt

NO FR-TEMPERATURE

STE#4 096 smpl rpt

SAMPLER ID# 3293179316 11:28 2-MAR-11
Hardware: B2 Software: 3.26
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"PSNS096"
SITE DESCRIPTION:
"PSNS096"

UNITS SELECTED:
LENGTH: ft

24, 1000 ml BTLS
22 ft SUCTION LINE
18 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 ml SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

STE#4 096 smpl rpt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I /01= NONE
I /02= NONE
I /03= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 3293179316 11:28 2-MAR-11
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS096
PROGRAM: PSNS096
Program Started at 11:07 MO 28-FEB-11
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE ERROR	COUNT TO LIQUID

11:07			PGM DISABLED	

TU 01-MAR-11			PGM ENABLED	


1,4	1	17:56	E	668
2,4	1	18:10	F	671
3,4	1	18:25	F	678
4,4	1	18:40	F	684
1,4	2	18:55	F	696
2,4	2	19:10	F	702
3,4	2	19:25	F	709

STE#4 096 smpl rpt

4, 4	2	19: 40	F	709
1, 4	3	19: 55	F	709
2, 4	3	20: 10	F	709
3, 4	3	20: 25	F	707
4, 4	3	20: 40	F	714
1, 4	4	20: 55	F	708
2, 4	4	21: 10	F	708
3, 4	4	21: 25	F	714
4, 4	4	21: 40	F	709
1, 4	5	21: 55	F	709
2, 4	5	22: 10	F	716
3, 4	5	22: 25	F	714
4, 4	5	22: 40	F	714
1, 4	6	22: 55	F	713
2, 4	6	23: 10	F	716
3, 4	6	23: 25	F	713
4, 4	6	23: 40	F	709
1, 4	7	23: 55	F	698
----- WE 02-MAR-11 -----				
2, 4	7	00: 10	F	690
3, 4	7	00: 25	F	684
4, 4	7	00: 40	F	678
1, 4	8	00: 55	F	671
2, 4	8	01: 10	F	662
3, 4	8	01: 25	F	654
4, 4	8	01: 40	F	648
1, 4	9	01: 55	F	642
2, 4	9	02: 10	F	636
3, 4	9	02: 25	F	630
4, 4	9	02: 40	F	630
1, 4	10	02: 55	F	624
2, 4	10	03: 10	F	623
3, 4	10	03: 25	F	618
4, 4	10	03: 40	F	619
1, 4	11	03: 55	F	619
2, 4	11	04: 10	F	618
3, 4	11	04: 25	F	617
4, 4	11	04: 40	F	618
1, 4	12	04: 55	F	618
2, 4	12	05: 10	F	620
3, 4	12	05: 25	F	623
4, 4	12	05: 40	F	624
1, 4	13	05: 55	F	630
2, 4	13	06: 10	F	630
3, 4	13	06: 25	F	635
4, 4	13	06: 40	F	637
1, 4	14	06: 55	F	637
2, 4	14	07: 10	F	638
3, 4	14	07: 25	F	643
4, 4	14	07: 40	F	645
1, 4	15	07: 55	F	652
2, 4	15	08: 10	F	654
3, 4	15	08: 25	F	660
4, 4	15	08: 40	F	665
1, 4	16	08: 55	F	661
2, 4	16	09: 10	F	668
3, 4	16	09: 25	F	672
4, 4	16	09: 40	F	666
1, 4	17	09: 55	F	671
2, 4	17	10: 10	F	669
3, 4	17	10: 25	F	670
4, 4	17	10: 40	F	667
1, 3	18	10: 55	F	668


STE#4 096 smpl rpt
2, 3 18 11: 10 F 661
3, 3 18 11: 25 F 662
11: 27 MANUAL PAUSE
11: 27 PGM STOPPED 02-MAR

SOURCE E ==> ENABLE
SOURCE F ==> FLOW



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Seattle, WA



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FXUS66 KSEW 282339

AFDSEW

AREA FORECAST DISCUSSION**NATIONAL WEATHER SERVICE** SEATTLE WA338 PM **PST** MON FEB 28 2011

.SYNOPSIS...SHOWERS WILL CONTINUE ACROSS WESTERN WASHINGTON TONIGHT WITH MORE SNOW IN THE MOUNTAINS. A DEEP SURFACE LOW IS FORECAST TO MOVE NORTH THROUGH THE OFFSHORE WATERS TUESDAY NIGHT INTO WEDNESDAY. THIS SYSTEM COULD BRING HIGH WIND TO THE COAST WITH WINDY CONDITIONS IN THE INTERIOR. THE PATTERN WILL REMAIN UNSETTLED THROUGH THE END OF THE WEEK AS AN **UPPER LEVEL TROUGH** SHIFTS INLAND.

&&

.SHORT TERM...MODELS REMAIN ON TRACT THROUGH THE SHORT TERM PERIOD. HIGHLIGHTS INCLUDE ONGOING **HEAVY SNOW** IN THE MOUNTAINS PARTICULARLY THE CENTRAL CASCADES. THEN STRONG WINDS EXPECTED TUE NIGHT INTO WED AS A DEEP LOW TRACKS NORTH OFF THE WA COAST.

OVERNIGHT...MOIST UNSTABLE **SW FLOW** WILL RESULT IN OFF-AND-ON SHOWERS ACROSS THE REGION. **TEMPS** SHOULD REMAIN MILD OVERNIGHT WITH **SLY ONSHORE FLOW**...HOWEVER SNOW LEVELS ARE ONLY A FEW HUNDRED **FT MSL**. AS WE HAVE SEEN OVER THE PAST FEW NIGHTS AND MORNINGS...WE MAY SEE LIGHT SNOW SHOWERS AT TIMES. HOWEVER...SIGNIFICANT ACCUMULATIONS ARE NOT EXPECTED. THE EXCEPTION MIGHT BE THE **SW** INTERIOR WHERE A STEADY BAND OF **MOISTURE** DRAPES OVER THE REGION WITH LOWS CLOSE TO FREEZING. MAY SEE UP TO 1 INCH ALONG THE I-5 CORRIDOR IN LEWIS COUNTY.

THE WEST SLOPES OF THE CASCADES ARE GETTING HAMMERED WITH HEAVY SNOW...ESPECIALLY SOUTH OF STEVENS. MODELS SHOW **HEAVY SNOW** CONTINUING OVERNIGHT AND THROUGH TUE AND WILL EXTEND THE WINTER **STORM WARNING**. LIGHTER SNOW AMOUNTS EXPECTED IN THE NORTH CASCADES BUT MT BAKER COULD SEE UP TO 6 INCHES...WILL GO WITH A WINTER WEATHER **ADVISORY** THERE.

TUE INTO WED...BECOMING WINDY. A RELATIVE BREAK IN THE PATTERN ON TUE UNTIL A DEEP SURFACE LOW STARTS TO **TRACK** NORTH OFF THE **PAC NW** COAST. THIS SYSTEM WILL SEND A **WARM FRONT** INTO **W** WA TUE NIGHT...BRINGING MORE RAIN TO THE AREA. MODELS HAVE DONE A PRETTY GOOD JOB TRACKING THIS LOW...965-970 **MB** MOVING UP 130W AND REACHING 50N BY 18Z WED. STRONG WINDS ARE EXPECTED AS THIS SYSTEM PASSES OFFSHORE...MAINLY THE NORTH AND CENTRAL COAST. **HIGH WIND WATCH** ALREADY POSTED. THE INTERIOR WILL SEE WINDY CONDITIONS WED AFTERNOON AND EVENING AS THIS SYSTEM WHIPS A **COLD FRONT** INLAND.



SHOWERS WILL CONTINUE ON THU AS A **TROUGH** LIES OVERHEAD...WITH THE AXIS MOVING INLAND THU NIGHT. 33

.LONG TERM...THE WEATHER THROUGH THE LONG TERM PATTERN REMAINS ACTIVE AS A SERIES **UPPER LEVEL** DISTURBANCES ROLL THROUGH THE **PAC NW**. THE WETTEST SYSTEM MAY ARRIVE FRI NIGHT AS MODELS DRAG ANOTHER COLD **FRONT** THROUGH THE REGION. THE **FLOW** ALOFT IS NEARLY ZONAL THROUGH THE WEEKEND...AND ANOTHER SYSTEM MAY CLIP THE AREA **SAT** NIGHT OR SUN. BEYOND THEN...A COLD UPPER LOW MAY FORM OFFSHORE AND MOVE INLAND EARLY NEXT WEEK. IN GENERAL...KEPT **POPS** ABOVE **CLIMO** AND **TEMPS** BELOW **CLIMO** THROUGHOUT. 33

&&

.HYDROLOGY...HEAVY RAINFALL IS NOT ANTICIPATED ACROSS WESTERN WA OVER THE NEXT TEN DAYS. FLOODING IS NOT EXPECTED ON AREA RIVERS...INCLUDING THE GREEN RIVER.

&&

.AVIATION...STRONG SOUTHWEST **FLOW** WILL CONTINUE THROUGH TUESDAY. WSR-88D SHOWS SHOWER ACTIVITY BECOMING MORE WIDELY SCATTERED THIS AFTERNOON. THIS TREND WILL CONTINUE TONIGHT. NEXT FRONTAL SYSTEM DEVELOPING SOUTH OF THE AREA TONIGHT SPREADING OVER WESTERN WASHINGTON DURING THE DAY ON TUESDAY. RAIN BEGINNING OVER THE SOUTHWEST INTERIOR 12Z-15Z SPREADING SLOWLY NORTH REACHING KBLI AROUND 03Z WEDNESDAY. CEILINGS IN THE CENTRAL SOUND AROUND 2000-3000 FEET WITH CEILINGS ELSEWHERE GENERALLY IN THE 3500-5000 FOOT RANGE. CEILINGS WILL IMPROVE ACROSS THE AREA AS THE LOW LEVEL **ONSHORE FLOW** DECREASES AND THE SHOWER ACTIVITY COMES TO AN END. **VFR** CEILINGS EXPECTED TUESDAY INTO TUESDAY EVENING WITH THE SURFACE GRADIENTS REMAINING EASTERLY IN RESPONSE TO A DEEP LOW DEVELOPING OFF THE NORTHERN CALIFORNIA/SOUTHERN OREGON COAST.

KSEA...CEILINGS IN THE 2000-3000 FOOT RANGE IMPROVING INTO THE 4000-5000 FOOT RANGE DURING THE EVENING HOURS. STILL A CHANCE OF A SHOWERS WITH THE **PRECIPITATION** TYPE RAIN OR RAIN AND SNOW MIXED. NO ACCUMULATIONS EXPECTED OVERNIGHT. SOUTH WIND 10-15 **KT** EASING A LITTLE BY 06Z. WINDS BECOMING EASTERLY LESS THAN 10 KNOTS ON TUESDAY. FELTON

&&

.MARINE...ONSHORE GRADIENTS WILL TURN WEAKLY OFFSHORE TONIGHT AND TUESDAY AS A 996 **MB** LOW JUST NORTHWEST OF THE NORTH END OF VANCOUVER ISLAND DRIFTS SOUTH AND GRADUALLY WEAKENS.

A VIGOROUS FRONTAL SYSTEM WILL AFFECT WESTERN WASHINGTON TUESDAY NIGHT AND WEDNESDAY ASSOCIATED WITH A SUB 970 **MB** LOW MOVING NORTH IN THE VICINITY OF 130W. CURRENT TIMING PUTS THE LOW WEST OF **CAPE** DISAPPOINTMENT AT 06Z WEDNESDAY AND WEST OF **CAPE** FLATTERY AT 12Z WEDNESDAY. THE LOW WILL CONTINUE TO **TRACK** NORTH DURING THE DAY ON WEDNESDAY. **GALE** FORCE WINDS FOR ALL OF THE WATERS EXCEPT FOR THE CENTRAL STRAIT OF JUAN DE FUCA LOOK LIKELY AND A **GALE WATCH** IS UP AT THIS TIME. THE WINDS WILL BEGIN OVER THE **COASTAL WATERS** TUESDAY NIGHT WITH THE STRONGEST WINDS OVER THE INTERIOR WATERS DURING THE LATTER HALF OF WEDNESDAY.

IN ADDITION...HAZARDOUS **SEAS** WILL DEVELOP WITH SOUTHWEST SWELLS BUILDING TO 15-18 **FT**.

ANOTHER VIGOROUS PACIFIC FRONTAL SYSTEM MAY IMPACT THE REGION FRIDAY AND FRIDAY NIGHT. FELTON

&&

.SEW WATCHES/WARNINGS/ADVISORIES...

WA...**WINTER STORM WARNING** CENTRAL CASCADES THROUGH TUE AFTERNOON.

WINTER WEATHER ADVISORY NORTH CASCADES THROUGH TUE AFTERNOON.

HIGH WIND WATCH COAST TUE NIGHT THROUGH WED AFTERNOON.

PZ...**SMALL CRAFT ADVISORY** COAST...WEST ENTRANCE AND PUGET SOUND AND
HOOD CANAL.

GALE WATCH ALL WATERS EXCEPT CENTRAL STRAIT.

SMALL CRAFT ADVISORY GRAYS HARBOR BAR FOR ROUGH BAR CONDITIONS.

\$\$

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National Oceanic and Atmospheric Administration
National Weather Service
Seattle Weather Forecast Office
7600 Sandpoint Way NE
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Your National Weather Service forecast

Bremerton WA


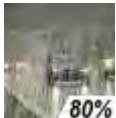
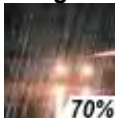
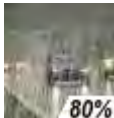

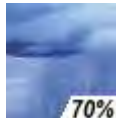

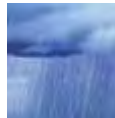
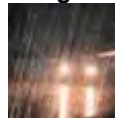


Enter Your "City, ST" or zip code

NWS Seattle, WA
Point Forecast: Bremerton WA
 47.56°N 122.62°W (Elev. 0 ft)

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Last Update: 3:42 pm PST Feb 28, 2011
Forecast Valid: 7pm PST Feb 28, 2011-6pm PST Mar 7, 2011

Forecast at a Glance

Tonight	Tuesday	Tuesday Night	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday	Friday Night
								
70%	80%	70%	80%	70%	70%	70%		
Showers Likely	Rain	Rain Likely	Rain	Showers Likely	Showers Likely	Showers Likely	Chance Showers	Rain
Lo 36 °F	Hi 43 °F	Lo 38 °F	Hi 47 °F	Lo 37 °F	Hi 45 °F	Lo 37 °F	Hi 46 °F	Lo 40 °F

Detailed 7-day Forecast

Tonight: Showers likely. Cloudy, with a low around 36. South wind between 8 and 10 mph. Chance of precipitation is 70%.

Tuesday: Rain. High near 43. South wind around 6 mph becoming east. Chance of precipitation is 80%.

Tuesday Night: Rain likely. Cloudy, with a low around 38. Calm wind becoming southeast around 6 mph. Chance of precipitation is 70%.

Wednesday: Rain. High near 47. South wind between 8 and 18 mph. Chance of precipitation is 80%.

Wednesday Night: Showers likely. Cloudy, with a low around 37. South southwest wind 17 to 20 mph decreasing to between 8 and 11 mph. Chance of precipitation is 70%.

Thursday: Showers likely. Mostly cloudy, with a high near 45. Chance of precipitation is 70%.

Thursday Night: Showers likely. Cloudy, with a low around 37. Chance of precipitation is 70%.

Friday: A chance of showers. Cloudy, with a high near 46.

Friday Night: Rain. Mostly cloudy, with a low around 40.

Saturday: Showers likely. Mostly cloudy, with a high near 46.

Saturday Night: A chance of showers. Mostly cloudy, with a low around 38.


Sunday: A chance of showers. Mostly cloudy, with a high near 45.

Sunday Night: A chance of showers. Mostly cloudy, with a low around 38.



Monday: A chance of showers. Mostly cloudy, with a high near 44.

Detailed Point Forecast [Move Down]

Click Map for Forecast [Disclaimer](#)



+ Requested Location ■ Forecast Area
Lat/Lon: 47.56°N 122.62°W **Elevation:** 0 ft

Current Conditions [Move Up]

Bremerton, Bremerton National Airport
 Last Update on 28 Feb 15:35 PST

Overcast

37°F
(3°C)

Humidity: 81 %

Wind Speed: SSE 10 G 18 MPH

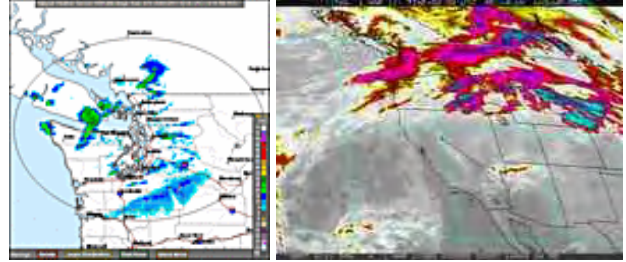
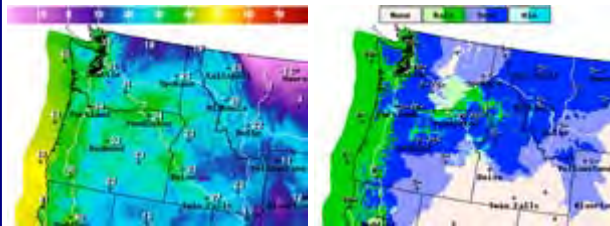
Barometer: 29.78 in (N/A mb)

Dewpoint: 32°F (0°C)

Wind Chill: 30°F (-1°C)

Visibility: 10.00 Miles

More Local Wx: [3 Day History](#)

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Point Forecast: Bremerton WA
47.56N 122.62W (Elev. 0 ft)

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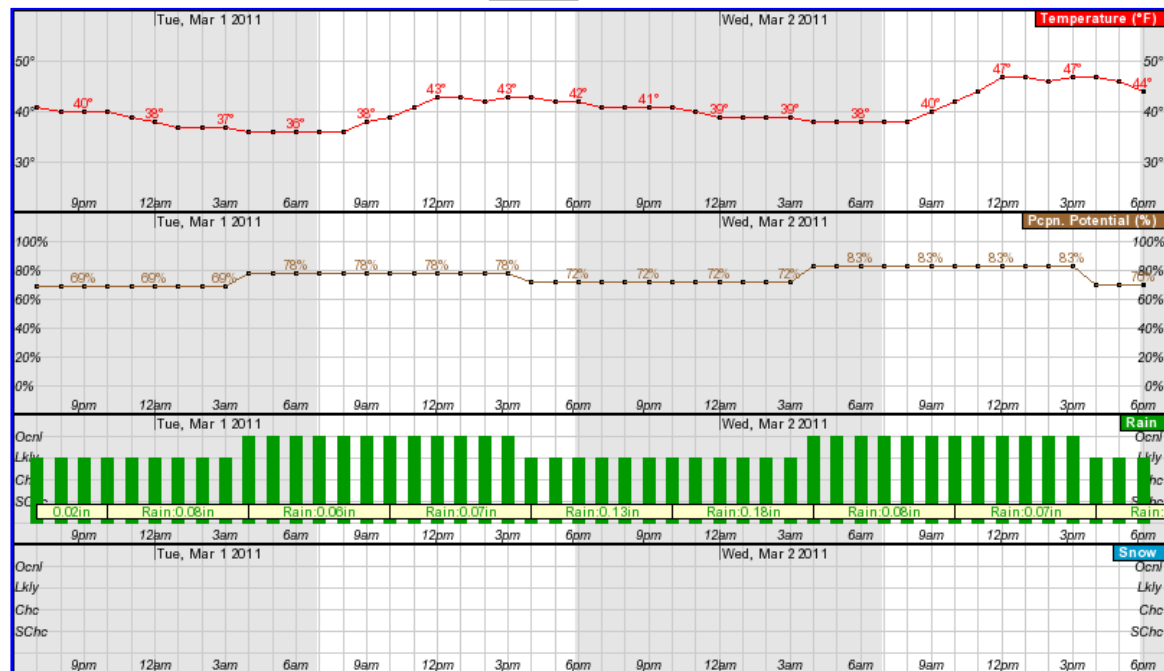
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Hourly Weather Forecast Graph

[\[dashes/dots\]](#) [\[b/w\]](#) [\[hide menu\]](#)

Weather Elements		Weather/Precipitation
<input checked="" type="checkbox"/> Temperature (°F)	<input type="checkbox"/> Surface Wind <input type="text" value="mph"/>	<input type="checkbox"/> Thunder
<input type="checkbox"/> Dewpoint (°F)	<input type="checkbox"/> Sky Coverage	<input checked="" type="checkbox"/> Rain
<input type="checkbox"/> Wind Chill (°F)	<input checked="" type="checkbox"/> Precipitation Potential	<input checked="" type="checkbox"/> Snow
	<input type="checkbox"/> Relative Humidity	<input type="checkbox"/> Freezing Rain
		<input type="checkbox"/> Sleet

48-Hour Period Starting:



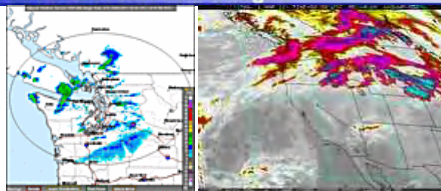
Monday, February 28 at 7pm

Temperature: 41 °F

Precipitation Potential: 69%

Rain: Likely (60%-70%) Snow: <10%

Radar and Satellite Images



Additional Forecasts & Information

[International System of Units](#) [Forecast Discussion](#)
[7-Day Forecast](#) [Tabular Forecast](#)
[Quick Forecast](#)

[Webmaster](#)
[NOAA's National Weather Service](#)
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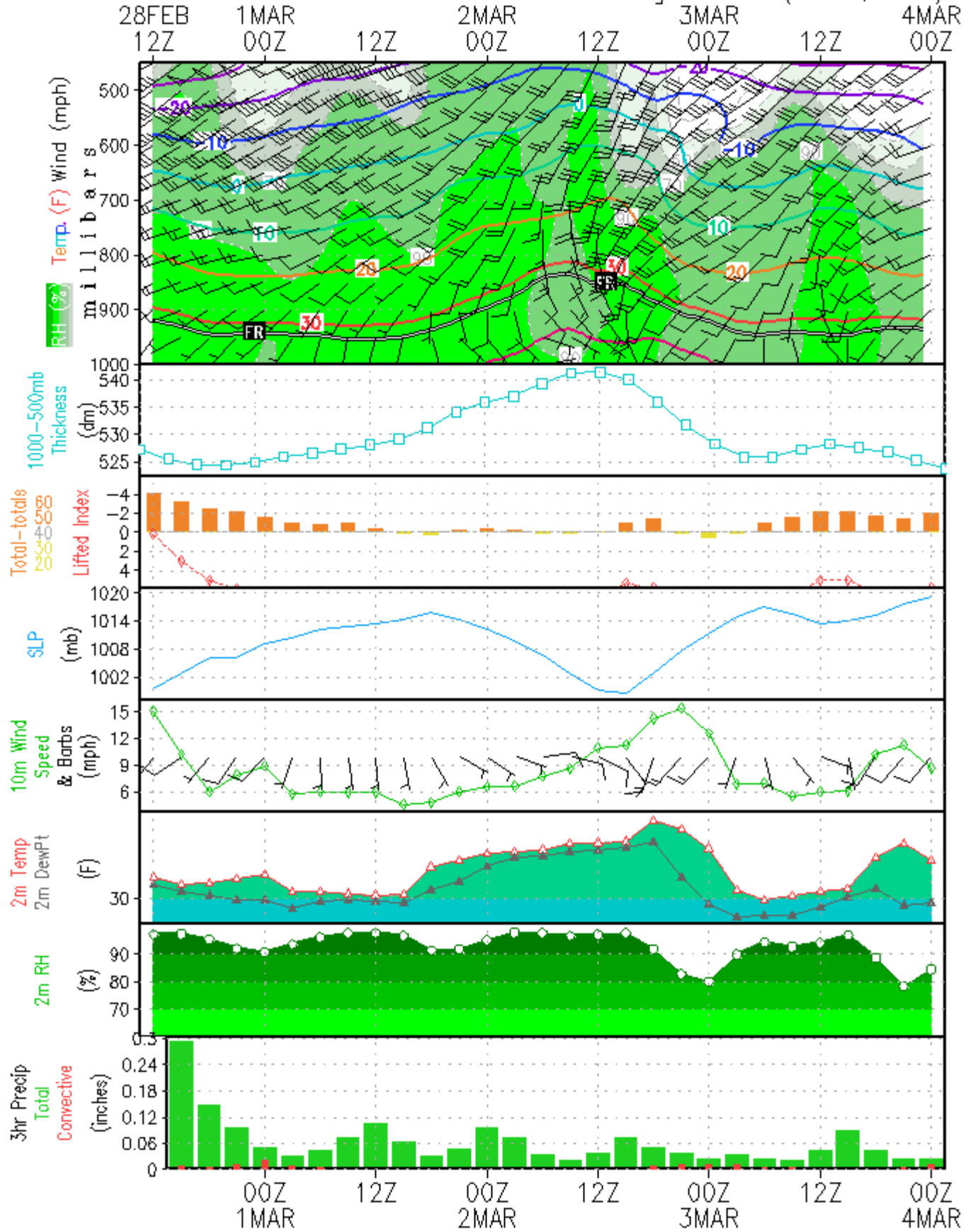
Forecast For Lat/Lon: 47.5570/-122.6540 (Elev. 0 ft)
Bremerton WA

Custom Weather Forecast Table

	Mon Feb 28				Tue Mar 01				Wed Mar 02				Thu Mar 03				Fri Mar 04				Sat Mar 05				Sun Mar 06			
Weather	Rain	Rain Showers	Likely Rain Showers		Rain	Likely Rain			Rain		Likely Rain Showers					Chance Rain Showers	Rain		Likely Rain Showers		Chance Rain Showers							
Daily-Temp		High 44 Low 36			High 42 Low 36				High 45 Low 38				High 45 Low 37				High 45 Low 37				High 47 Low 39				High 46 Low 38			
Chance of Precip	80%	80%	70%·70%		80%·80%·70%·70%				85%·85%·70%·70%				75%·75%·70%·70%				50%·50%·75%·75%				70%·70%·55%·55%				50%·50%·50%·50%			
Precip	0.04"	0.02"	0.03"·0.08"		0.07"·0.08"·0.14"·0.18"				0.08"·0.06"·0.04"·0.07"				0.02"·0.02"·0.02"·0.02"				0.01"·0.01"·0.24"·0.13"				0.04"·0.04"·0.02"·0.02"				0.04"·0.05"·0.07"·0.01"			
12-hr Snow Total		0"	0"		0"	0"			0"	0"			0"	0"			0"	0"			0"	0"			0"	0"		
6-Hour Temp	4am·10am	4pm·10pm	4am·10am·4pm·10pm		4am·10am·4pm·10pm				4am·10am·4pm·10pm				4am·10am·4pm·10pm				4am·10am·4pm·10pm				4am·10am·4pm·10pm				4am·10am·4pm·10pm			
Cloudiness	93%·87%	91%·91%	87%·91%·96%·98%		97%·97%·89%·89%				86%·86%·90%·90%				95%·95%·84%·84%				85%·85%·85%·85%				80%·80%·80%·80%				80%·80%·80%·80%			
Dewpoint	34·35	38·36	33·33·36·35		34·36·40·37				34·34·38·37				33·33·38·39				36·36·41·40				35·34·39·38							
Relative Humidity	92%·82%	79%·91%	87%·78%·79%·84%		83%·80%·83%·91%				86%·75%·79%·91%				85%·74%·78%·91%				86%·76%·81%·95%				88%·74%·77%·88%							
Wind	S·S	SW·S	S·SE·SE·N		SE·SW·S·S				S·S·SE·S				S·S·E·SE·NE				S·S·SE·S				SE·SE·W·W							
	17·16	9·9	8·5·7·1		8·20·21·8				5·7·14·10				10·5·9·2				16·10·5·7				6·5·5·5							
Snow Level (ft)	378·492	854·512	512·830·1585·3634		3549·2023·1187·742				765·569·814·862				417·1184·2785·2545				2563·1925·1844·1844				1668·1668·1336·1336							

Seattle

NAM 0-84hr Forecast Meteogram for (122W, 47N)





STORM EVENT REPORTS #5/6
For
Non-Dry Dock Stormwater Monitoring
Conducted at
Puget Sound Naval Shipyard
Bremerton, WA
Project ENVVEST Study Area

March 8 and 9, 2011



Puget Sound Naval Shipyard and Surrounding Area

PNNL Contract No.: N4523A10MP00034 Amendment 1



1.0 Introduction

Taylor/TEC conducted non-dry dock stormwater sampling tasks within the Puget Sound Naval Shipyard (PSNS) – Project ENVVEST study area between March 7th and March 10th, 2011. During this period the fifth and sixth storm event (STE) sampling efforts of the 2010-2011 project field season were conducted. The Navy refers to these efforts as Stormwater (SW) (sampling) events; consequently both the “STE” and “SW” nomenclature are used throughout this report. A summary of these events and conditions that occurred during STE#5-6 (SW05 and SW06) are presented in this report, with supporting information as attachments.

This STE Report contains: 1) a list of the Taylor/TEC and Navy staff that participated in the event and their base roles; 2) details regarding storm event preparatory tasks; 3) weather forecast information and targeting details; 4) a precipitation and event qualification summary; 5) a sampling information, management and validation discussion; 6) basin runoff calculations; 7) descriptive statistics and discussion of the event station monitoring data; 8) notable anomalies and variations to the PWP; and 9) action items.

Attachments to this report include: Storm and Sample Information and Validation Checklist (spreadsheet), Stormwater Field Sampling Forms and Storm Controller Notes, Chain of Custody forms, basin runoff calculation worksheet, monitoring station hydrographs, autosampler operational reports and weather forecast information.

Event Summary: Basic STE details are provided below as a “*Quick Reference*”:

- Event/s conducted: SW05 and SW06
- Event Date/s: SW05 = 3/8/2011 and SW06 = 3/9/2011
- Current Monitoring Stations: NBK stations; PSNS008, PSNS015 and PSNS032 and CIA station PSNS096
- Antecedent Conditions Met ?: SW05 = Yes, SW06 = Conditionally
- STE Rainfall Total (as measured at the PSNS B427 gauge): SW05 (0.19”), with stations ranging from 0.17” to 0.19” and; SW06 (2.60), with stations ranging from 2.05” to 2.39”
- Sampling Period Rainfall Total: station range = SW05 0.08” to 0.15”; SW06 1.56” to 1.78”
- Monitoring Stations Sampled: SW05 = PSNS008, PSNS015 and PSNS032; SW06 = PSNS032 and PSNS096
- Samples Collected: SW05 and SW06 = both grab and composites at stations listed above
- Quality Control (QC) Samples Collected: SW05 = grab duplicate @ PSNS032 and composite duplicate @ PSNS008; SW06 = no QC samples collected
- Based on consideration of storm event and sample validation information, were the samples collected during SW05 and SW06 valid for project purposes? (Y / N, composite, grab or both): All samples collected during both of these events were valid.

2.0 Project Staff Participating in the STE

Taylor/TEC:

Dave Metallo – Project Manager (Taylor/TEC), Storm Controller, Field Event and QC Manager

Brian Rupert – Field Team Leader

Navy Personnel:

Bruce Beckwith – Project Manager, Navy Field Team Lead

Bob Johnston – Project Oversight, Senior Technical Lead

Jacquelyn Young – NPDES Program Manager/ Oversight, Navy Field Team Leader

Eric Mollerstuen – Field Team Member

3.0 Storm Event Preparatory Tasks

Based on continued QC-assessments of the telemetered vault data (level, temperature, conductivity and salinity) from PSNS096, with its re-designed sensor configuration, it was noted that all parameters were being collected without incident and within expected ranges. Data assessments from the NBK stations also revealed that parameter collections were within acceptable ranges as well.

On Monday March 7th all four of the current stormwater monitoring stations (PSNS 008, PSNS015, PSNS032 and PSNS096) were reset (after completion of STE#4) and readied for stormwater sample collection. All of the stations were deemed to be functioning properly, operational and “sample ready” at this point (see Sections 1 and 2 of the attached *Stormwater Field Sampling Forms*). Figure 1 shows the general location of the monitoring stations at the PSNS (both CIA and NBK locations).

All stations were programmed with pre-determined autosampler enable and pacing conditions set “high” to prevent premature enabling (*sample disable mode*), as directed by the Taylor/TEC Storm Controller. Station operations were passed to the Taylor /TEC Storm Controller to be managed via telemetry. Note: the conductivity repeatable enable function utilized during STE#4 at PSNS096 was not used at this or any other station during STE#5-6.

4.0 Weather Forecast Information and STE Targeting Details

Taylor/TEC began targeting potential back-to-back storm events forecasted for March 8th and 9th several days prior to conducting the station resets on March 7th. The forecast for the 9th and 10th of March appeared to be predict a rather large event of greater than 1.5” of potential rainfall. However, there was a smaller event forecast for March 8th of approximately 0.2” of rainfall. The March 8th storm had the potential to be a separate qualifying event. If the March 8th storm did qualify as a separate event it would have likely produced too great of a rainfall amount prior to the

larger event forecasted for the 9th to not be considered in terms of the project defined antecedent dry period (≤ 0.1 " in 24-hrs and 0" in 6-hrs OR application of the 24-hr 10% overage conditional element). The March 8th event had the potential to exceed the conditional element of antecedent overage being greater than 10% of the overall storm event volume and was therefore tracked and treated as a separate event. The Project Team thinking was that we needed to be ready to sample the March 8th event and then be immediately ready to sample the following larger storm on March 9th. We were also prepared for the other potential scenarios as well, these being; 1) the March 8th storm was larger than forecast and lasts into the 9th and becomes one large event, 2) the March 8th storm is sampled but turns out to be a non-qualifying event (false start), or 3) the March 8th storm is sampled, but a non-qualifying antecedent dry period persists before the start of the larger rain event – in that case at least the March 8th event would have been captured/sampled and the Navy would have had the option to retain any collected data from the subsequent larger storm event.

Since the completion of STE#4, which was conducted on March 1st and 2nd, there had been two small storm events pass over the project area at PSNS. These two storms had a combined total of approximately 0.5" of rainfall as recorded by the Navy's gauge atop B427.

On March 7th the National Weather System (NWS)'s (<http://www.wrh.noaa.gov/sew/>) forecast for the Bremerton/PSNS area called for an *"abrupt change to a wet and occasionally windy weather pattern"* as an occluded warm front moves inland and across the region (with another frontal system following quickly behind) bringing rain by early morning. The next system forecast for March 9th was set to be stronger (wetter) and regionally broader. Based on the NWS discussions and associated forecast elements, both of these approaching storms were deemed to be potentially qualifying project events.

The routinely referenced weather models used to gain forecast information regarding the Pacific Northwest, the MM5-NAM (<http://www.atmos.washington.edu/mm5rt/rt/naminit.12km.html>) and the GFS-WRF (<http://www.atmos.washington.edu/mm5rt/rt/gfsinit.frame1.html>) (both hosted by the University of WA and initialized for the PNW) were in agreement with each other for the March 8th forecast, but slightly divergent for the 9th. However, both models showed consistency in their predication of rain and windy conditions developing over the project area with the approaching warm fronts and low pressure systems.

The forecasted precipitation probability for March 8th was 87% for approximately 0.18" rainfall depth or greater event. The forecasted precipitation probability for March 9th into the 10th was 90-100% for approximately 1.6" rainfall depth or greater event. The NWS forecast called for rain over the project area by Tuesday morning, with showers tapering off by late afternoon. Further the forecast indicated a dry period between the two events, with rain beginning again during the early morning of the 9th. Detailed weather information is provided as an attachment to this report.

Once the field crew reported the completion of their site preparatory tasks on March 7th the Taylor/TEC Storm Controller took control of station operations via telemetry. Station status was checked at various times during the late afternoon and evening of March 7th. All of the stations had already reached their 24-hr and 6-hour no rain antecedent condition prior to conducting station resets.

The enable condition switches at each monitoring station were turned on and appropriately set for condition enabling (*sample ready mode*). Table 1A lists the monitoring station enabling conditions that were used for STE#5.

By the morning (~0700) of March 8th a check of the stations revealed that there was rainfall across the Shipyard. By 0700 nearly all of the forecasted 0.2" of rainfall had already been recorded and the storm was nearly finished. The NBK stations had enabled between approximately 0411 (PSNS008) and 0455 (PSNS015), with rain amounts between 0.16" (PSNS032) and 0.19" (PSNS008). The conductivity condition at PSNS096 remained too high for enabling – however the station remained armed.

A review of each station's vault hydrograph (see attached) during STE#5 showed that water level stage was elevated above base flow conditions and conductivity values were below the disable threshold ($\leq 2000 \mu\text{S}/\text{cm}$) at the initiation of composite sampling (composite sample enable). By 1300, after discussions with the Navy, the decision was made to stop the samplers via telemetry and to get ready for the next incoming storm event. *Storm Controller Notes*, which provide additional details, are attached to this report.

Table 1A. Monitoring Station Enabling Conditions for STE#5

Station	Rainfall (in/hr)	Level (ft)	Conductivity ($\mu\text{S}/\text{cm}$)	Repeatable Conductivity Enable (Y/N)	Pacing Rate (min)	¹ Antecedent Period (24hr/6hr)
PSNS008	0.03	0.3	2000	N	15	0.0" / 0"
PSNS015	0.03	0.3	2000	N	15	0.0" / 0"
PSNS032	0.03	0.3	2000	N	15	0.0" / 0"
PSNS096	0.03	0.3	2000	N	15	0.0" / 0"

¹Antecedent condition as checked on morning and evening of 3/7/11

After completion of sampling for STE#5 at the NBK stations the samplers were reset via telemetry. Since the NBK stations had only used 9 bottles, there were 15 remaining at PSNS032 and PSNS015. PSNS008 had been setup for duplicate collection and could not be re-programmed – so this station was not considered for STE#6. A check of the sampler units was conducted and remaining battery power supply was assessed. It was determined that PSNS015 and PSNS032 were capable and ready for collection of samples during the next rain event. PSNS096 had not enabled during STE#5 and therefore remained ready for the next rain event with a full complement of 24-bottles.

Once again the enable condition switches at each monitoring station were turned on and appropriately set for condition enabling (*sample ready mode*). Table 1B lists the monitoring station enabling conditions that were used for STE#6.

By ~0700 on the morning of the 9th a check of the stations revealed that there had been in excess of 0.3" of rainfall across the Shipyard as it continued to rain steadily. The STE#6 monitoring stations had enabled between approximately 0229 (PSNS096) and 0517 (PSNS032), with rain amounts of 0.13" and 0.30", respectively, at the time each enabled. The initial pacing rate frequency at 032 was set for 15 minutes/aliquot. The pacing rate frequency was increased to 30 minutes/aliquot after 6 complete bottles to lengthen the available sampling duration at this location. PSNS015 did not properly enable, nor collect samples. See section 9 for details.

A review of each station's vault hydrograph (see attached) during STE#6 showed that water level stage was elevated above base flow conditions and conductivity values were below the disable threshold ($\leq 2000 \mu\text{S}/\text{cm}$) at the initiation of composite sampling (composite sample enable). The STE#6 stations each sampled for approximately 24-hours in duration. The attached *Storm Controller's Notes* provide additional information regarding station.

Table 1B. Monitoring Station Enabling Conditions for STE#6

Station	Rainfall (in/hr)	Level (ft)	Conductivity ($\mu\text{S}/\text{cm}$)	Repeatable Conductivity Enable (Y/N)	Pacing Rate (min)	¹ Antecedent Period (24hr/6hr)
PSNS015	0.03	0.3	2000	N	15	² 0.17" / 0"
PSNS032	0.03	0.3	2000	N	15 / 30 ³	² 0.17" / 0"
PSNS096	0.03	0.3	2000	N	15	² 0.16" / 0"

¹Antecedent condition as of initiation of composite sample collection on 3/9/11

²24hr antecedent dry period condition (≤ 0.1 ") was not met; however, the overage amount was less than 10% of the overall storm event rainfall as measured at that station.

³Pacing rate frequency was initially set at 15 minutes, increased to 30 minutes.

5.0 Precipitation and STE Qualification Summary

Precipitation Summary:

The previous rain event to cause runoff (≥ 0.03 " rainfall without 6-hr gap) prior to the onset of STE#5 was approximately 3-days:5-hours as measured by each stations rain gauge. Rain began to fall over the project site, as forecast, around 0330 on March 8th. Light to moderate rain fell steadily from the onset of the STE for about 3.5 hours. Rain intensities ranged from 0.057 in/hr at PSNS008 and PSNS015 to 0.040 in/hr at PSNS032. The rainfall totals ranged from 0.19" at PSNS008 to 0.17" at both PSNS015 and PSNS032. The rainfall occurred in one continuous event and ended abruptly around 0700 on March 8th. The Navy's rain gauge at B427 recorded a very similar rainfall signature with 0.19" of rain depth over a similar period.

Sampling duration ranged from 6:45 (hrs:min) at PSNS015 to 4:30 at PSNS032. Sampling did not occur at PSNS096 due to conductivity values above the 2000 $\mu\text{S}/\text{cm}$ project threshold that persisted during the entire duration of STE#5.

Table 2A summarizes the rainfall amounts that occurred during the sampling period for each monitoring station as well as the PSNS rain gauge at B427 and the overall storm event depths measured at each station. Table A-1A (*Storm Qualification and Sample Validation Information Checklist*), attached to this report, provides additional storm event and sampling period rainfall information.

Table 2A. Rainfall Totals for PSNS Gauge and Monitoring Stations During STE#5

Station	Total Storm Event Rainfall (in)	Sampling Period	Sampling Period Rainfall (in)	% Rainfall During Sampling Period vs. STE Period
B427	0.19	NA	NA	NA
PSNS008	0.19	3/8 0412 to 0856	0.15	79%
PSNS015	0.17	3/8 0456 to 1140	0.08	47%
PSNS032	0.17	3/8 0435 to 0904	0.12	71%
PSNS096	0.16	NA	NA	NA

The previous rain event to cause runoff (≥ 0.03 " rainfall without 6-hr gap) prior to the onset of STE#6 was approximately 17-hours as measured by each stations rain gauge. Rain began to fall over the project site, as forecast, in moderate intensity, just after midnight on March 9th. Moderate to moderately heavy rain fell steadily from the onset of the STE for about 5 hours before briefly lightning up until around 0700. Rain intensity increased again around 0730 and remained moderate to heavy with some of the most intense rainfall of the storm event around 1130. The rainfall again tailed off between 1230 and 1330 at all of the stations. Rainfall totals for the stations to this point ranged from 1.07" at PSNS096 to 0.90" at PSNS032. There was intra-event dry period at the monitoring stations that lasted until about 2045 when rain again intensified. Rainfall remained moderately heavy until 0430 on March 10th. Rainfall tailed off and the intensity was noted to be lite to moderately lite until the storm finally ended between 1545 (PSNS032 and 096) and 1650 (PSNS015). The Navy's rain gauge at B427 recorded a very similar rainfall signature for both portions of the storm event.

Sampling duration was approximately 24-hours for both PSNS032 and PSNS096. As mentioned above PSNS015 encountered problems with its enable settings and therefore did not collect samples.

Table 2B summarizes the rainfall amounts that occurred during the sampling periods for each monitoring station as well as the PSNS rain gauge at B427 and the overall storm event depths measured at each station. Table A-1B (*Storm Qualification and Sample Validation Information*

Checklist), attached to this report, provides additional storm event and sampling period rainfall information.

Table 2B. Rainfall Totals for PSNS Gauge and Monitoring Stations During STE#6

Station	¹ Rainfall During First Half of STE (in)	² Rainfall During Second Half of STE (in)	Sampling Period	Sampling Period Rainfall (in)	% Rainfall During Sampling Period vs. STE Period	Total Storm Event Rainfall (in)
B427	1.14	1.46	NA	NA	NA	2.60
PSNS015	1.00	1.21	NA	NA	NA	2.21
PSNS032	0.90	1.15	1.56	3/9/11 0517 to 3/10/11 0514	76%	2.05
PSNS096	1.07	1.32	1.78	3/9/11 0229 to 3/10/11 0213	74%	2.39

¹As defined above as the period from approximately 0000 to 1330 on 3/9/11.

²As defined above as the period from approximately 2045 on 3/9/11 to 1650 on 3/10/11.

STE Qualification Summary:

All storm qualification conditions were met for both STE#5 and STE#6. Storm event qualification conditions included wet season event date range (Oct 1 – May 1), forecast probability ($\geq 70\%$), forecasted storm depth (≥ 0.1 "), storm duration (≥ 2 hrs) and runoff occurrence / hydrograph stage (elevated above base flow). Antecedent dry period (≤ 0.1 " rain in previous 24hrs and 0" rain in previous 6hrs) qualification for STE#5 meet the typical project standard and STE#6 was conditionally met as described above. Tables A-1A and A-1B (*Storm Qualification and Sample Validation Information Checklist*), attached, document the particular STE qualification parameters listed above.

6.0 Sampling Information, Management and Validation

Grab Sampling:

Grab sample collection for both STE#5 and #6 was performed by the Navy Team, with storm control assistance (limited to station status checks via telemetry) from Taylor/TEC as necessary. Grab sampling was conducted at monitoring stations PSNS008, PSNS015 and PSNS032 during STE#5 and at PSNS032 and PSNS096 during STE#6. Grab samples were not collected for PSNS096 during STE#5 because the station had not enabled due to high conductivity conditions. Grab samples were not collected at PSNS015 during STE#6 because sampling had not commenced due to an enable setting issue (see Section 9). Sampling methodology followed the guidance as per the 2010-11 Project Work Plan (PWP). Water quality condition (conductivity and

temperature) was assessed prior to the collection of the samples. Samples were collected only if conductivity was determined to be $\leq 2000 \mu\text{S}/\text{cm}$. Samples were collected using manual methods; a laboratory cleaned stainless steel dip cup, lowered on an extension pole into a stormwater vault, used to fill the appropriate analytical containers. Parameters included total petroleum hydrocarbons (NW-TPH-Dx) and fecal coliform. Samples for STE#5 were collected on March 8th between 0830 (PSNS008) and 0934 (PSNS015). Samples for STE#6 were collected on March 9th between 1310 (PSNS032) and 1340 (PSNS096). Sample collection was coordinated with low or lower tidal conditions to ensure that proper conductivity conditions would exist. Grab sampling times are indicated on the attached hydrographs to illustrate the water level stage during collection. Grab sample IDs and other pertinent information is listed in the *Stormwater Field Sampling Forms* and in Tables A-1A and A-1B (all are attached). Tables 3A and 3B summarize these results.

Table 3A. Grab Sampling Details for STE#5

Sample Collection Criteria:	PSNS008	PSNS015	PSNS032
Grab sample ID	SW05-0001	SW05-0002	SW05-0003
Grab Date /Time	3/8/2011 8:30	3/8/2011 9:34	3/8/2011 8:50
Grab sample conductivity value ($\mu\text{S}/\text{cm}$)	55	68	175
Hydrograph stage at grab collection	Falling limb	Falling limb	Falling limb
Grab parameters collected per PSNS PWP?	Yes	Yes	Yes

Table 3B. Grab Sampling Details for STE#6

Sample Collection Criteria:	PSNS096	PSNS032
Grab sample ID	SW06-0001	SW06-0009
Grab Date /Time	3/9/2011 13:10	3/9/2011 13:40
Grab sample conductivity value ($\mu\text{S}/\text{cm}$)	123	219
Hydrograph stage at grab collection	Intra-event runoff	Intra-event runoff
Grab parameters collected per PSNS PWP?	Yes	Yes

Composite Sampling:

Composite sample retrieval tasks and formulation procedures were managed and performed by Taylor/TEC with support from PNNL/MSL personnel. Composite samples were for STE#5 and STE#6 at the same stations as noted above in the Grab Collection section.

All composite samples were collected via autosamplers which were operated and synchronized by a custom designed telemetered water quality control system. Composite sample collection for STE#5 ranged from March 8st (0411) at PSNS008 to (0934) at PSNS015 on the same day. Composite sample collection for STE#6 ranged from March 9st (0229) at PSNS096 to (0513) at PSNS032 on March 10th.

Methods used in preparation, autosampler collection, retrieval and formulation of the composite samples were conducted as per the 2010-11 PWP. Discrete time-paced samples were collected in 1000-ml plastic wedge bottles (up to 24 bottles available in each autosampler base) at a rate of 240-ml / 15 minutes (four samples/bottle, one bottle/hour) per aliquot; which, at this pacing, provides for up to 24 hours of sampling period coverage. Time pacing for PSNS032 during STE#6 was adjusted to 240-ml / 30 minutes after six bottles paced at 15 minutes/sample to allow for greater sample collection duration (with a compliment of 15 bottles). Samplers at each station were enabled as per the conditions stated in Section 4 of this report. Each station was outfitted with either a pressure transducer (level and temperature) / conductivity (with salinity post-calculated) probe combo (INW CT2X) (PSNS008, PSNS015 and PSNS032) or a pressure transducer (level and temperature) (Campbell CS450) and a separate multi-parameter sonde (conductivity, salinity and temperature) (YSI6820) (PSNS096).

The discrete samples from each station (contained in the autosampler bases) were brought back the C106 Stormwater Lab at B147 for processing. Composite formulation for STE#5 occurred on March 9th between 1215 and 1345. Composite formulation for STE#6 occurred on March 10th between 0750 and 0950. Each individual discrete sample from each monitoring station was screened with bench-top meters for their conductivity (YSI 556) and turbidity (Hach 2100P) values. Bottles with conductivity values of ≤ 2000 $\mu\text{S}/\text{cm}$ were considered for inclusion in the overall composite sample; bottles testing greater than 2000 $\mu\text{S}/\text{cm}$ were discarded. Composite formulation followed the procedures as detailed in Section 8.2.5 of the 2010-11 PWP. Based on this screening criterion various bottles from each station qualified for use in their stations overall composite same. Enough qualifying sample volume was collected at each station to permit analysis of all intended composite sample analytes. Composite sample formulation of all the monitoring stations was conducted in a routine manner. Composite samples were not collected at PSNS096 during STE#5 due to high conductivity conditions, nor at PSNS015 during STE#6 due to an enable setting issue (see Section 9).

Composite sample analytical parameters included: hardness, TOC, DOC, TSS, total and dissolved metals and turbidity (when not measured by bench-top meter). A small portion from each of the overall composite samples was poured off for the assessment of its resultant

conductivity and turbidity values. Specific details of the composite formulation, results from individual bench top testing of the discrete bottles, as well as sample IDs, sample date/time and resultant overall conductivity and turbidity values, are detailed in the *Stormwater Field Sampling Forms* and in Table A-1A and A-1B (all are attached). Tables 4A and 4B summarize these results.

Table 4A. Composite Sampling Details for STE#5

Sample Collection Criteria:	PSNS008	PSNS015	PSNS032
Composite sample ID	SW05-0005	SW05-0007	SW05-0008
Composite Date /Time	3/8/2011 8:55	3/8/2011 11:39	3/8/2011 9:04
Overall Composite conductivity value (μS/cm)	36	374	79
Composite volume (ml)	2500	6000	4720
Composite parameters collected per PSNS PWP?	Yes	Yes	Yes

Table 4B. Composite Sampling Details for STE#6

Sample Collection Criteria:	PSNS032	PSNS096
Composite sample ID	SW06-0002	SW06-0010
Composite Date /Time	3/10/2011 5:13	3/10/2011 1:11
Overall Composite conductivity value (μS/cm)	51	605
Composite volume (ml)	8000	8000
Composite parameters collected per PSNS PWP?	Yes	Yes

All sampling and vault monitoring equipment operated as designed and programmed. Details pertaining to autosampler programming and event-specific operation of each monitoring station autosampler unit are contained in the attached *Sampler Reports* for both STE#5 and STE#6.

QC Samples:

Duplicates for both grab and composite sample portions were collected during both STE#5. Methods and procedures for the collection of these quality control samples were completed in accordance with Section 10.1 of the 2010-11 PWP. A grab sample duplicate was collected at PSNS032 and a composite sample duplicate was collected at PSNS008. The *Stormwater Field Sampling Forms* and Table A-1A (all are attached) contain details regarding the QC Samples

associated with STE#5. Table 5 summarizes the quality control sample collection information for STE#3.

Table 5. Summary of Quality Control Sampling Information

Sample Collection Criteria:	PSNS008	PSNS032
Grab sample duplicate ID	SW05-0004	NA
Grab sample duplicate date and time	3/8/2011 8:55	NA
Grab sample duplicate conductivity value ($\mu\text{S}/\text{cm}$)	175	NA
Composite sample duplicate ID	NA	SW05-0006
Composite sample duplicate date and time	NA	3/8/2011 8:55
Was additional volume collected for MS/MSD analysis (grab, comp or both)?	NA	No
Overall Composite Duplicate conductivity value ($\mu\text{S}/\text{cm}$)	NA	37
Composite Duplicate volume (ml)	NA	2500

Sample Management:

All samples were handled and managed as per Section 9 of the PWP and in a manner acceptable and within industry standards regarding practices typical for tasks of this nature. Once collected, both grab and composite samples were placed into coolers and put on ice and/or into the Stormwater Laboratory refrigerator to maintain temperatures between 2 and 6 °C.

All sample IDs, collection date and time, matrix, requested parameter analysis and other associated information were documented on *Chain-of-Custody (CoC) forms* (attached). Samples were in direct control of project and/or laboratory personnel at all times. Samples were delivered to the testing facility, Battelle Marine Science Laboratory in Sequim, WA, in good, useable and properly chilled condition. Adequate sample volume was collected from the targeted stations to proceed with the scheduled analysis of all parameters per the 2010-11 PWP.

Sample Validation Summary:

All sample validation criteria were met for this event per Section 8.2.6 of the 2010-11 PWP. Prior to processing the samples and transferring custody to the analytical laboratory, the Taylor/TEC Field Event Lead validated the samples against certain criteria. These validation criteria included runoff occurrence / hydrograph stage, sample preparation and handling review, requested parameters, ≥ 2 hour sampling duration or 75% storm hydrograph coverage, minimum number of aliquots, minimum sample volume collected for required parameters, discrete and composite samples conductivity measurement results, quality control sample collection and anomalous conditions assessment. Tables A-1A and A-1B (*Storm Qualification and Sample Validation Information Checklist*), document the particular STE qualifications listed above.

7.0 Basin Runoff Calculations

Rainfall runoff volumes were calculated for each of the basins associated with the monitoring stations associated with STE#5 and STE#6. These calculations are based on the Runoff Coefficient Method (RCM) as described in Section 7.4 of the 2010-11 PWP.

The RCM uses a formula that incorporates a coefficient that has a certain predetermined range of possible values. This range of values is assigned based primarily on the land use/land cover of a particular basin. In calculating the runoff volumes for both STE#5 and STE#6, the greatest runoff coefficient values for each land use/land cover category associated with the monitored basins were applied. The value ranges for the various land use/land cover categories assigned to each basin are listed in the attached *Runoff Calculation Tables*. Tables 6A and 6B summarize the results from these calculations.

Table 6A. Monitoring Station Runoff Volume Calculations for STE#5

Station	Combined Drainage Area (Ft ²)	STE Rain Total (In)	STE Rain Total (Ft)	STE Runoff Vol. (Gal)	Sample Event Rain Total (In)	Sample Event Rain Total (Ft)	Sample Event Runoff Vol. (Gal)	% of Runoff Sampled During STE
032	184,658	0.17	0.0142	19,569	0.12	0.0100	13,813	71
015	2,411,321	0.17	0.0142	255,537	0.08	0.0067	120,253	47
008	429,637	0.19	0.0158	50,887	0.15	0.0125	40,174	79

Table 6B. Monitoring Station Runoff Volume Calculations for STE#6

Station	Combined Drainage Area (Ft ²)	STE Rain Total (In)	STE Rain Total (Ft)	STE Runoff Vol. (Gal)	Sample Event Rain Total (In)	Sample Event Rain Total (Ft)	Sample Event Runoff Vol. (Gal)	% of Runoff Sampled During STE
096	635,317	2.39	0.1992	946,540	1.78	0.1483	704,954	74
032	184,658	2.05	0.1708	235,979	1.56	0.1300	179,574	76
015	2,411,321	2.21	0.1842	3,321,986	NA	NA	NA	NA

8.0 Descriptive Statistics and Discussion of the Event Station Monitoring Data

Descriptive statistics for the sampling period at each monitoring station are provided in Tables 7A and 7B. These statistics include minimum, maximum, average and median for 5-minute interval rainfall data, vault level, conductivity, salinity, transducer water temperature, YSI water

temperature (PSNS096 only) and tidal stage. Sampling period rainfall totals, as well as maximum 1-hour intensity and average 1-hour intensity (includes intra-event dry periods) are also included as part of each station's rainfall information.

Table 7A. Sampling Period Rainfall and Vault Parameter Descriptive Statistics, STE#5

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (μS/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
PSNS008 min	0			0.32	0	2	5.37		8.80
max	0.01			2.65	58	2	6.39		11.40
average	0.003			1.71	8	2	5.73		10.51
median	0			1.90	0	2	5.63		10.70
total	0.15	0.07	0.030						
PSNS015 min	0			0.32	28	2	6.51		3.00
max	0.01			8.23	3,087	2	10.61		11.40
average	0.001			5.73	382	2	7.42		8.76
median	0.000			6.70	69	2	6.76		10.00
total	0.08	0.06	0.017						
PSNS032 min	0			0.23	41	2	6.13		8.60
max	0.01			2.73	271	2	8.10		11.40
average	0.002			1.85	78	2	6.81		10.55
median	0.000			2.02	63	2	6.73		10.80
total	0.12	0.07	0.027						

¹salinity calculation for PSNS008, 015 and 032 is based on an algorithm that has a lower range cut-off value of 2ppt. Actual field values may have been lower.

Table 7B. Sampling Period Rainfall and Vault Parameter Descriptive Statistics, STE#6

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (μS/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
PSNS032 min	0			-0.09	3	2	7.43		1.10
max	0.08			6.04	39,169	37	10.76		11.20
average	0.005			1.05	3,132	5	9.38		6.96
median	0.000			0.51	12	2	9.50		7.30
total	1.56	0.28	0.065						

Table 7B. Sampling Period Rainfall and Vault Parameter Descriptive Statistics, STE#6

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity ($\mu\text{S}/\text{cm}$)	¹ Salinity (ppt)	trans temp ($^{\circ}\text{C}$)	YSI temp ($^{\circ}\text{C}$)	Tide Stage (ft)
PSNS096 min	0			0.14	36	0	7.50	7.58	1.10
max	0.09			8.99	41,279	41	13.17	13.48	11.20
average	0.006			5.04	19,114	19	9.29	9.40	7.00
median	0.000			5.63	3,566	3	9.01	9.02	7.70
total	1.78	0.22	0.074						

¹salinity calculation for PSNS008, 015 and 032 is based on an algorithm that has a lower range cut-off value of 2ppt. Actual field values may have been lower. PSNS096 used a conductivity probe (YSI6820) that utilized a different salinity algorithm function and thus is able to calculate lower low range salinity values.

Hydrograph Assessment:

STE#5: The hydrographs (see attached) for all three STE#5 monitoring stations showed very similar rainfall signatures and vault responses to the single event of approximately 0.2" of rain depth. Although the tide stage was beginning to rise with the onset of the storm, the rainfall depth, although small, was enough to "push" the saline wedge further downstream from the sampling intakes. PSNS 008 and PSNS032 both show nearly the same shape and duration of their hydrograph curves. Both of these stations showed sharp rises at the beginning of the storm and nearly matching falling limbs (again in shape and duration) back to base flow as the storm event ended. The storm start and duration coincided with one segment (high-high portion) of the diurnal tide cycle. Even with this small amount of rain and rising tide, the pipe storage effect is noticeable at these two monitoring stations.

PSNS015 has a somewhat different hydrograph curve shape that illustrates the effects that the greater basin size has on the rainfall/ runoff relationship. This station shows a more gradual rising and falling limb to its curve, with an increased runoff time after the end of the rainfall (4 hours vs. 1-2 hours at the other stations). Freshwater storage effects at this location are less evident in pipe / tide stage comparison vs. the comparison between tide stage / effective level and conductivity / temperature readings.

Grab samples were collected during the falling limb of each of the stations hydrographs, at points elevated above baseflow conditions. Conductivity values indicated that a freshwater state occurred during the grab collection periods at all of the monitoring stations. Sample marker and grab sampling indications have been applied to the hydrographs (see attached).

STE#6: The initial runoff response at PSNS032 was not very noticeable after 0.27" of rain and corresponding runoff had occurred. This was likely due to the tide stage being below the effective tide height of the station (9.4'amsl). Once the tide started to rise and reach the stations effective

level a hydrograph curve indicative of pipe storage is noted. An additional burst of over 0.5" of rainfall caused a non-storage level spike around 1130 on March 9th. Once the rain stopped there was an intra-event dry period between 1200 and approximately 1845. Again the tide surged above the effective level and a tidal effect hydrograph is noted. Along with this tide surge a two-hour spike in conductivity is seen between 1845 and 2100. Moderate to heavy rainfall returned for the duration of the sampling event; sharp spikes are noted corresponding to rain surges. Once the rain began to tail off after 0400 on March 10th the station hydrograph returns to a typical tidally dominated signature.

Vault data from PSNS096 shows the power of the tide even during a large storm event. The event hydrograph remains in a typical tidally dominated state for much of the storm event. Only when rainfall surges of 0.6" to 0.8" occur with corresponding falling tides do the conductivity conditions at the station qualify for freshwater sample collection.

Grab sampling during STE#6 at both of the stations was conducted under freshwater conditions while intra-event runoff was occurring.

Telemetry System Metadata:

A review of the telemetry data collected during STE#5 indicated that PSNS008 was the only station having any data collection issues associated with the vault or rain gauge sensors. These issues were considered to be minor since system enabling and collection of qualified samples were not affected. A Review of the data from PSNS008 revealed that there was a three hour gap in salinity readings due to negative drift in the conductivity sensor. This drift was only noted when conductivity values were in a very low range (hovering below 2.4 $\mu\text{S}/\text{cm}$, which is considered to be very low salinity conditions). However, once there was even a slight shift in the salinity concentration of the incoming vault water (in correlation to tidal effects), the conductivity probe responded as designed, and thus the salinity values became positive. This was considered to be a calibration refinement issue that was also noted during the last event. Progress has been made in resolving the issue – last event the conductivity drop out was occurring at values below 50 $\mu\text{S}/\text{cm}$. A review of the other STE#5 and STE#6 stations indicated that no other data anomalies were identified.

9.0 Notable Anomalies and Variations to the PWP

The only notable anomaly occurred at PSNS015 during STE#6. As described above, after the rainfall stopped at the conclusion of STE#5 and the station hydrographs returned to base flow the samplers were halted via telemetry. It was decided by the Project Team that the 15 remaining bottles in the sampler bases at PSNS015 and PSNS032 could be used to collect samples from the quickly approaching event forecast to be STE#6. Logistics of fielding a team and difficulties in obtaining the additional laboratory cleaned bottles helped to facilitate this decision. The pacing rates were already set at 15-minutes from the previous event. However, each station has a number of storm reset "switches" (that ironically are used to safeguard against premature or

unintended sample initiation). Resetting these “switches” involves entering a value, sending that value to the datalogger and receiving confirmation from the logger that the new value or reset command was accepted. It is unclear exactly what occurred in that chain of events, but it is likely that the commands were sent and the telemetry connection was terminated before receipt that the command confirmation was obtained (and thus executed). See the attached *Storm Controllers Notes* for details regarding the chain of events during storm control activities.

There were no other anomalies observed that would have otherwise caused any of the STE#5 or STE#6 samples to be non-representative of the conditions from which they were collected. As reported above, all intended and scheduled grab and composite samples were submitted to the MSL within holding times and without incident. All support and sampling tasks, as well as collected samples, were managed as appropriate per the PWP.

10.0 Action Items

STE#5 and STE#6 were the second and third (fifth and sixth overall) of three scheduled storm events at the current monitoring stations. Based on a review of the remaining project resources a Project Team decision was made to storm target and collect samples from one additional rain event. This seventh event will be conducted at the four currently operational monitoring stations (PSNS008, 015, 032 and 096).

Routine action items include resetting (reloading with bottles, charging batteries, back flushing with DI water, etc.) all four monitoring stations and re-stocking of sampling supplies. Routine station maintenance items (e.g. sensor cleaning and calibration, rain gauge maintenance, etc.) as well as storm set-up tasks will need to be completed as necessary. Non-routine action items include trouble shooting the conductivity sensor calibration issue at PSNS008.

The current focus of the field efforts will be in maintaining proper station and equipment operational status, data and resource management and storm-tracking tasks.



Figure 1. Stormwater Monitoring Locations within the Shipyard Boundary

ATTACHMENTS

- Storm Qualification and Sample Validation Information Checklist
- Stormwater Field Sampling Forms and Controller Notes
- Chain-of-Custody Forms
- Runoff Calculation Worksheet
- Station Hydrographs
- Autosampler Reports
- Weather Forecast Information

**Table A-1A. PSNS Non-Dry Dock Stormwater Monitoring Tasks
Storm and Sample Information and Validation Checklist
Stormwater Sampling Event #5 (3-8-2011)**



This form acknowledges representativeness criteria described in the project PWP.

Mark with "Yes" to acknowledge acceptable, "No" for not acceptable, "NA" or "-" if not applicable.

Storm Event Data:					
Project Storm Event (STE) #	5				
Event Forecast Probability (%)	87				
PSNS C106 Rain Gauge - Storm Event Total (in.)	0.19				
Rainfall and Runoff Summary:		PSNS008	PSNS015	PSNS032	PSNS096
Last Runoff (≥ 0.03 " rainfall without 6-hr gap) Prior to STE Start (days:hrs:min)	3:4:35	3:4:50	3:5:25	3:5:25	
Antecedent Dry Period (days: hrs: mins)	3:4:35	3:4:50	3:5:25	3:5:25	
Rainfall Prior 24-hrs to Sampling Start	0.00	0.00	0.00	0.00	
Rainfall Prior 6-hrs to Sampling Start	0.00	0.00	0.00	0.00	
STE Start Date & Time	3/8/11 3:35	3/8/11 3:40	3/8/11 3:35	3/8/11 3:35	
STE Duration (days:hrs:mins)	0:3:20	0:3:00	0:4:15	3:05	
STE End Date & Time	3/8/11 06:55	3/8/11 06:40	3/8/11 07:50	3/8/11 06:40	
Period Between Next Measureable Rain (days:hrs: mins)	0:17:40	0:17:45	0:16:35	0:17:40	
Storm Event Total Rainfall (in)	0.19	0.17	0.17	0.16	
Storm Event Max 1-hr Rainfall Intensity (in/hr)	0.07	0.07	0.06	0.07	
Storm Event Average 1-hr Rainfall Intensity (in/hr)	0.057	0.057	0.040	0.052	
Sampling Period Total Rainfall (in)	0.15	0.08	0.12	NA	
Sampling Period Max 1-hr Rainfall Intensity (in/hr)	0.07	0.06	0.07	NA	
Sampling Period Average 1-hr Rainfall Intensity (in/hr)	0.030	0.017	0.027	NA	
Runoff volume calculated for entire storm period (gallons)	50,887	255,537	19,569	63,367	
Runoff volume calculated for sampling period (gallons)	40,174	120,253	13,813	NA	
Percentage of total storm runoff utilized during sampling period	79%	47%	71%	NA	
Sample Collection Criteria:					
Grab sample ID	SW05-0001	SW05-0002	SW05-0003	N/A	
Grab Date /Time	3/8/2011 8:30	3/8/2011 9:34	3/8/2011 8:50	N/A	
Grab sample conductivity value ($\mu\text{S}/\text{cm}$)	55	68	175	N/A	
Hydrograph stage at grab collection	Falling limb	Falling limb	Falling limb	N/A	
Grab parameters collected per PSNS PWP ?	Yes	Yes	Yes	N/A	
Composite sample ID	SW05-0005	SW05-0007	SW05-0008	N/A	
Composite Date /Time	3/8/2011 8:55	3/8/2011 11:39	3/8/2011 9:04	N/A	
Overall Composite conductivity value ($\mu\text{S}/\text{cm}$)	36	374	79	N/A	
Composite volume (ml)	2500	6000	4720	N/A	
Composite parameters collected per PSNS PWP ?	Yes	Yes	Yes	N/A	
QC Sample Summary Information:					
Grab sample duplicate ID	N/A	N/A	SW05-0004	N/A	
Grab sample duplicate date and time	N/A	N/A	3/8/2011 8:55	N/A	
Grab sample duplicate conductivity value ($\mu\text{S}/\text{cm}$)	N/A	N/A	175	N/A	
Composite sample duplicate ID	SW05-0006	N/A	N/A	N/A	
Composite sample duplicate date and time	3/8/2011 8:55	N/A	N/A	N/A	
Was additional volume collected for MS/MSD analysis (grab, comp or both) ?	No	N/A	N/A	N/A	
Overall Composite Duplicate conductivity value ($\mu\text{S}/\text{cm}$)	37	N/A	N/A	N/A	
Composite Duplicate volume (ml)	2500	N/A	N/A	N/A	
Storm and Sample Validation:					
Was the targeted STE antecedent qualified per PSNS PWP? (if no, then see next line)	Yes	Yes	Yes	Yes	
Was the antecedent overage amount greater than 10% of the total rain event ?	N/A	N/A	N/A	N/A	
Was runoff occurring OR was the hydrograph at least 10% above background pipe level during grab collection ? If no, explain in summary narrative.	Yes	Yes	Yes	N/A	
Were a minimum of 8 aliquots collected OR does the composite sample represent at least 75% of the stations storm event rain volume ?	Yes	Yes	Yes	N/A	
Were all 1-hr sampler bottles used for the Composite sample $\leq 2000 \mu\text{S}/\text{cm}$?	Yes	Yes	Yes	N/A	
Did any anomalous conditions exist that could make samples non-representative? Explain if "Yes"	No	No	No	N/A	
Based on consideration of the information above, was the sample collected during the STE valid for project purposes ? (Y / N, composite, grab or both)	Yes-both	Yes-both	Yes-both	N/A	

¹ If the answer to any of these questions is "No" OR indicate non-representative conditions, then these items should be explained in the Event Narrative.

Validation Check List Completed By / Date:

Pete Heltzel

Reveiwed By / Date:

RD C. Metcalfe 4-6-2011

**Table A-1B. PSNS Non-Dry Dock Stormwater Monitoring Tasks
Storm and Sample Information and Validation Checklist
Stormwater Sampling Event #6 (3-9-2011)**

This form acknowledges representativeness criteria described in the project PWP.

Mark with "Yes" to acknowledge acceptable, "No" for not acceptable, "NA" or "-" if not applicable.

¹ Storm Event Data:					
Project Storm Event (STE) #	6				
Event Forecast Probability (%)	90 - 100				
PSNS C106 Rain Gauge - Storm Event Total (in.)	2.60				
Rainfall and Runoff Summary:		PSNS015	PSNS032	PSNS096	N/A
Last Runoff (≥ 0.03" rainfall without 6-hr gap) Prior to STE Start (days:hrs:min)	0:17:45	0:16:35	0:17:40		
Antecedent Dry Period (days: hrs: mins)	0:17:45	0:16:35	0:17:40		
Rainfall Prior 24-hrs to Sampling Start (in)	0.18	0.17	0.16		
Rainfall Prior 6-hrs to Sampling Start (in)	0.00	0.00	0.00		
STE Start Date & Time	3/9/11 0:25	3/9/11 0:25	3/9/11 0:20		
STE Duration (days:hrs:mins)	1:16:25	1:15:20	1:15:25		
STE End Date & Time	3/10/11 16:50	3/10/11 15:45	3/10/11 15:45		
Period Between Next Measureable Rain (days:hrs: mins)	1:4:55	1:6:00	1:4:35		
Storm Event Total Rainfall (in)	2.21	2.05	2.39		
Storm Event Max 1-hr Rainfall Intensity (in/hr)	0.32	0.29	0.36		
Storm Event Average 1-hr Rainfall Intensity (in/hr)	0.055	0.052	0.084		
Sampling Period Total Rainfall (in)	N/A	1.56	1.78		
Sampling Period Max 1-hr Rainfall Intensity (in/hr)	N/A	0.28	0.22		
Sampling Period Average 1-hr Rainfall Intensity (in/hr)	N/A	0.065	0.074		
Runoff volume calculated for entire storm period (gallons)	3,321,986	235,979	946,540		
Runoff volume calculated for sampling period (gallons)	N/A	179,574	704,954		
Percentage of total storm runoff utilized during sampling period	N/A	76%	74%		
¹ Sample Collection Criteria:					
Grab sample ID	N/A	SW06-0001	SW06-0009		
Grab Date /Time	N/A	3/9/2011 13:10	3/9/2011 13:40		
Grab sample conductivity value (µS/cm)	N/A	123	219		
Hydrograph stage at grab collection	N/A	Intra-event runoff	Intra-event runoff		
Grab parameters collected per PSNS PWP ?	N/A	Yes	Yes		
Composite sample ID	N/A	SW06-0002	SW06-0010		
Composite Date /Time	N/A	3/10/2011 5:13	3/10/2011 1:11		
Overall Composite conductivity value (µS/cm)	N/A	51	605		
Composite volume (ml)	N/A	8000	8000		
Composite parameters collected per PSNS PWP ?	N/A	Yes	Yes		
¹ QC Sample Summary Information:					
Grab sample duplicate ID	N/A	N/A	N/A		
Grab sample duplicate date and time	N/A	N/A	N/A		
Grab sample duplicate conductivity value (µS/cm)	N/A	N/A	N/A		
Composite sample duplicate ID	N/A	N/A	N/A		
Composite sample duplicate date and time	N/A	N/A	N/A		
Was additional volume collected for MS/MSD analysis (grab, comp or both) ?	N/A	N/A	N/A		
Overall Composite Duplicate conductivity value (µS/cm)	N/A	N/A	N/A		
Composite Duplicate volume (ml)	N/A	N/A	N/A		
¹ Storm and Sample Validation:					
Was the targeted STE antecedent qualified per PSNS PWP? (if no, then see next line)	N/A	No	No		
Was the antecedent overage amount greater than 10% of the total rain event ?	N/A	No	No		
Was runoff occurring OR was the hydrograph at least 10% above background pipe level during grab collection ? If no, explain in summary narrative.	N/A	Yes	Yes		
Were a minimum of 8 aliquots collected OR does the composite sample represent at least 75% of the stations storm event rain volume ?	N/A	Yes	Yes		
Were all 1-hr sampler bottles used for the Composite sample ≤2000 µS/cm ?	N/A	Yes	Yes		
Did any anomalous conditions exist that could make samples non-representative? Explain if "Yes"	N/A	No	No		
Based on consideration of the information above, was the sample collected during the STE valid for project purposes ? (Y / N, composite, grab or both)	N/A	Yes-both	Yes-both		

¹ If the answer to any of these questions is "No" OR indicate non-representative conditions, then these items should be explained in the Event Narrative.

Validation Check List Completed By / Date:

Pete Heltzel

Reviewed By / Date:

Michael J. Metcal 4-5-2011



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

ver.020411

Station: PSNS 008	MH/CB#: 2179	Loc. Descrip. Parking area B550	Page: 1 of 2
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Section 1. Station Reset and Inspection

Personnel: DM/BR	Weather: Partly sunny, 40's, lgt breeze	Arrival Date/Time: 3-7-11 (1138)
Carry-over maintenance to do prior to set-up: Resets	done? Y	
Sampler Battery Voltage	12.77	Changed? Y (N) Fresh
Modem Battery Voltage	13.82	Changed? Y (N)
Sample Tubing & Strainer OK?	Yes	Sampler Info.
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)
Trans. Cable OK?	OK	+2 mins
Trans. Desiccant OK (Yes/No)	Yes	Internal Sampler Tubing OK?
Telem. Box Desiccant OK (Yes/No)	Yes	GOOD - next STE
Modem Status	Operational	Tubing Replaced? (Yes/No)
		No
		Normal Smlr Program or Dup. ?
		DUP
		Bottles Loaded ?
		Yes
Notes (including channel condition):		Lid Status?
Rain Gauge cleaned & lvl'd		off
		Backflushed with DI?
		Yes
		Suction line & quick connect attached?
		Yes
		Smlr Status (on/off) / last screen..
		Prog Dis 1212 Mon 7 Mar...

Section 2. Storm Setup and Inspection

Personnel: DM/BR	Weather: Same	Arrival Date/Time: 3-7-11 (1138)
Sampler Battery Voltage	Same as above	Changed? Y N
Modem Battery Voltage		Changed? Y N
Sample Tubing & Strainer OK?		Sampler Setup
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)
Transducer Cable OK?	Yes	+2 mins
Multi-meter Cable OK	NA	Aliquot Vol. Cal'd (Y/N & vol.)
Recorded Level (FT)	0.58'	No
Measured Level (FT)	0.06'	Program Reviewed (Yes/No), Dup ?
Offset Diff (FT)	0.5192 new = 0.5192	Yes - DUP
Level Adjusted ?	Yes	Lids off bottles?
Cond. Sonde Type (YSI6820 or INW-CT2X)	INW	off yes
Cond. Sonde Cal. Info. : Recorded Val. = 34,510 Meas. Val. = NA Diff. = NA (>10% adj. offset); Offset = NA New Rec Val = NA		Diagnostics/Distributor arm check?
		Yes
		Backflush with DI?
		Yes
		Storm Reset (1, enter) Completed
		Yes - ready
		Last screen... Prog Dis 1212 Mon 7 Mar...
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) No cond. cal.		

Section 3. Grab Sample Collection

Personnel: E Mollerstuen/Young	Weather: Damp stopped raining	Arrival Date/Time: 0825 3/8/11
On Composite... (Bottle #/ Aliq #)	4, 8 BTLs 5-6	Conductivity Reading (µS/cm):
Grab Parameters Collected	PC, TPH	SS µS
Grab Sample ID	PSNS008	Salinity Reading (PPT):
Grab Date/Time	3/8/11 0830	23.6 NTU FM
Grab Dup ID	NA	Temp. Reading (°C):
Grab Dup Date/Time	NA	—
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?:	Sediment in sample	Turbidity Reading (NTU)
Storm Controller notified (Y or N/A)?	Y	23.6 NTU
		Equipment running correctly?
		Yes
		Sampler Battery Voltage (Changed?):
		Good
Grab MS/MSD Collected ? Y / (N) Ice OK? OK		
Notes: (what meter was used for site readings, etc.) Same as comp. meter		

Station: PSNS008 continued from previous page

 Page: 2 of 2
Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM/BR</u>	Weather: <u>Raining !! 40's, windy</u>	Arrival Date/Time: <u>3-9-11 (1030)</u>
Sampler Battery Voltage	<u>good</u>	Changed? Y <u>N</u> <u>pulled</u>
Telemetry Battery Voltage	<u>good</u>	Changed? Y <u>(N)</u>
Additional Grabs (IDs, date/time)	<u>NA</u>	New voltage <u>—</u>
Additional Dup Grab (IDs, date/time)	<u>NA</u>	New voltage <u>—</u>
Composite Begin Time (date/time)	<u>3-8-11 (0411)</u>	Sampler Report Downloaded? <u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>BTL's 5+6 (Dup) 4 of 8 (0855)</u>	
Total Composite Sample Volume Collected	<u>12 btl's total 10 full, 2 half full - these were split pairs for dup</u>	
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>3-8 BTL's 5-6 aliq's 5 thru 8 = NL</u>	
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK-good-clear</u>		
Storm Contoller notified (Y or N/A)? <u>NA</u>	Which parameter?: <u>NA</u>	
Notes: <u>Collected both grab + comp duplicates. Stopped smpling via telemetry @ btl 10 - rain had stopped</u>		
Maintenance Needed: <u>Typical Resets</u>		

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>DM/BR</u>	Date/Time: <u>3-9-11 (1215)</u>
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal.info.) <u>Cond. = YSI 556 ser 0651594AC</u> <u>Turb = Hach 2100P ser. = 06070C018410</u>	
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smpl be included in comp smpl Y/N):	
1. <u>43/23/Yes</u>	2. <u>40/23/Yes</u>
3. <u>29/33/Yes</u>	4. <u>28/34/Yes</u>
5. <u>50/23/Yes</u>	6. <u>50/24/Yes</u>
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Used btl's 1, 3 + 5 for "normal" sample</u> <u>Used btl's 2, 4 + 6 for "Duplicate" sample</u>	
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>Cond = 36 $\mu\text{S}/\text{cm}$ Turb = 30 NTU Vol. = 2500 ml, Analysis per PWP</u>	
Composite Sample ID & Time: <u>SW05-0005 (0855) 3-8-11</u>	
Field Blank Collected? (date/time)	<u>NO</u>
Blank ID:	<u>NA</u>
Duplicate comp sample? Yes/No	<u>Yes</u>
Duplicate sample ID	<u>SW05-0006 (Dup of SW05-0005)</u>

NOTES:

(0855) 3-8-11
 Dup Comp Readings: Cond. = 37 $\mu\text{S}/\text{cm}$ Turb: 29 NTU
 Vol. = 2500 ml, Analysis per PWP



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

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Station: PSNS015	MH/CB#: A42	Loc. Descrip. McDs drive thru lane	Page: 1 of 2
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pages per station

Section 1. Station Reset and Inspection			
Personnel: DM/BR		Weather: Overcast, 40's, lite breeze	
		Arrival Date/Time: 3-7-11 (1030)	
Carry-over maintenance to do prior to set-up: NA			done? NA
Sampler Battery Voltage	-12.60 - 12.76	Changed? Y (N)	New voltage Fresh
Modem Battery Voltage	13.55	Changed? Y (N)	New voltage NA
Sample Tubing & Strainer OK?	Yes	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	+1 min
Transds. Cable OK?	Yes	Internal Sampler Tubing OK?	Yes
Transds. Desiccant OK (Yes/No)	Yes	Tubing Replaced? (Yes/No)	No
Telem. Box Desiccant OK (Yes/No)	Yes	Normal Smpler Program or Dup. ?	Normal
Modem Status ^①	Operational - but power cycled	Bottles Loaded ?	Yes
Notes (including channel condition): ① Connection issue warranted power cycling, operational again		Lid Status?	Off
- Cleaned & lub'd rain gage		Backflushed with DI?	Yes
		Suction line & quick connect attached?	Yes
		Smplr Status (on/off) / last screen..	Prp'm Dis. 1048 3-7

Section 2. Storm Setup and Inspection			
Personnel: DM/BR		Weather: Same as above	
		Arrival Date/Time: 3-7-11 (1030)	
Sampler Battery Voltage	Same as above	Changed? Y N	New voltage
Modem Battery Voltage	↓	Changed? Y N	New voltage
Sample Tubing & Strainer OK?	↓	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	+1 min
Transducer Cable OK?	Yes	Aliquot Vol. Cal.'ed (Y/N & vol.)	Yes 240-ml
Multi-meter Cable OK	NA	Program Reviewed (Yes/No), Dup ?	Yes - Normal
Recorded Level (FT)	.837	Lids off bottles?	Off
Measured Level (FT)	1.05	Diagnostics/Distributor arm check?	Yes
Offset Diff (FT)	0.213 = new value	Backflush with DI?	Yes
Level Adjusted ?	Yes	Storm Reset (1, enter) Completed	Yes - ready
Cond. Sonde Type (YSI6820 or INW-CT2X)	INW	Last screen...	Prp'm Dis 1048 Mon 7 Mar...
Cond. Sonde Cal. Info. : Recorded Val. = 3364 Meas. Val. = NA Diff. = NA (>10% adj. offset); Offset = NA New Rec Val = NA			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) No cond. cal.			

Section 3. Grab Sample Collection			
Personnel: Mollerstrom/Beckwith		Weather: Stopped raining	
		Arrival Date/Time: 3/8/11 0930	
On Composite... (Bottle #/ Aliq #)		Conductivity Reading (µS/cm):	68 µS
Grab Parameters Collected	FC/TPH	Salinity Reading (PPT):	-
Grab Sample ID	PSNS015	Temp. Reading (°C):	-
Grab Date/Time	3/8/11 934	Turbidity Reading (NTU)	17.4 NTU
Grab Dup ID	NA	Equipment running correctly?	Yes
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	Good
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: Slightly turbid / Slight sheen			
Storm Controller notified (Y or N/A)?:	Y	Grab MS/MSD Collected ? Y / (N)	Ice OK? Yes
Notes: (what meter was used for site readings, etc.) Same as comp. meter			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: ~~DM/BR~~ PSNS 015 continued from previous page

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Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: DM/BR	Weather: Raining, 40°s, windy	Arrival Date/Time: 3-9-11 (1055)
Sampler Battery Voltage	good	Changed? Y N pulled
Telemetry Battery Voltage	12.5 +	Changed? Y (N)
Additional Grabs (IDs, date/time)	No	
Additional Dup Grab (IDs, date/time)	No	
Composite Begin Time (date/time)	3-8-11 (0455)	Sampler Report Downloaded? Yes
Last Aliquot Taken (date/time, bott #, aliq #)	3-8-11 (1339) bottle 9 4/4	
Total Composite Sample Volume Collected	9 full btls	
Aliquots missed/NLD (date/time/bott #/aliq #)	NONE	
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? Normal -OK		
Storm Contoller notified (Y or N/A)?	Which parameter?:	NA
Notes: Stop sampl. via telem. @ beginning of btl 10 - rain had stopped for several hours		
Maintenance Needed: Reset tasks		

Section 5. Compositing Scheme and QC Sampling

Personnel: DM / BR	Date/Time: 3.9.11 (1315)
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.) YSI 556 ser# 06J1594AC = Cond meter Turb = Hach 2100P ser. # 06070C018410	
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smpl be included in comp smpl Y/N):	
1. 2935/16/ No	7. 1330/10/ Yes
2. 115/28/ Yes	8. X not used 2
3. 72/14/ Yes	9. X not used 3
4. 47/24/ Yes	
5. 58/20/ Yes	
6. 645/12/ Yes	
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) Used btl's 2-7; btl's 8+9 were base flow	
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) COND = 374 $\mu\text{S}/\text{cm}$ NTU = 23 Turb vol. = ~6000ml, Analysis per PWP	
Composite Sample ID & Time: SW05-0007 (1139) 3-8-11	
Field Blank Collected? (date/time)	NA
Blank ID:	NA
Duplicate comp sample? Yes/No	No
Duplicate sample ID	NA

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

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Station: <u>PSNS 032</u>	MH/CB#: <u>5691</u>	Loc. Descrip. <u>NW corner B514</u>	Page: <u>1</u> of <u>2</u>
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Section 1. Station Reset and Inspection			
Personnel: <u>DM/BR</u>	Weather: <u>Overcast, 40's, lte breeze</u>	Arrival Date/Time: <u>3-1-11 (1228)</u>	
Carry-over maintenance to do prior to set-up: <u>Smplr DL cable, resets</u>			done? <u>Y</u>
Sampler Battery Voltage	<u>12.71</u>	Changed? <u>Y</u> (N) <u>fresh</u>	New voltage <u>—</u>
Modem Battery Voltage	<u>12.94</u>	Changed? <u>Y</u> (N)	New voltage <u>—</u>
Sample Tubing & Strainer OK?	<u>Yes</u>	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	<u>+3 min</u>
Transds. Cable OK?	<u>Yes</u>	Internal Sampler Tubing OK?	<u>Good ▽ next time</u>
Transds. Desiccant OK (Yes/No)	<u>Yes</u>	Tubing Replaced? (Yes/No)	<u>No</u>
Tele. Box Desiccant OK (Yes/No)	<u>Yes</u>	Normal Smplr Program or Dup. ?	<u>Normal</u>
Modem Status	<u>Operational</u>	Bottles Loaded ?	<u>Yes</u>
Notes (including channel condition): <u>- ▽ internal batt. time permitting</u> <u>- Rain gauge ins'ped - 1/1 & buckets good</u>		Lid Status?	<u>OFF</u>
		Backflushed with DI?	<u>Yes</u>
		Suction line & quick connect attached?	<u>Yes</u>
		Smplr Status (on/off) / last screen..	<u>Prgrm Dis 1317 3-1-11</u>

Section 2. Storm Setup and Inspection			
Personnel: <u>DM/BR</u>	Weather: <u>Same as above</u>	Arrival Date/Time: <u>3-7-11 (1228)</u>	
Sampler Battery Voltage	<u>Same as above</u>	Changed? <u>Y</u> <u>N</u>	New voltage
Modem Battery Voltage		Changed? <u>Y</u> <u>N</u>	New voltage
Sample Tubing & Strainer OK?	<u>↓</u>	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	<u>+3 min</u>
Transducer Cable OK?	<u>Yes</u>	Aliquot Vol. Cal.'ed (Y/N & vol.)	<u>No - NO water</u>
Multi-meter Cable OK	<u>NA</u>	Program Reviewed (Yes/No), Dup ?	<u>Yes - normal</u>
Recorded Level (FT)	<u>-0.16</u>	Lids off bottles?	<u>Yes</u>
Measured Level (FT)	<u>0.00</u>	Diagnostics/Distributor arm check?	<u>Yes</u>
Offset Diff (FT)	<u>0.16 new = -0.265</u>	Backflush with DI?	<u>Yes</u>
Level Adjusted ?	<u>Yes</u>	Storm Reset (1, enter) Completed	<u>Yes - Ready</u>
Cond. Sonde Type (YSI6820 or INW-CT2X)	<u>INW</u>	Last screen... <u>Prgrm Dis 1317</u>	<u>7 Mon Mar 2011</u>
Cond. Sonde Cal. Info.: Recorded Val. = <u>13.91</u> Meas. Val. = <u>NA</u> Diff. = <u>NA</u> (>10% adj. offset); Offset = <u>NA</u> New Rec Val = <u>NA</u>			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) <u>No cond. cal. Enable = 0.05 R, 20' L, 2000 C</u> <u>- Re-wired smplr Rpt cable w/ Isco cable</u>			

Section 3. Grab Sample Collection			
Personnel: <u>EM/JV</u>	Weather: <u>Stopped raining</u>	Arrival Date/Time: <u>3/8/11 0850</u>	
On Composite... (Bottle #/ Aliq #)	<u>Bottle 5/ 4,4</u>	Conductivity Reading (µS/cm):	<u>175 MS</u>
Grab Parameters Collected	<u>PC, TPH</u>	Salinity Reading (PPT):	<u>—</u>
Grab Sample ID	<u>PSNS032</u>	Temp. Reading (°C):	<u>—</u>
Grab Date/Time	<u>3/8/11 0850</u>	Turbidity Reading (NTU)	<u>12.2 NTU</u>
Grab Dup ID	<u>PSNS032-DUP</u>	Equipment running correctly?	<u>Y</u>
Grab Dup Date/Time	<u>3/8/11 0855</u>	Sampler Battery Voltage (Changed?):	<u>Good</u>
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?:			
Storm Controller notified (Y or N/A)?	<u>Y</u>	Grab MS/MSD Collected ? <u>Y</u> (N)	Ice OK? <u>Yes</u>
Notes: (what meter was used for site readings, etc.) <u>Same as comp. meter</u>			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 032 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel:	<u>DM / BR</u>	Weather:	<u>Raining, windy, 40°s</u>	Arrival Date/Time:	<u>3-9-11 (1125)</u>
Sampler Battery Voltage	<u>Good</u>	Changed?	<u>Y N</u>	<u>pulled</u>	New voltage <u>—</u>
Telemetry Battery Voltage	<u>+2+DM 12.5+</u>	Changed?	<u>Y N</u>	<u>—</u>	New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>NO</u>				
Additional Dup Grab (IDs, date/time)	<u>NO</u>				
Composite Begin Time (date/time)	<u>3-8-11 0435</u>	Sampler Report Downloaded ?	<u>Yes</u>		
Last Aliquot Taken (date/time, bott #, aliq #)	<u>3-8-11 (0904) BTL 5 3/4</u>				
Total Composite Sample Volume Collected	<u>~4720</u>				
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>4/4 BTL #5</u>				
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK</u>					
Storm Contoller notified (Y or N/A):	<u>(N/A)</u>	Which parameter?:	<u>NA</u>		
Notes: <u>Stopped sampling via telem. @ ~1320 3-8-11 because rain had stopped for several hrs. - Pipe lvl had returned to base flow</u>					
Maintenance Needed: <u>Reset tasks</u>					

Section 5. Compositing Scheme and QC Sampling

Personnel:	<u>DM / BR</u>	Date/Time:	<u>3-9-11 (1345)</u>
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.) <u>YSI 556 ser# 06J1594AC Turb = Hach 2100 P ser# 06070C018410</u>			
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smpl be included in comp smpl Y/N):			
1. 56 / 14 / Yes			
2. 56 / 17 / Yes			
3. 68 / 12 / Yes			
4. 63 / 13 / Yes			
5. 176 / 12 / Yes			
X			
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Used BTLs 1-5. No water collected beyond btl 5. Rain had stopped, hydrograph back to base flow</u>			
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>COND = 79 $\mu\text{S}/\text{cm}$ Turb = 15 NTU Vol. = ~4720 ml Analysis per PWP</u>			
Composite Sample ID & Time: <u>SW05-0008 (0904) 3-8-11</u>			
Field Blank Collected? (date/time)	<u>NO</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:

Possibly
STE #6

PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

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Station: PSNS032	MH/CB#: 5691	Loc. Descrip. NW corner B514
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pages per station

Section 1. Station Reset and Inspection

Personnel:	Weather:	Arrival Date/Time:	
Carry-over maintenance to do prior to set-up:			done?
Sampler Battery Voltage		Changed? Y N	New voltage
Modem Battery Voltage		Changed? Y N	New voltage
Sample Tubing & Strainer OK?		Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	
Trans. Cable OK?		Internal Sampler Tubing OK?	
Trans. Desiccant OK (Yes/No)		Tubing Replaced? (Yes/No)	
Telem. Box Desiccant OK (Yes/No)		Normal Smlpr Program or Dup. ?	
Modem Status		Bottles Loaded ?	
Notes (including channel condition): See previous set up form for PSNS032		Lid Status?	
		Backflushed with DI?	
		Suction line & quick connect attached?	
		Smlpr Status (on/off) / last screen..	

Section 2. Storm Setup and Inspection

Personnel:	Weather:	Arrival Date/Time:	
Sampler Battery Voltage		Changed? Y N	New voltage
Modem Battery Voltage		Changed? Y N	New voltage
Sample Tubing & Strainer OK?		Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	
Transducer Cable OK?		Aliquot Vol. Cal.'ed (Y/N & vol.)	
Multi-meter Cable OK		Program Reviewed (Yes/No), Dup ?	
Recorded Level (FT)		Lids off bottles?	
Measured Level (FT)		Diagnostics/Distributor arm check?	
Offset Diff (FT)		Backflush with DI?	
Level Adjusted ?		Storm Reset (1, enter) Completed	
Cond. Sonde Type (YSI6820 or INW-CT2X)		Last screen...	
Cond. Sonde Cal. Info. : Recorded Val. = Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val =			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.)			

Section 3. Grab Sample Collection

Personnel: EM/JY	Weather: Dry/sunny	Arrival Date/Time: 3/9/11 1305	
On Composite... (Bottle #/ Aliq #)	1, 4 Bottle 17	Conductivity Reading (µS/cm):	123 µS/cm
Grab Parameters Collected	TPH, FC	Salinity Reading (PPT):	—
Grab Sample ID (5006-0002)	PSNS032	Temp. Reading (°C):	11.62
Grab Date/Time	3/9/11 @ 1310	Turbidity Reading (NTU)	19
Grab Dup ID	NA	Equipment running correctly?	Yes
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	Good, no ▽
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: OK			
Storm Controller notified (Y or N/A)?:	NA	Grab MS/MSD Collected ? Y / (N)	Ice OK? OK
Notes: (what meter was used for site readings, etc.) "error occurred" error message			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSN-032 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>BZ/5Y</u>	Weather: <u>Light Rain</u>	Arrival Date/Time: <u>3/10/11 0815</u>	
Sampler Battery Voltage	<u>good</u>	Changed? <u>Y</u> <u>N</u> <u>pulled</u>	New voltage <u>—</u>
Telemetry Battery Voltage	<u>good</u>	Changed? <u>(Y)</u> <u>N</u>	New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>3-9-11 (0516)</u>	Sampler Report Downloaded?	<u>YES</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>Bottle</u>		
Total Composite Sample Volume Collected	<u>13 Full Bottles</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)			
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK - good - clean</u>			
Storm Controller notified (Y or N/A)?	<u>NA</u>	Which parameter?:	<u>NA</u> <u>NA</u>
Notes:			
Maintenance Needed: <u>Typical Resets</u>			

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>BZ/5Y</u>	Date/Time: <u>3-10-11 (0910)</u>		
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.) <u>COND = YSP 556</u> <u>Serial 06J1594AC</u> <u>Turb = Hach 2100P</u> <u>Serial 060706018410</u>			
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in μ S/cm; turb. reading in NTU; will ind. smpl be included in comp smpl Y/N):			
<u>10. 56/6 Yes</u>	<u>11. 169/36 Yes</u>	<u>22. 29/8 Yes</u>	<u>XX Bottles 10-15</u>
<u>11. 97/5 Yes</u>	<u>17. Empty</u>	<u>23. 30/4 Yes</u>	<u>1 hr each.</u>
<u>12. 44/13 Yes</u>	<u>18. Empty</u>	<u>24. 40/13 Yes</u>	<u>Bottles 16, 21, 24</u>
<u>13. 21/35 Yes</u>	<u>19. 15010/8 NO</u>		<u>2 hr each</u>
<u>14. 16/47 Yes</u>	<u>20. 29401/8 NO</u>		
<u>15. 18/25 Yes</u>	<u>21. 531/16 Yes</u>		
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>COND = 51</u> <u>Turb = 10.9</u> <u>VOL = ~ 800 mL</u> <u>Analysis per Pump</u>			
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>used Bottles 10, 15 & 16, 21, 22, 23 & 24</u> <u>used all of Bottles 16, 21, 22, 23 & 24</u> <u>used 500 mL's from 10-15</u>			
Composite Sample ID & Time: <u>SW06-0002 (0719) 0513</u>			
Field Blank Collected? (date/time)	<u>NO</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

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Station: PSNS096	MH/CB#: #3878	Loc. Descrip: SE of B457	Page: 1 of 1
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pages per station

Section 1. Station Reset and Inspection			
Personnel: DM/BR	Weather: high broken overcast, 40's	Arrival Date/Time: 3-7-11 (0850)	
Carry-over maintenance to do prior to set-up: Re-sets		done?	Y
Sampler Battery Voltage	12.70	Changed? Y (N)	New voltage 12.70
Modem Battery Voltage	12.76	Changed? Y (N)	New voltage 12.76
Sample Tubing & Strainer OK?	Y	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	+1 min
Transds. Cable OK?	Y	Internal Sampler Tubing OK?	Yes
Transds. Desiccant OK (Yes/No)	N-DM Y	Tubing Replaced? (Yes/No)	No
Telem. Box Desiccant OK (Yes/No)	N - changed	Normal Smplr Program or Dup. ?	Normal
Modem Status	Operational	Bottles Loaded ?	Yes
Notes (including channel condition): - trouble shot smplr comm cable • wires from pins B&C to G, other 2 as-is - cleaned & lub'd rain gauge		Lid Status?	Off
		Backflushed with DI?	Yes
		Suction line & quick connect attached?	Yes
		Smplr Status (on/off) / last screen..	See below

Section 2. Storm Setup and Inspection			
Personnel: DM/BR	Weather: same as above	Arrival Date/Time: 3-7-11 (0850)	
Sampler Battery Voltage	See above	Changed? Y N	New voltage
Modem Battery Voltage		Changed? Y N	New voltage
Sample Tubing & Strainer OK?	↓	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	+1 min
Transducer Cable OK?	Yes	Allquot Vol. Cal'ed (Y/N & vol.)	Yes - good 240-ml
Multi-meter Cable OK	Yes	Program Reviewed (Yes/No), Dup ?	Yes - normal
Recorded Level (FT)	9.71'	Lids off bottles?	Yes
Measured Level (FT)	9.83'	Diagnostics/Distributor arm check?	Yes
Offset Diff (FT)	0.12 new = 0.09'	Backflush with DI?	Yes
Level Adjusted ?	Yes	Storm Reset (1, enter) Completed	Yes - ready!
Cond. Sonde Type (YSI6820 or INW-CT2X)	YSI 6820	Last screen... Prgrm Dis. 1010	Mon 7 Mar...
Cond. Sonde Cal. Info. : Recorded Val. = 41589 Meas. Val. = NA Diff. = NA (>10% adj. offset); Offset = NA New Rec Val = NA			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) - No cal. on YSI cond. pacng = 15 repeats New Lvl offset = 0.09 enables = Lvl = 20', cond. = 2k rain = 0.05 NO			

Section 3. Grab Sample Collection			
Personnel: GM/JY	Weather: Dry/Sunny	Arrival Date/Time: 3/9/11 1335	
On Composite... (Bottle #/ Aliq #)	3 of 4, Bottle 12	Conductivity Reading (µS/cm):	219
Grab Parameters Collected	TPH, FC	Salinity Reading (PPT):	—
Grab Sample ID (SW05-0009)	PSNS096	Temp. Reading (°C):	13.69
Grab Date/Time	3/9/11 1340	Turbidity Reading (NTU)	20
Grab Dup ID	NA	Equipment running correctly?	Yes
Grab Dup Date/Time	NA	Sampler Battery Voltage (Changed?):	Good
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?: NA			
Storm Controller notified (Y or N/A)?:	NA	Grab MS/MSD Collected ? Y / N	Ice OK? NA
Notes: (what meter was used for site readings, etc.) Same meters as for comp. sample meas.			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 096 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>BR/SY</u>	Weather: <u>Light Rain</u>	Arrival Date/Time: <u>3-10-11 / 6:40</u>	
Sampler Battery Voltage	<u>good</u>	Changed? Y N <u>pulled</u>	New voltage <u>—</u>
Telemetry Battery Voltage	<u>good</u>	Changed? <u>(P)</u> N	New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>NA</u>		
Additional Dup Grab (IDs, date/time)	<u>NA</u>		
Composite Begin Time (date/time)	<u>3/9/11 (0827)</u>	Sampler Report Downloaded?	<u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>Bottle 23 @ 0111</u>		
Total Composite Sample Volume Collected	<u>24 full bottles / kept 10 bottles</u>		
Aliquots missed/NLD (date/time/bott #/aliq #)			
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>oil - good - clear</u>			
Storm Controller notified (Y or N/A)?	<u>NA</u>	Which parameter?	<u>NA</u>
Notes:			
Maintenance Needed: <u>Typical Resets</u>			

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>BR/SY</u>	Date/Time: <u>3-10-11 (0827)</u>		
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.) <u>Cond = YSI 556 Ser-A 0651594AL</u> <u>Turb = Hach 2100P Ser-A 060700018410</u>			
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in μ S/cm; turb. reading in NTU; will ind. smplr be included in comp smplr Y/N):			
<u>1. 711/8 / Yes</u>	<u>7 22705 / 7 / NO</u>	<u>13 404 / 17 / Yes^{NO}</u>	<u>19 33851 / 3 / NO</u>
<u>2. 30945 / 2 / NO</u>	<u>8 590 / 20 / Yes</u>	<u>14 30800 / 5 / NO</u>	<u>20 2100 / 12 / NO</u>
<u>3. 41212 / 1 / NO</u>	<u>9 336 / 23 / Yes</u>	<u>15 39510 / 1 / NO</u>	<u>21 350 / 1 / Yes</u>
<u>4 41692 / 1 / NO</u>	<u>10 122 / 31 / Yes</u>	<u>16 40595 / 1 / NO</u>	<u>22 294 / 7 / Yes</u>
<u>5 40541 / 1 / NO</u>	<u>11 231 / 23 / Yes</u>	<u>17 41020 / 1 / NO</u>	<u>23 275 / 6 / Yes</u>
<u>6 32350 / 1 / NO</u>	<u>12 200 / 14 / Yes^{NO}</u>	<u>18 41202 / 2 / NO</u>	<u>24 19851 / 2 / NO</u>
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Cond = 1605</u> <u>Turb = 175</u> <u>Vol = ~ 8000 mL</u> <u>Analysis per PWD</u>			
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>Center use Btl's 8, 9, 10, 11, 12, 13, 21, 22, 23 (10 bottles) ^{Analysis}</u> <u>Remove 13 bottles</u> <u>12 & 13 / they are Base pH</u>			
Composite Sample ID & Time: <u>SW05-00090010</u>			
Field Blank Collected? (date/time)	<u>NA</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:

PSNS NDDSW Monitoring Project Storm Control Work Sheet

Rev. 022511

Sheet __1__ of __1__

Date:	3/7/2011 and 3/8/2011			Sampling Support Personnel:	D. Metallo, B. Rupert									
STE #	5 and 6			Tidal Info:	3-8-11 (0640) 11.6' HH (1319) 1.3' LL / 03-09 (0123) HL 5.1', (0709) HH 11.3', (1356) LL 1.0', (2028) LH 10.3'									
Storm Controller:	D. Metallo			Grab sampling Info.	E. Mollerstuen, J. Young; will collect normal + Dup TPH									
Pre-Storm / Weather Details:	rain starting b/w 3-7 10pm and 3-8 4am (0.04" @ 45%), then b/w 4-10am (0.19" @ 85%), then 0.12" b/w 10am and 3-9 4am. B/w 4 and 10am (0.19" @ 95%), with an additional 0.68" @80-95% b/w 10am and 10pm.													
Telemetry Measurements:	DATE/TIME (24HR)													
	STE#5				STE#6									
STATION:	3-7-11 (2235)	3-8-11 (0708)	3-8-11 (1300)		3-8-11 (1400)	3-8-11 (2200)	3/9/2011 (0700)	1100	1300	2300	3/10/11 (0730)			
PSNS008 Rain	0	0.02 / 0.19	Storm End - stopped samplers via telemetry, rain had ceased and runoff returned to base flow levels.		Re-set samplers @ 015 and 032; 096 remains setup. Will use remaining btls in 015 and 032 to capture samples from next rain event (STE#6).	0	NA		NA	NA	NA	Stations 096 and 032 completed their sampling routines. 015 did not collect samples due to mis-setting on pacing reset switch.		
PSNS008 Level		2.58						NA		NA	NA		NA	
PSNS008 Cond.		2.7						NA		NA	NA		NA	
Smpl Marker	0	13					0	NA		NA	NA		NA	
PSNS015 Rain	0	0.01 / 0.2					0	0.33 / 0.30	pacing reset switch not config.ed	0.99 / 0.66	1.47 / 0.47		/ 0.21	
PSNS015 Level		8.11						7.71		0.61	5.81		8.39	
PSNS015 Cond.		29.73						35		127	9.5		58	
Smpl Marker	0	10					0	0		0	0		0	
PSNS032 Rain	0	0.01 / 0.16					0	0.31 / 0.27	increased pacing rate to 30 mins.	0.9 / 0.6	1.35 / 0.36		1.56 / 0.22	
PSNS032 Level		2.58						2.23		0.27	2.65		3.28	
PSNS032 Cond.		64						44		18	7		45	
Smpl Marker	0	11					0	7		27	47		60	
PSNS096 Rain	0	0.01 / 0.16					0	0.35 / 0.32		1.07 / 0.72	1.55 / 0.48		1.85 / 0.28	
PSNS096 Level		9.25						8.94		0.25	6.39		9.58	
PSNS096 Cond.		40828						40381		172	158		41016	
Smpl Marker	0	0					0	19		43	83		96	
Enabling Information:												Notes: * Prgm'ed to collect a duplicate comp sample @ PSNS008. * Navy to collect a duplicate TPH sample from a site TBD. * Telem comm established with all stations. * Smplr report function, through terminal emulator, works at all 4 stations. * STE#5 began @ (~0400) on 3-8. *Navy decided to end test around (1300) 3-8. * Reconfigured NBK samplers to be ready to sample the next strm evnt with the reamining bottles (15 ea) in each smpler. 096 didn't kickoff with 3-8 event, still armed and ready. 032 and 096 enabled during STE#6. 015 had pacing re-set issue - no smpls		
Sample Staion:	PSNS008		PSNS015		PSNS032		PSNS096							
Rain enable (in/hr)	0.03		0.03	0.03	0.03	0.03	0.03	0.03						
Level Enable (ft)	0.3		0.3	0.3	0.3	0.3	0.3	0.3						
Cond. (µS/cm)	2000		2000	2000	2000	2000	2000	2000						
Repeat. Cond Set ?	No		No	No	No	No	No	No						
Date	3/7/2011		3/7/2011	3/8/2011	3/7/2011	3/8/2011	3/7/2011	3/8/2011						
Time	2230		2230	2200	2230	2200	2230	2200						

SAMPLE CHAIN OF CUSTODY FORM

Date: 3-9-11

Page: 1 of 1

Project No.: N4523A10MP00034 Amend.1

Project: PSNSNon-dry Dock SW 2010

Battelle

Marine Sciences Laboratory

1529 West Sequim Bay Road


Laboratory: Battelle MSL


Attention: Jill Brandenberger

Phone: (360) 681-4564

Analyze parameters per QAP/FSP

Sample Label	Station ID	Collection Date/Time	Matrix	Hardness	TOC	DOC	TSS	TME/DME	TPH	Turbidity					No. containers	Sample Type (Grab vs. Comp)	Storm#	Notes
SW05-0001	PSNS 008	3-8-11 (0829)	SW						X						2	Grab	5	
SW05-0002	PSNS 015	3-8-11 (0934)	SW						X						2	Grab	5	
SW05-0003	PSNS 032	3-8-11 (0852)	SW						X						2	Grab	5	
SW05-0004	PSNS 032 DUP	3-8-11 (0855)	SW						X						2	Grab	5	DUP of 032
SW05-0005	PSNS 008	3-8-11 (0855)	SW	X	X	X	X	X							1	Comp	5	Cond=36 Turb=
SW05-0006	PSNS 008 DUP	3-8-11 (0855)	SW	X	X	X	X	X							1	Comp	5	Cond=37 Turb=29
SW05-0007	PSNS 015	3-8-11 (1139)	SW	X	X	X	X	X							1	Comp	5	Cond=374 Turb=23
SW05-0008	PSNS 032	3-8-11 (0904)	SW	X	X	X	X	X							1	Comp	5	Cond=79 Turb=15

Relinquished by:  3/9/11 1605
 Signature Date Time
 Brian Ruppert TEC
 Printed Name Company

Received by:  3/9/11 1610
 Signature Date Time
 Brenda Lasorsa
 Printed Name

Total # of Containers:
 Shipment Method:
 Hand deliver TEC to PNNL
 Sample Disposition:

Relinquished by:
 Signature Date Time
 Printed Name Company

Received by:
 Signature
 Printed Name

Distribution:
 1) PNNL
 2) CAS
 3) JAT TEC JMB 3/11/11

30
 DUP of 008

Date: _____
Page: 1 of 1
Project No.: N4523A10MP00034 Amend.1
Project: PSNSNon-dry Dock SW 2010

Marine Sciences Laboratory
1529 West Sequim Bay Road
Laboratory: Battelle MSL
Attention: Jill Brandenberger
Phone: (360) 681-4564

[illegible]

PSNS NDDSW Monitoring
Stormwater Outfall Total Discharge Volume Estimation Equations

PSNS Drainage Basin	Total Basin Area (ft ²)	Type of Surface	Percentage of Drainage Basin Surface Type	Area of Basin Surface Type (ft ²)	¹ Runoff Coefficient Range	Area of Basin Surface Type with Maximum Coefficient Value Applied (ft ²)	² Total Discharge Volume (ft ³)
032	208,653	Impervious	97	202,393	0.6 – 0.9	182,154	R(184,658)
		Pervious	3	6,260	0.2 – 0.4	2,504	
015	4,018,862	Impervious	50	2,009,431	0.5 – 0.8	1,607,549	R(2,411,321)
		Pervious	50	2,009,431	0.25 – 0.4	803,772	
008	553,650	Impervious	94	520,431	0.5 – 0.8	416,349	R(429,637)
		Pervious	6	33,219	0.2 – 0.4	13,288	

Calculation Worksheet:	STE#5 3/8/2011
-------------------------------	-----------------------

STATION	Combined Drainage Area (FT ²)	ENTER: STE Rain Total (in)	STE Rain Total (FT)	STE Runoff Vol. (gal)	ENTER: Smpl Evnt Rain Total (in)	Sampl Evnt Rain Total (FT)	Sample Event Runoff Vol. (gal)
032	184,658	0.17	0.0142	19,568.95	0.12	0.0100	13,813.38
015	2,411,321	0.17	0.0142	255,537.38	0.08	0.0067	120,252.88
008	429,637	0.19	0.0158	50,886.87	0.15	0.0125	40,173.85

PSNS NDDSW Monitoring
Stormwater Outfall Total Discharge Volume Estimation Equations

PSNS Drainage Basin	Total Basin Area (ft ²)	Type of Surface	Percentage of Drainage Basin Surface Type	Area of Basin Surface Type (ft ²)	¹ Runoff Coefficient Range	Area of Basin Surface Type with Maximum Coefficient Value Applied (ft ²)	² Total Discharge Volume (ft ³)
096	717,872	Impervious	97	696,336	0.6 – 0.9	626,702	R(635,317)
		Pervious	3	21,536	0.2 – 0.4	8,615	
032	208,653	Impervious	97	202,393	0.6 – 0.9	182,154	R(184,658)
		Pervious	3	6,260	0.2 – 0.4	2,504	
015	4,018,862	Impervious	50	2,009,431	0.5 – 0.8	1,607,549	R(2,411,321)
		Pervious	50	2,009,431	0.25 – 0.4	803,772	

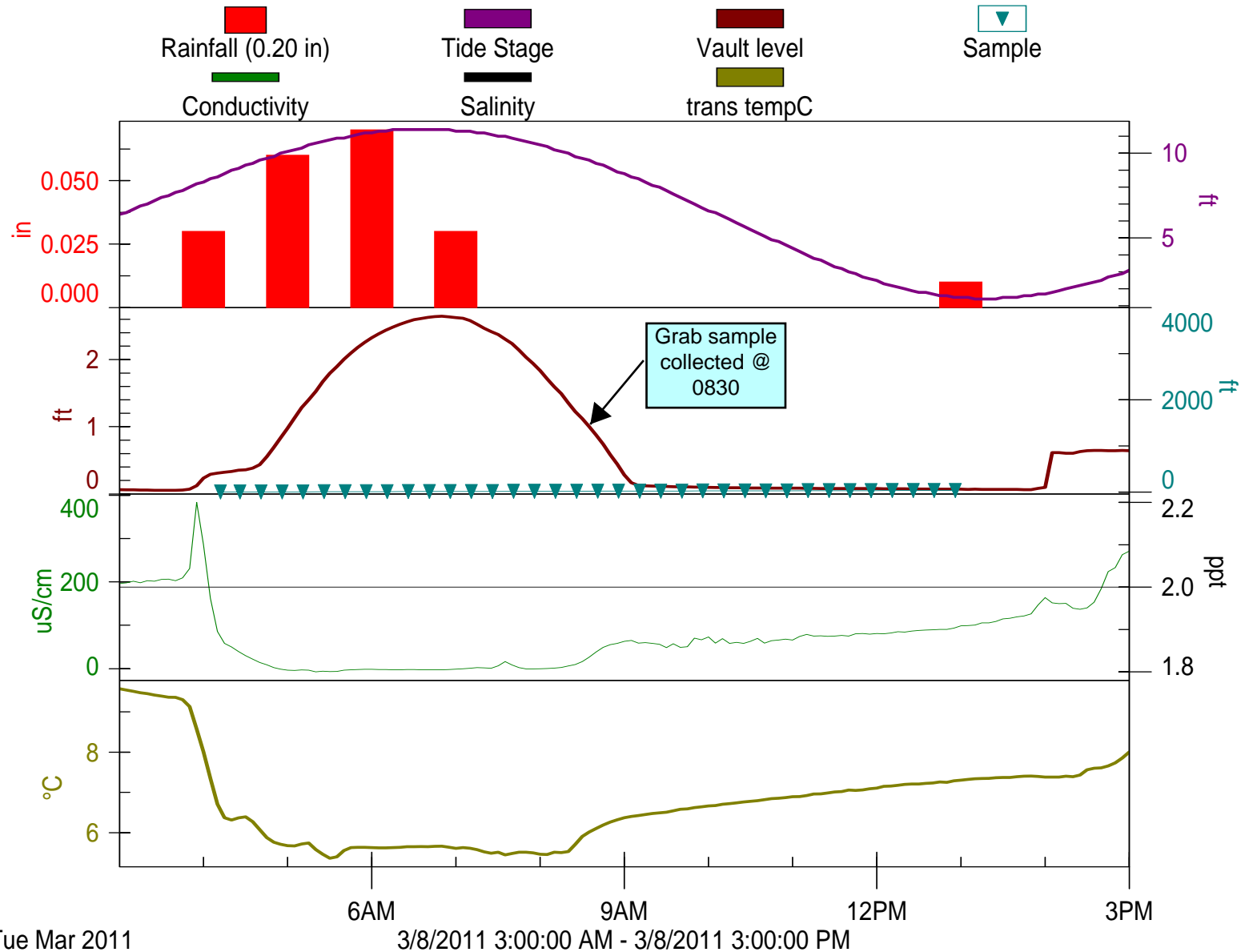
Calculation Worksheet:

STE#6 3/9/2011

STATION	Combined Drainage Area (FT ²)	ENTER: STE Rain Total (in)	STE Rain Total (FT)	STE Runoff Vol. (gal)	ENTER: Smpl Evnt Rain Total (in)	Sampl Evnt Rain Total (FT)	Sample Event Runoff Vol. (gal)
096	635,317	2.39	0.1992	946,539.76	1.78	0.1483	704,954.30
032	184,658	2.05	0.1708	235,978.52	1.56	0.1300	179,573.90
015	2,411,321	2.21	0.1842	3,321,985.91	0.00	0.0000	0.00

PSNS 008

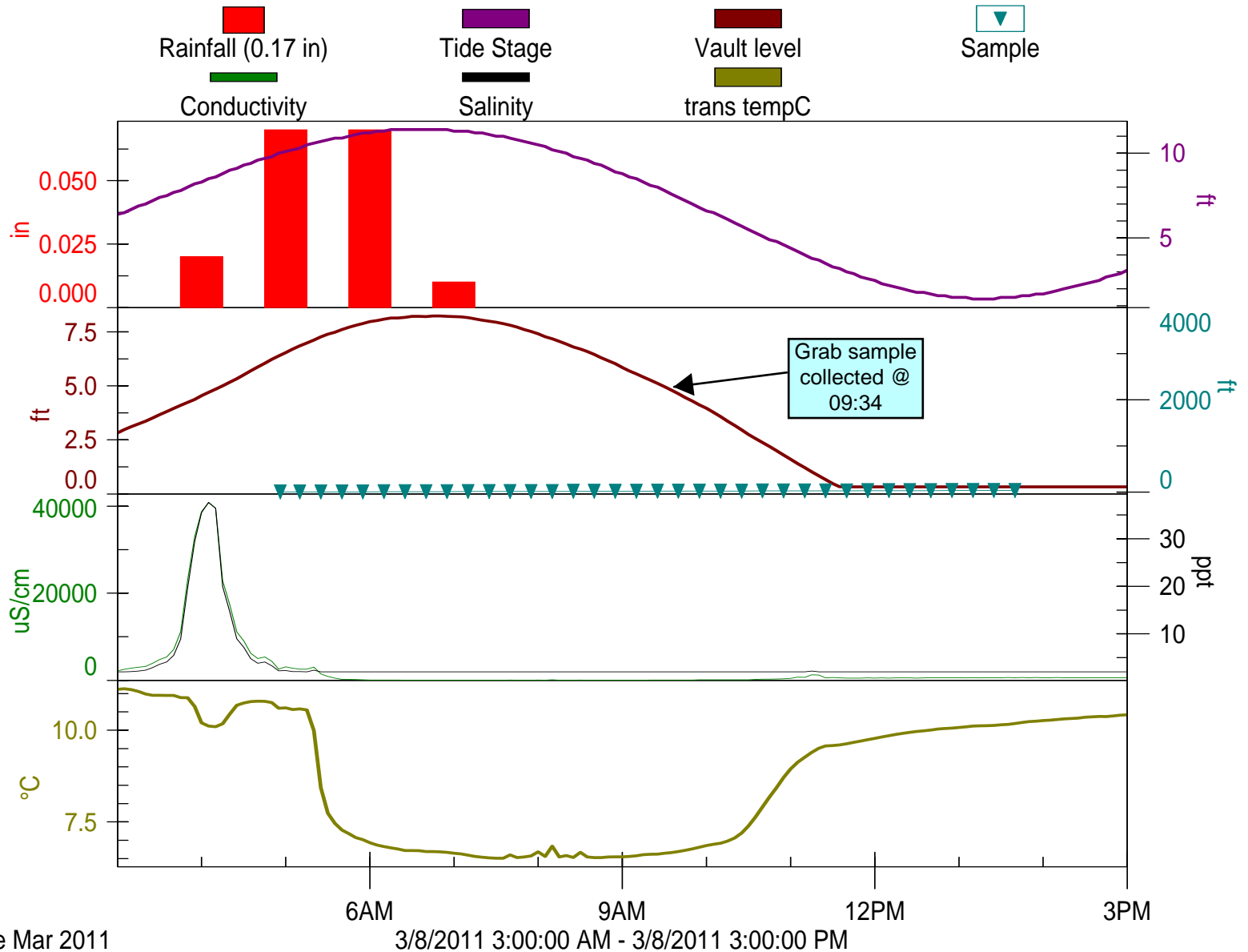
STE#5 3-8-2011



8 Tue Mar 2011

PSNS 015

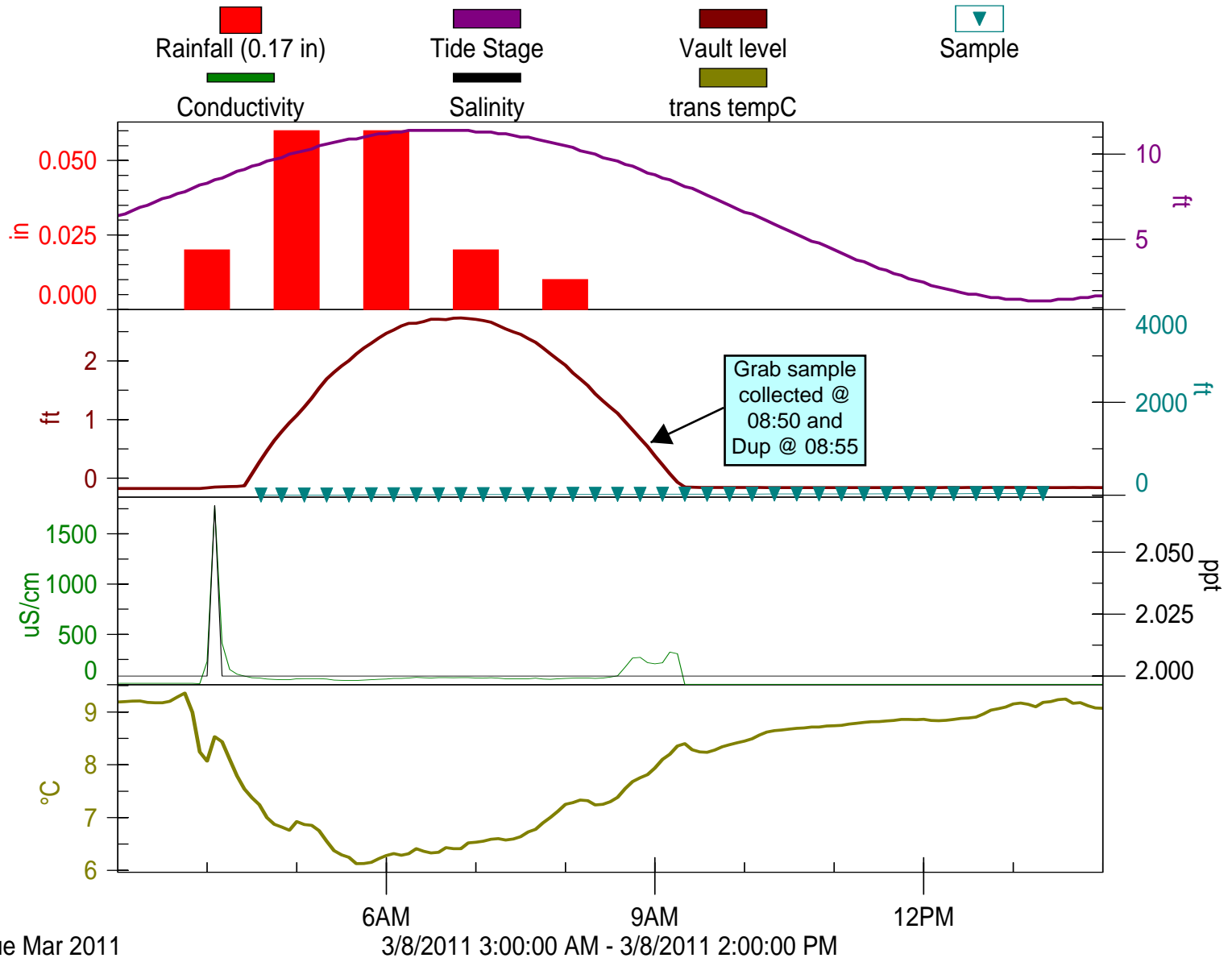
STE#5 3-8-2011



8 Tue Mar 2011

PSNS 032

STE#5 3-8-2011



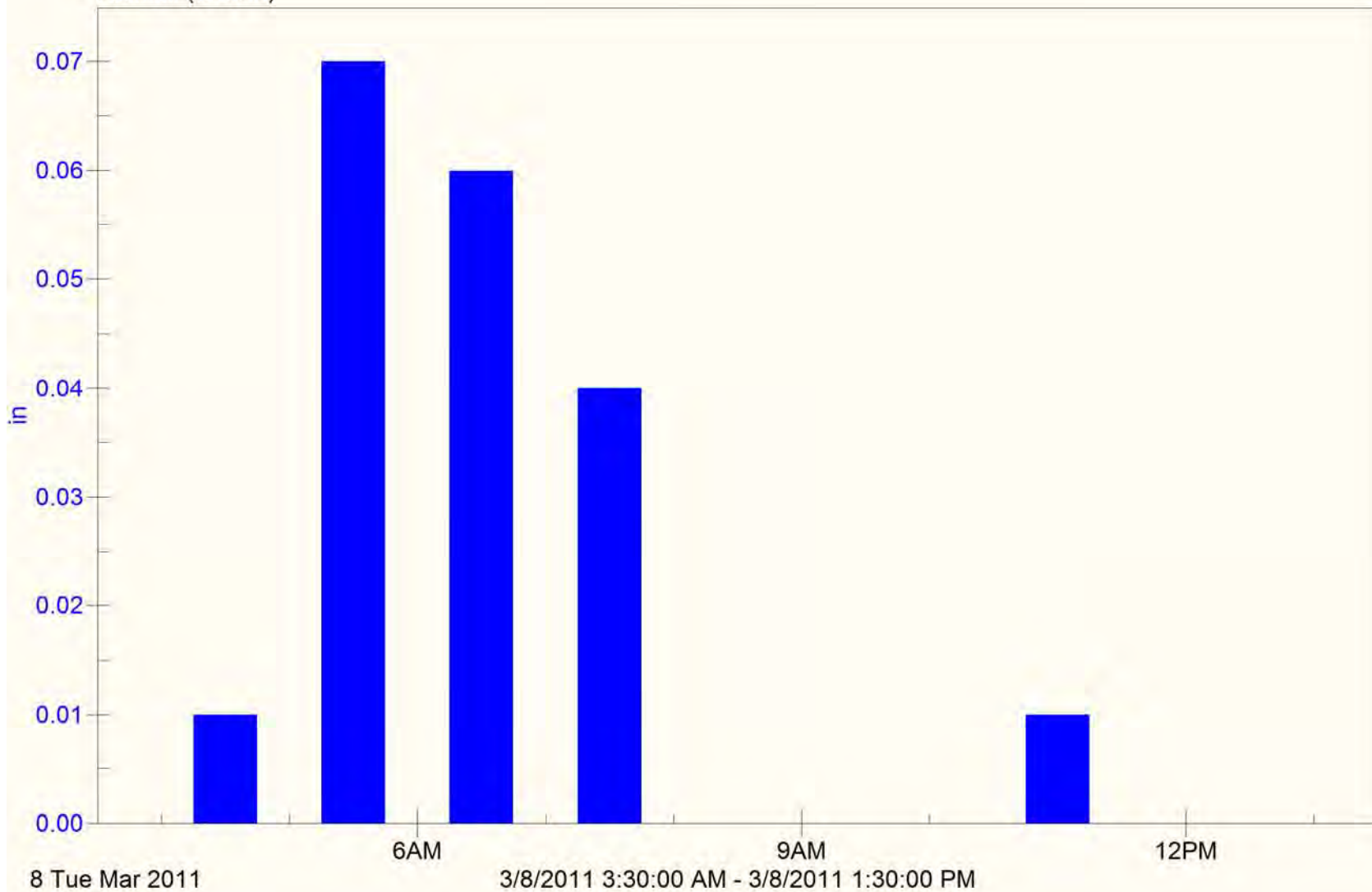
8 Tue Mar 2011

PSNS B427 Rain

STE#5 3-8-11



Rainfall (0.19 in)



PSNS 032
STE#6 3-9-2011

Rainfall (2.05 in)

Tide Stage

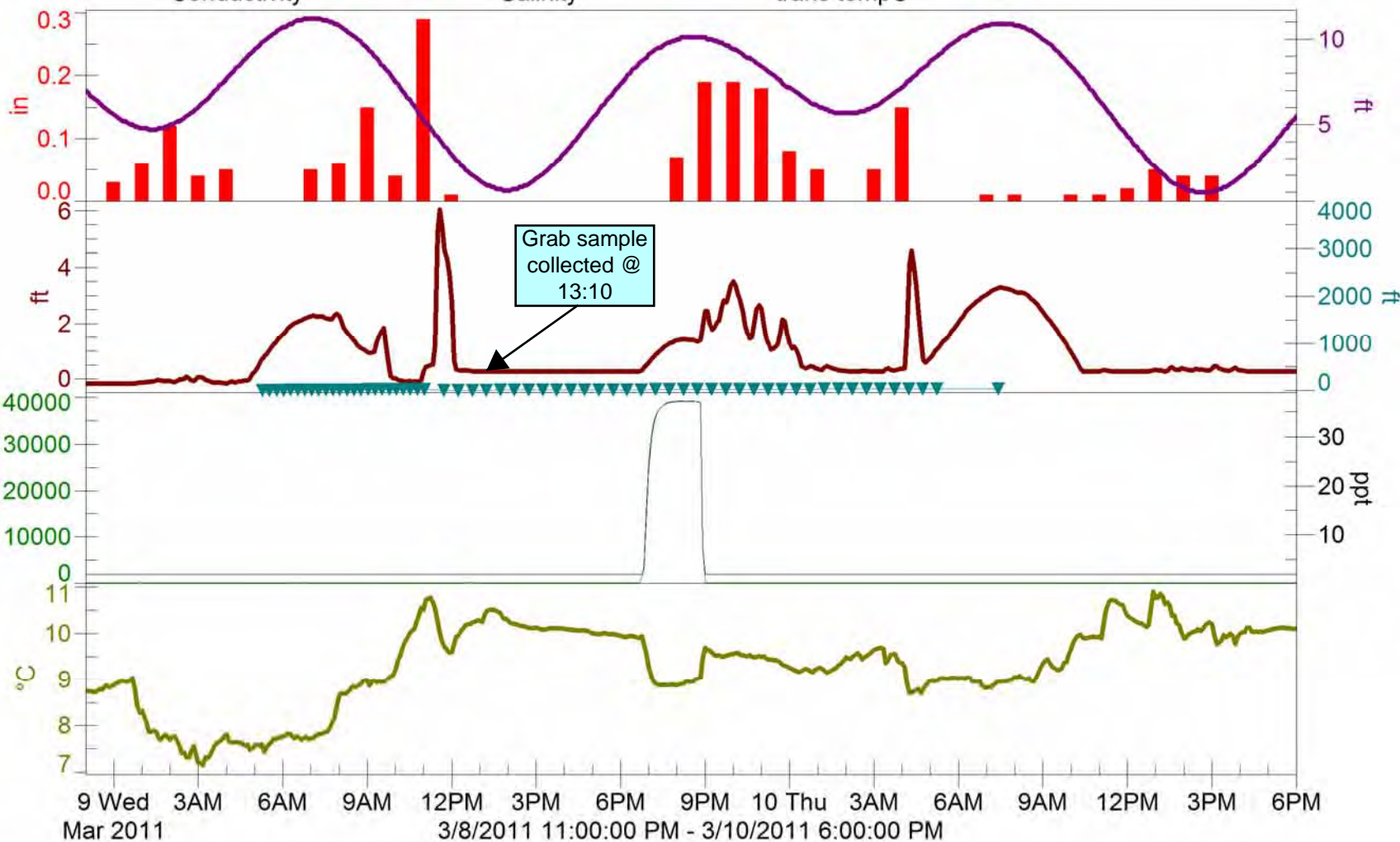
Vault level

Sample

Conductivity

Salinity

trans tempC



PSNS 096
STE#6 3-9-2011

Rainfall (2.39 in)

Tide Stage

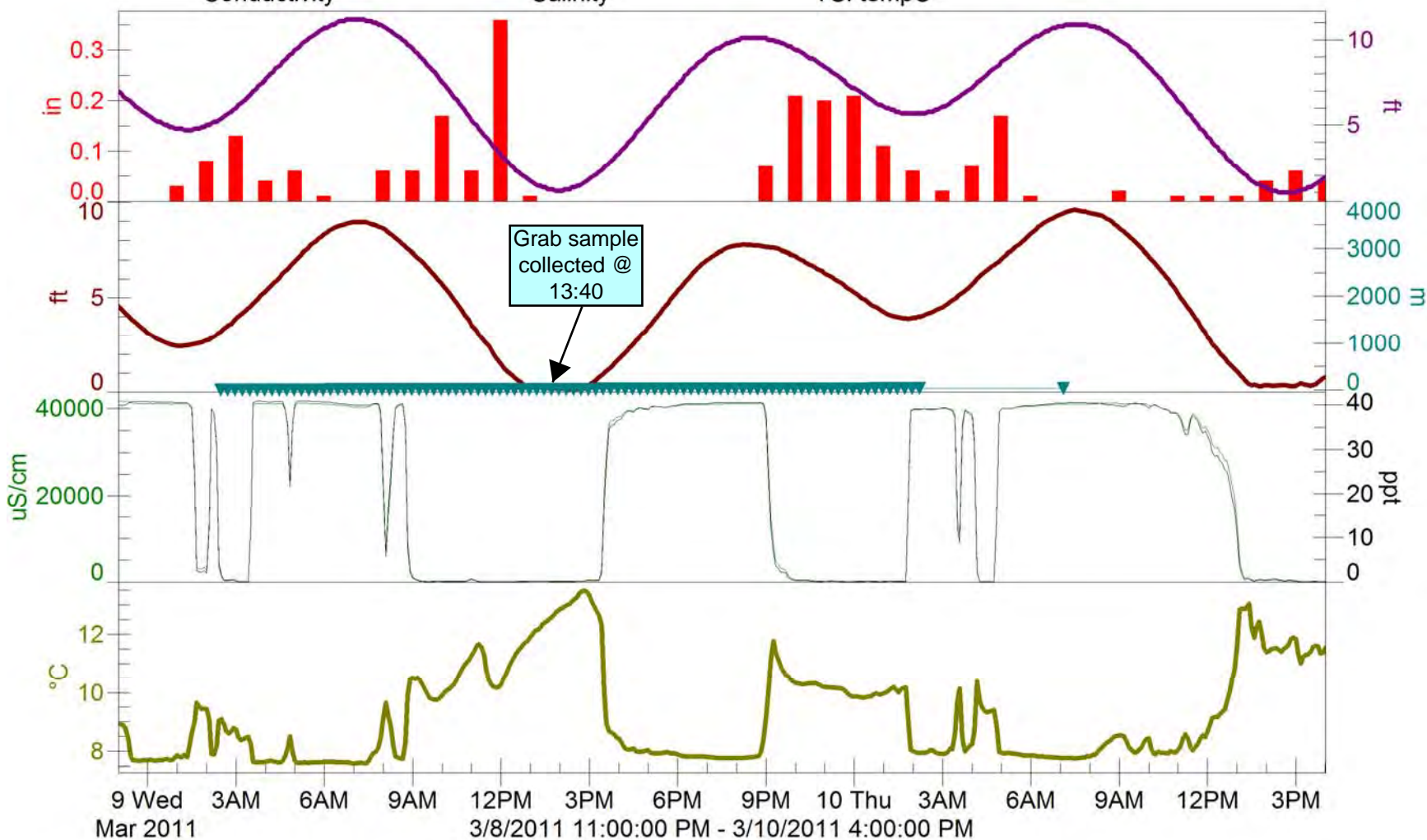
Vault level

Sample

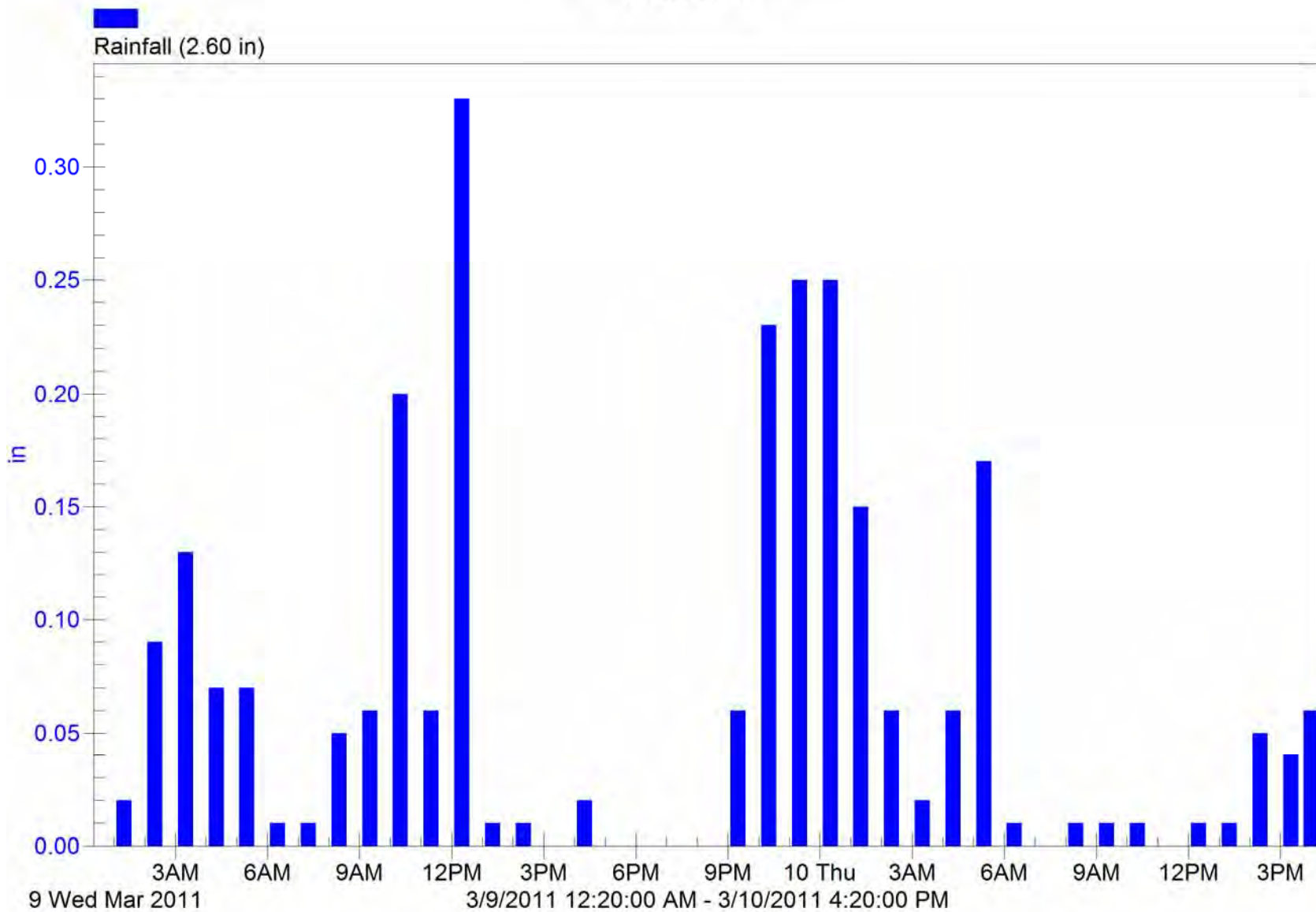
Conductivity

Salinity

YSI tempC



STE#6 3-9-11



008 STE#5 smpl r rpt
SAMPLER ID# 3293179321 13:23 8-MAR-11
Hardware: B2 Software: 3.26
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"PSNS008DUP"
SITE DESCRIPTION:
"PSNS008DUP"

UNITS SELECTED:
LENGTH: ft

24, 1000 ml BTLS
16 ft SUCTION LINE
10 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
2 BOTTLES/SAMPLE
8 SAMPLES/BOTTLE

VOLUME:

120 ml SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON
NO RAIN GAGE

NO YSI SONDE

 MASTER/SLAVE OFF
 BTL FULL DETECT OFF
 TIMED BACKLIGHT

 EVENT MARK SENT
 DURING PUMP CYCLE

 PUMP COUNTS FOR
 EACH PURGE CYCLE:
 200 PRE-SAMPLE
 AUTO POST-SAMPLE

 I /01= NONE
 I /02= NONE
 I /03= NONE

 0 ANALOG OUTPUTS

NO PERIODIC
 SERIAL OUTPUT

NO DI ALOUT
 CONDI TIONS SET

SAMPLER ID# 3293179321 13:23 8-MAR-11
 Hardware: B2 Software: 3.26
 ***** SAMPLING RESULTS *****

SITE: PSNS008DUP
 PROGRAM: PSNS008DUP
 Program Started at 12:12 MO 7-MAR-11
 Nominal Sample Volume = 120 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	LIQUID	COUNT
						TO
-----						-----
12:12 PGM DISABLED						
TU 08-MAR-11						-----
04:11 PGM ENABLED						
1,8	1-2	04:11	E			398
2,8	1-2	04:25	F			401
3,8	1-2	04:40	F			401
4,8	1-2	04:55	F			401
5,8	1-2	05:10	F			397
6,8	1-2	05:25	F			395
7,8	1-2	05:40	F			393
8,8	1-2	05:55	F			392
1,8	3-4	06:10	F			392
2,8	3-4	06:25	F			390
3,8	3-4	06:40	F			390
4,8	3-4	06:55	F			390
5,8	3-4	07:10	F			391
6,8	3-4	07:25	F			395
7,8	3-4	07:40	F			396
8,8	3-4	07:55	F			401

				008 STE#5	smpl r rpt
1, 8	5-6	08: 10	F		398
2, 8	5-6	08: 25	F		401
3, 8	5-6	08: 40	F		401
4, 8	5-6	08: 55	F		401
5, 8	5-6	09: 10	F	NL	*
6, 8	5-6	09: 25	F	NL	*
7, 8	5-6	09: 40	F	NL	*
8, 8	5-6	09: 55	F	NL	*
1, 8	7-8	10: 10	F	NL	*
2, 8	7-8	10: 25	F	NL	*
3, 8	7-8	10: 40	F	NL	*
4, 8	7-8	10: 55	F	NL	*
5, 8	7-8	11: 10	F	NL	*
6, 8	7-8	11: 25	F	NL	*
7, 8	7-8	11: 40	F	NL	*
8, 8	7-8	11: 55	F	NL	*
1, 4	9-10	12: 10	F	NL	*
2, 4	9-10	12: 25	F	NL	*
3, 4	9-10	12: 40	F	NL	*
4, 4	9-10	12: 55	F	NL	*

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW
 ERROR NL ==> NO LIQUID DETECTED!

015 STE#5 smpl r rpt
SAMPLER ID# 2425481222 16:20 8-MAR-11
Hardware: B2 Software: 3.26
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"PSNS015"
SITE DESCRIPTION:
"PSNS015"

UNITS SELECTED:
LENGTH: ft

24, 1000 ml BTLS
22 ft SUCTION LINE
18 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 ml SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

 MASTER/SLAVE OFF
 BTL FULL DETECT OFF
 TIMED BACKLIGHT

 EVENT MARK SENT
 DURING PUMP CYCLE

 PUMP COUNTS FOR
 EACH PURGE CYCLE:
 200 PRE-SAMPLE
 AUTO POST-SAMPLE

 I /01= NONE
 I /02= NONE
 I /03= NONE

 0 ANALOG OUTPUTS

NO PERIODIC
 SERIAL OUTPUT

NO DIALOUT
 CONDITIONS SET

 SAMPLER ID# 2425481222 13:43 8-MAR-11
 Hardware: B2 Software: 3.26
 ***** SAMPLING RESULTS *****

SITE: PSNS015
 PROGRAM: PSNS015
 Program Started at 10:48 MO 7-MAR-11
 Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	LIQUID
					COUNT TO
-----					-----
10:48 PGM DISABLED					
TU 08-MAR-11					-----
04:55 PGM ENABLED					
1,4	1	04:55	E		720
2,4	1	05:09	F		713
3,4	1	05:24	F		715
4,4	1	05:39	F		715
1,4	2	05:54	F		714
2,4	2	06:09	F		709
3,4	2	06:24	F		706
4,4	2	06:39	F		709
1,4	3	06:54	F		707
2,4	3	07:09	F		708
3,4	3	07:24	F		712
4,4	3	07:39	F		718
1,4	4	07:54	F		720
2,4	4	08:09	F		718
3,4	4	08:24	F		721

				015 STE#5 smpl r rpt
4, 4	4	08: 39	F	730
1, 4	5	08: 54	F	732
2, 4	5	09: 09	F	739
3, 4	5	09: 24	F	750
4, 4	5	09: 39	F	751
1, 4	6	09: 54	F	757
2, 4	6	10: 09	F	762
3, 4	6	10: 24	F	781
4, 4	6	10: 39	F	781
1, 4	7	10: 54	F	796
2, 4	7	11: 09	F	805
3, 4	7	11: 24	F	816
4, 4	7	11: 39	F	834
1, 4	8	11: 54	F	834
2, 4	8	12: 09	F	840
3, 4	8	12: 24	F	840
4, 4	8	12: 39	F	841
1, 4	9	12: 54	F	846
2, 4	9	13: 09	F	846
3, 4	9	13: 24	F	846
4, 4	9	13: 39	F	852

SOURCE E ==> ENABLE

SOURCE F ==> FLOW

032 STE#5 smpl r rpt
SAMPLER ID# 2483481595 15:53 8-MAR-11
Hardware: B2 Software: 3.21
***** PROGRAM SETTINGS *****

PROGRAM NAME:
"PSNS032"
SITE DESCRIPTION:
"PSNS032"

UNITS SELECTED:
LENGTH: ft

24, 1000 ml BTLS
23 ft SUCTION LINE
12 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 ml SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON
NO RAIN GAGE

 NO YSI SONDE

 MASTER/SLAVE OFF
 BTL FULL DETECT OFF
 TIMED BACKLIGHT

 EVENT MARK SENT
 DURING PUMP CYCLE

 PUMP COUNTS FOR
 EACH PURGE CYCLE:
 200 PRE-SAMPLE
 AUTO POST-SAMPLE

 I /01= NONE
 I /02= NONE
 I /03= NONE

 0 ANALOG OUTPUTS

NO PERIODIC
 SERIAL OUTPUT

 NO DIALOUT
 CONDITIONS SET

 SAMPLER ID# 2483481595 15:53 8-MAR-11
 Hardware: B2 Software: 3.21
 ***** SAMPLING RESULTS *****
 SITE: PSNS032
 PROGRAM: PSNS032
 Program Started at 13:17 MO 7-MAR-11
 Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	COUNT TO ERROR LIQUID
-----	-----	-----	---	-----
		13:17	PGM DISABLED	
		TU 08-MAR-11		
		04:35	PGM ENABLED	
1,4	1	04:35	E	645
2,4	1	04:49	F	632
3,4	1	05:04	F	634
4,4	1	05:19	F	632
1,4	2	05:34	F	628
2,4	2	05:49	F	628
3,4	2	06:04	F	628
4,4	2	06:19	F	623
1,4	3	06:34	F	623
2,4	3	06:49	F	625
3,4	3	07:04	F	619
4,4	3	07:19	F	627

					032 STE#5	sml r rpt
1, 4	4	07: 34	F		627	
2, 4	4	07: 49	F		639	
3, 4	4	08: 04	F		627	
4, 4	4	08: 19	F		638	
1, 4	5	08: 34	F		639	
2, 4	5	08: 49	F		644	
3, 4	5	09: 04	F		646	
4, 4	5	09: 19	F	NL	*	
1, 4	6	09: 34	F	NL	*	
2, 4	6	09: 49	F	NL	*	
3, 4	6	10: 04	F	NL	*	
4, 4	6	10: 19	F	NL	*	
1, 4	7	10: 34	F	NL	*	
2, 4	7	10: 49	F	NL	*	
3, 4	7	11: 04	F	NL	*	
4, 4	7	11: 19	F	NL	*	
1, 4	8	11: 34	F	NL	*	
2, 4	8	11: 49	F	NL	*	
3, 4	8	12: 04	F	NL	*	
4, 4	8	12: 19	F	NL	*	
1, 4	9	12: 34	F	NL	*	
2, 4	9	12: 49	F	NL	*	
3, 4	9	13: 04	F	NL	*	
4, 4	9	13: 19	F	NL	*	

SOURCE E ==> ENABLE
SOURCE F ==> FLOW
ERROR NL ==> NO LIQUID DETECTED!

SAMPLER ID# 2483481595 15: 53 8-MAR-11 Hardware: B2 Software: 3. 21
MODULE: NONE
Hardware: Software: 0. 00
***** COMBINED RESULTS *****
SITE: PSNS032
PROGRAM: PSNS032
Program Started at 13: 17 MO 7-MAR-11
Nominal Sample Volume = 240 ml

MODULE: NONE

SAMPLER ID# 2483481595 15: 53 8-MAR-11
Hardware: B2 Software: 3. 21
***** COMBINED RESULTS *****
SITE: PSNS032
PROGRAM: PSNS032
Program Started at 13: 17 MO 7-MAR-11
Nominal Sample Volume = 240 ml

SAMPLE BOTTLE TIME FR-TEMP
C

NO FR-TEMPERATURE

STE#6 smplr Rpt 032

*** Model 6700 HW Rev: B2 SW Rev: 3.21.0000 ID 2483481595

> REPORT

SAMPLER ID# 2483481595 06:20 10-MAR-11

Hardware: B2 Software: 3.21

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS032"

SITE DESCRIPTION:

"PSNS032"

UNITS SELECTED:

LENGTH: ft

24, 1000 ml BTLS
23 ft SUCTION LINE
12 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 ml SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF

BTL FULL DETECT OFF

TIMED BACKLIGHT

EVENT MARK SENT

DURING PUMP CYCLE

PUMP COUNTS FOR

EACH PURGE CYCLE:

200 PRE-SAMPLE

AUTO POST-SAMPLE

 I /01= NONE
 I /02= NONE
 I /03= NONE

0 ANALOG OUTPUTS
 NO PERIODIC
 SERIAL OUTPUT

NO DIALOUT
 CONDITIONS SET

SAMPLER ID# 2483481595 06:21 10-MAR-11
 Hardware: B2 Software: 3.21
 ***** SAMPLING RESULTS *****
 SITE: PSNS032
 PROGRAM: PSNS032
 Program Started at 13:17 MO 7-MAR-11
 Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	LIQUID	COUNT TO
-----	-----	-----	---	---	-----	-----
		13:17	PGM	DI SABLED		
-----		TU 08-MAR-11	-----			
		04:35	PGM	ENABLED		

----- WE 09-MAR-11 -----
 ++Started at BTL10, previous 1-9 used for 3-7-11 event++

1,4	10	05:16	F		642
2,4	10	05:31	F		634
3,4	10	05:46	F		632
4,4	10	06:01	F		628
1,4	11	06:16	F		635
2,4	11	06:31	F		626
3,4	11	06:46	F		627
4,4	11	07:01	F		627
1,4	12	07:16	F		627
2,4	12	07:31	F		632
3,4	12	07:46	F		629
4,4	12	08:01	F		631
1,4	13	08:16	F		635
2,4	13	08:31	F		642
3,4	13	08:46	F		641
4,4	13	09:01	F		647
1,4	14	09:16	F		642
2,4	14	09:31	F		632
3,4	14	09:46	F		652
4,4	14	10:01	F		659
1,4	15	10:16	F		664
2,4	15	10:31	F		659
3,4	15	10:46	F		660
4,4	15	11:01	F		659
++Changed pacing rate to 30 minutes++					
1,4	16	11:43	F		620
2,4	16	12:13	F		676
3,4	16	12:43	F	NM	*
4,4	16	13:13	F	NM	*
1,4	17	13:43	F	NL	*
2,4	17	14:13	F	NL	*
3,4	17	14:43	F	NL	*
4,4	17	15:13	F	NL	*

STE#6 smpl r Rpt 032

1, 4	18	15: 43	F	NL	*
2, 4	18	16: 13	F	NL	*
3, 4	18	16: 43	F	NL	*
4, 4	18	17: 13	F	NL	*
1, 4	19	17: 43	F	NL	*
2, 4	19	18: 13	F	NL	*
3, 4	19	18: 43	F		662
4, 4	19	19: 13	F		658
1, 4	20	19: 43	F		640
2, 4	20	20: 13	F		641
3, 4	20	20: 43	F		640
4, 4	20	21: 13	F		634
1, 4	21	21: 43	F		623
2, 4	21	22: 13	F		622
3, 4	21	22: 43	F		629
4, 4	21	23: 13	F		639
1, 4	22	23: 43	F		633
----- TH 10-MAR-11 -----					
2, 4	22	00: 13	F		646
3, 4	22	00: 43	F		653
4, 4	22	01: 13	F		655
1, 4	23	01: 43	F		664
2, 4	23	02: 13	F	NM	*
3, 4	23	02: 43	F		723
4, 4	23	03: 13	F	NM	*
1, 4	24	03: 43	F		664
2, 4	24	04: 13	F		620
3, 4	24	04: 43	F		641
4, 4	24	05: 13	F		639
05: 14 PGM DONE 10-MAR					
SOURCE E ==> ENABLE					
SOURCE F ==> FLOW					
ERROR NL ==> NO LI QUI D DETECTED!					
ERROR NM ==> NO MORE LI QUI D!					

SAMPLER ID# 2483481595 06: 21 10-MAR-11

Hardware: B2 Software: 3. 21

MODULE: NONE

Hardware: Software: 0. 00

***** COMBI NED RESULTS *****

SITE: PSNS032

PROGRAM: PSNS032

Program Started at 13: 17 MO 7-MAR-11

Nomi nal Sampl e Vol ume = 240 ml

MODULE: NONE

SAMPLER ID# 2483481595 06: 21 10-MAR-11

Hardware: B2 Software: 3. 21

***** COMBI NED RESULTS *****

SITE: PSNS032

PROGRAM: PSNS032

Program Started at 13: 17 MO 7-MAR-11

Nomi nal Sampl e Vol ume = 240 ml

FR-TEMP

SAMPLE BOTTLE TIME C

NO FR-TEMPERATURE

STE#6 Smplr Rpt 096

*** Model 6700 HW Rev: B2 SW Rev: 3.26.0000 ID 3293179316

>

*** Model 6700 HW Rev: B2 SW Rev: 3.26.0000 ID 3293179316

> REPORT

SAMPLER ID# 3293179316 06:11 10-MAR-11

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS096"

SITE DESCRIPTION:

"PSNS096"

UNITS SELECTED:

LENGTH: ft

24, 1000 ml BTLS
22 ft SUCTION LINE
18 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:

FLOW, EVERY

1 PULSES

SAMPLE AT START

DISTRIBUTION:

4 SAMPLES/BOTTLE

VOLUME:

240 ml SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:

ONCE ENABLED,

STAY ENABLED

SAMPLE AT ENABLE

ENABLE:

0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF

BTL FULL DETECT OFF

TIMED BACKLIGHT

EVENT MARK SENT

DURING PUMP CYCLE

PUMP COUNTS FOR

EACH PURGE CYCLE:
 200 PRE-SAMPLE
 AUTO POST-SAMPLE

 I /01= NONE
 I /02= NONE
 I /03= NONE

O ANALOG OUTPUTS
 NO PERIODIC
 SERIAL OUTPUT

NO DIALOUT
 CONDITIONS SET

 SAMPLER ID# 3293179316 06:11 10-MAR-11
 Hardware: B2 Software: 3.26
 ***** SAMPLING RESULTS *****

SITE: PSNS096
 PROGRAM: PSNS096
 Program Started at 10:09 MO 7-MAR-11
 Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE ERROR	COUNT TO LIQUID
-----	-----	-----	-----	-----
		10:09	PGM DI SABLED	
		WE 09-MAR-11		
		02:27	PGM ENABLED	
1,4	1	02:27	E	665
2,4	1	02:41	F	661
3,4	1	02:56	F	661
4,4	1	03:11	F	661
1,4	2	03:26	F	656
2,4	2	03:41	F	654
3,4	2	03:56	F	655
4,4	2	04:11	F	649
1,4	3	04:26	F	647
2,4	3	04:41	F	641
3,4	3	04:56	F	638
4,4	3	05:11	F	637
1,4	4	05:26	F	633
2,4	4	05:41	F	629
3,4	4	05:56	F	626
4,4	4	06:11	F	625
1,4	5	06:26	F	626
2,4	5	06:41	F	625
3,4	5	06:56	F	625
4,4	5	07:11	F	625
1,4	6	07:26	F	625
2,4	6	07:41	F	625
3,4	6	07:56	F	625
4,4	6	08:11	F	626
1,4	7	08:26	F	632
2,4	7	08:41	F	631
3,4	7	08:56	F	631
4,4	7	09:11	F	636
1,4	8	09:26	F	641
2,4	8	09:41	F	639
3,4	8	09:56	F	647
4,4	8	10:11	F	650
1,4	9	10:26	F	656
2,4	9	10:41	F	662

STE#6 Smpl r Rpt 096

3, 4	9	10: 56	F	672
4, 4	9	11: 11	F	679
1, 4	10	11: 26	F	685
2, 4	10	11: 41	F	692
3, 4	10	11: 56	F	701
4, 4	10	12: 11	F	699
1, 4	11	12: 26	F	708
2, 4	11	12: 41	F	710
3, 4	11	12: 56	F	716
4, 4	11	13: 11	F	715
1, 4	12	13: 26	F	716
2, 4	12	13: 41	F	717
3, 4	12	13: 56	F	720
4, 4	12	14: 11	F	721
1, 4	13	14: 26	F	722
2, 4	13	14: 41	F	722
3, 4	13	14: 56	F	721
4, 4	13	15: 11	F	721
1, 4	14	15: 26	F	716
2, 4	14	15: 41	F	715
3, 4	14	15: 56	F	708
4, 4	14	16: 11	F	704
1, 4	15	16: 26	F	701
2, 4	15	16: 41	F	697
3, 4	15	16: 56	F	686
4, 4	15	17: 11	F	685
1, 4	16	17: 26	F	675
2, 4	16	17: 41	F	671
3, 4	16	17: 56	F	667
4, 4	16	18: 11	F	661
1, 4	17	18: 26	F	654
2, 4	17	18: 41	F	650
3, 4	17	18: 56	F	649
4, 4	17	19: 11	F	644
1, 4	18	19: 26	F	642
2, 4	18	19: 41	F	644
3, 4	18	19: 56	F	641
4, 4	18	20: 11	F	638
1, 4	19	20: 26	F	637
2, 4	19	20: 41	F	638
3, 4	19	20: 56	F	637
4, 4	19	21: 11	F	632
1, 4	20	21: 26	F	636
2, 4	20	21: 41	F	636
3, 4	20	21: 56	F	637
4, 4	20	22: 11	F	641
1, 4	21	22: 26	F	639
2, 4	21	22: 41	F	642
3, 4	21	22: 56	F	643
4, 4	21	23: 11	F	648
1, 4	22	23: 26	F	649
2, 4	22	23: 41	F	651
3, 4	22	23: 56	F	655
-----TH 10-MAR-11-----				
4, 4	22	00: 11	F	659
1, 4	23	00: 26	F	661
2, 4	23	00: 41	F	264
3, 4	23	00: 56	F	205
4, 4	23	01: 11	F	179
1, 4	24	01: 26	F	161
2, 4	24	01: 41	F	670
3, 4	24	01: 56	F	678
4, 4	24	02: 11	F	674

STE#6 Smpl r Rpt 096
02:11 PGM DONE 10-MAR
SOURCE E ==> ENABLE
SOURCE F ==> FLOW



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CoCoRaHS
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AREA FORECAST DISCUSSION

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AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE SEATTLE WA
907 PM **PST** MON MAR 7 2011

.SYNOPSIS...THERE WILL BE AN ABRUPT CHANGE TO A WET AND OCCASIONALLY WINDY WEATHER PATTERN BEGINNING LATER TONIGHT AND TUESDAY...WHEN A **WARM FRONT** MOVES THROUGH THE AREA. ANOTHER FRONTAL SYSTEM WILL FOLLOW QUICKLY ON WEDNESDAY...WITH A PARADE OF SYSTEMS AFTER THAT CONTINUING INTO THE FIRST PART OF NEXT WEEK.

&&

.SHORT TERM...A SERIOUS OF **PAC** SYSTEMS WILL IMPACT **W** WA THROUGH THE SHORT TERM PERIOD...ENDING OUR STRETCH OF BENIGN WEATHER. THE FIRST SYSTEM...CURRENTLY SPINNING OVER THE **NE PAC**...WILL SEND AN OCCLUDED **FRONT** INLAND EARLY TUE. ALREADY SEEING LIGHT RAIN ON THE COASTAL **OBS** BUT SHOULD NOT SEE MUCH IN THE INTERIOR UNTIL LATE TONIGHT. THE **FRONT** IS RATHER PROGRESSIVE WITH SHOWERS MAINLY AFFECTING THE CASCADES TUE AFTERNOON. WILL ALSO SEE BREEZY SOUTH WINDS IN THE INTERIOR...WITH WINDS EASING DURING THE EVENING.

THE NEXT SYSTEM WILL ARRIVE ON WED. WILL SEE RAIN DURING THE MORNING HOURS AS THE **WARM FRONT** MOVES NORTH THROUGH THE AREA. **MOS** GUIDANCE SHOWS **TEMPS** RISING INTO THE LOWER TO **MID** 50S...NEAR TO SLIGHTLY ABOVE NORMAL. THE **COLD FRONT** WILL THEN SHIFT INLAND LATE WED AFTERNOON OR EVENING BRINGING MORE SHOWERS AND BLUSTERY WINDS. MAY NEED A **WINTER WEATHER ADVISORY** FOR SNOW IN THE CASCADES...SNOW LEVELS 2500 **FT** RISING TO AROUND 3500 **FT** IN THE AFTERNOON.

THE THIRD SYSTEM...SLATED FOR WED NIGHT INTO THURSDAY...WILL BRING ANOTHER ROUND OF ACTIVE WEATHER TO THE REGION. **TEMPS** WILL TREND BACK DOWN AS AN **UPPER LEVEL TROUGH** SLIDES IN. MORE SNOW EXPECTED IN THE MOUNTAINS WITH SNOW LEVELS HOVERING NEAR 3000 **FT**. 33

.LONG TERM...PREVIOUS DISCUSSION...EXTENDED MODELS IN GOOD AGREEMENT THIS AFTERNOON THAT WESTERN WASHINGTON WILL STAY IN AN ACTIVE PATTERN THROUGH THE FIRST PART OF NEXT WEEK. MULTIPLE WEATHER SYSTEMS MOVING THROUGH WESTERN WASHINGTON DURING THE EXTENDED PERIOD. THE BIGGEST BREAK IN THE **PRECIPITATION** RIGHT NOW LOOKS TO BE ON FRIDAY AS THE **WARM FRONT** OFFSHORE STALLS A BIT BEFORE MOVING INLAND. ON THE 12Z MODELS THE STRONGEST AND WETTEST SYSTEM WILL ARRIVE NEXT MONDAY. TIMING OF THE INDIVIDUAL SYSTEMS STILL NOT PRECISE SO FOR NOW WILL GO WITH A BROAD BRUSH RAIN LIKELY FORECAST FOR THE WHOLE EXTENDED PERIOD. FELTON

&&

.HYDROLOGY...NO FLOODING IS EXPECTED ON RIVERS IN THE FORECAST AREA DURING THE NEXT TEN DAYS...INCLUDING THE GREEN RIVER.

WHILE A WET PATTERN WILL DEVELOP TUESDAY AND CONTINUE THROUGH AT LEAST THE FIRST PART OF NEXT WEEK...THERE IS NO INDICATION THAT THIS WILL EVOLVE INTO A FLOOD-PRODUCING PATTERN.

THE ACCUMULATION OF RAINFALL DURING THE UPCOMING WET PERIOD COULD EVENTUALLY DRIVE THE UNIQUELY FLOOD-PRONE SKOKOMISH RIVER TO ITS **ADVISORY** LEVEL...OR PERHAPS EVEN **FLOOD STAGE**...BY THE END OF THE WEEKEND OR EARLY NEXT WEEK. MCDONNAL/FELTON



&&

.AVIATION...A **FRONT** WILL MOVE ONSHORE TUESDAY MORNING WITH WESTERLY **FLOW** ALOFT. **MOISTURE** INCREASING ALL LEVELS TONIGHT WITH RAIN DEVELOPING LATE. AT THE SURFACE STRONG SOUTHEAST PRESSURE GRADIENTS WILL DEVELOP TONIGHT...THEN GRADIENTS WILL TURN ONSHORE TUESDAY AFTERNOON. AIR MASS **STABLE** AND MOIST.

CEILINGS AROUND 7K **FT** THIS EVENING WILL FALL TO 2-4K **FT** LATE AND REMAIN AROUND THERE MOST OF TUESDAY IN RAIN. SOME MINOR **VISIBILITY** RESTRICTIONS AROUND FRONTAL PASSAGE...WHICH APPEARS TO BE 18Z-21Z. SOME IMPROVEMENT IN CEILINGS TUESDAY AFTERNOON.

KSEA...DISCUSSION ABOVE APPLIES. SOUTHEAST WIND 5-10 **KT** TONIGHT WILL INCREASE SOMEWHAT TUESDAY MORNING. A FEW HOURS OF GUSTY SOUTHWEST WIND 12-22 **KT** ARE LIKELY TUESDAY AFTERNOON AND EVENING. CHB

&&

.MARINE...A **FRONT** WILL BRING **SMALL CRAFT ADVISORY** SOUTHERLY WINDS TO THE AREA TONIGHT AND TUESDAY. A SURGE OF **WESTERLIES** DOWN THE STRAIT IS LIKELY TUESDAY AFTERNOON AND EVENING. A STRONGER **FRONT** WILL LIKELY BRING SOUTHERLY GALES TO MOST WATERS WEDNESDAY.

ANOTHER **FRONT** COULD AGAIN INCREASE PRESSURE GRADIENTS SIGNIFICANTLY ON THURSDAY AND THURSDAY NIGHT. YET ANOTHER **FRONT** IS DUE ABOUT SATURDAY. CHB

&&

.SEW WATCHES/WARNINGS/ADVISORIES...

WA...NONE.

PZ...**SMALL CRAFT ADVISORY** ALL WATERS FOR TUESDAY.

GALE WATCH ALL WATERS EXCEPT PUGET SOUND FOR WEDNESDAY.

\$\$


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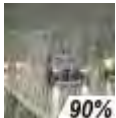
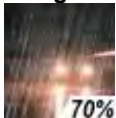
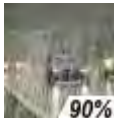

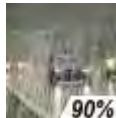

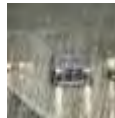
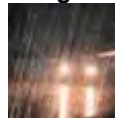
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NWS Seattle, WA
Point Forecast: Bremerton WA
 47.56°N 122.62°W (Elev. 0 ft)

[Mobile Weather Information](#) | [En Español](#)
Last Update: 7:04 pm PST Mar 7, 2011
Forecast Valid: 10pm PST Mar 7, 2011-6pm PDT Mar 14, 2011

Forecast at a Glance

Tonight	Tuesday	Tuesday Night	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday	Friday Night
								
80%	90%	70%	90%	80%	90%	60%		
Rain	Rain	Rain Likely	Rain	Rain	Rain	Showers Likely	Rain Likely	Rain Likely
Lo 41 °F	Hi 48 °F	Lo 40 °F	Hi 50 °F	Lo 41 °F	Hi 48 °F	Lo 38 °F	Hi 49 °F	Lo 40 °F

Detailed 7-day Forecast

Tonight: Rain, mainly after 4am. Steady temperature around 41. South wind around 6 mph. Chance of precipitation is 80%.

Tuesday: Rain, mainly before 4pm. High near 48. Breezy, with a south southwest wind 5 to 8 mph increasing to between 19 and 22 mph. Winds could gust as high as 31 mph. Chance of precipitation is 90%.

Tuesday Night: Rain likely, mainly after 10pm. Cloudy, with a low around 40. South southwest wind between 6 and 14 mph. Chance of precipitation is 70%.

Wednesday: Rain. High near 50. South wind between 7 and 16 mph. Chance of precipitation is 90%.

Wednesday Night: Rain. Low around 41. South southwest wind between 8 and 17 mph. Chance of precipitation is 80%.

Thursday: Rain. High near 48. Chance of precipitation is 90%.

Thursday Night: Showers likely. Mostly cloudy and breezy, with a low around 38. Chance of precipitation is 60%.

Friday: Rain likely. Mostly cloudy, with a high near 49.

Friday Night: Rain likely. Cloudy, with a low around 40.

Saturday: Rain likely. Cloudy, with a high near 49.

Saturday Night: Rain likely. Mostly cloudy, with a low around 41.


Sunday: Rain likely. Mostly cloudy, with a high near 49.

Sunday Night: Rain likely. Mostly cloudy and breezy, with a low around 40.


Monday: Rain likely. Mostly cloudy and breezy, with a high near 49.

Detailed Point Forecast [Move Down]

[Click Map for Forecast](#)
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+ Requested Location ■ Forecast Area
Lat/Lon: 47.56°N 122.62°W **Elevation:** 0 ft

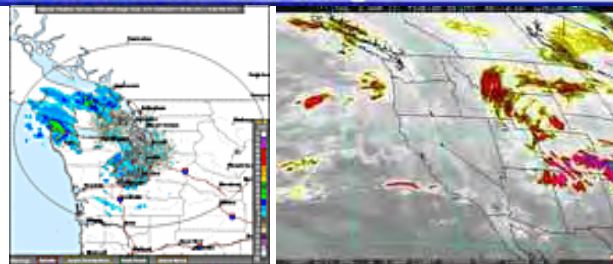
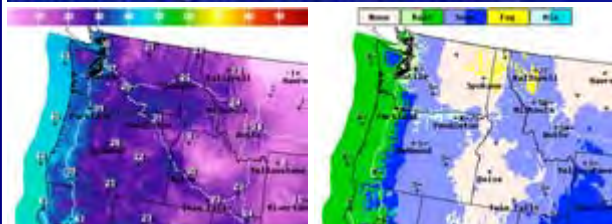


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Current Conditions [Move Up]

Bremerton, Bremerton National Airport
 Last Update on 07 Mar 21:35 PST

<div style="font-size: 1.5em; font-weight: bold; margin-bottom: 10px;">Mostly Cloudy</div> <div style="font-size: 1.5em; font-weight: bold; margin-bottom: 10px;">37°F (3°C)</div>	<table style="width: 100%;"> <tr> <td style="width: 50%;">Humidity:</td> <td>75 %</td> </tr> <tr> <td>Wind Speed:</td> <td>calm</td> </tr> <tr> <td>Barometer:</td> <td>29.95 in (N/A mb)</td> </tr> <tr> <td>Dewpoint:</td> <td>30°F (-1°C)</td> </tr> <tr> <td>Wind Chill:</td> <td>37°F (3°C)</td> </tr> <tr> <td>Visibility:</td> <td>10.00 Miles</td> </tr> <tr> <td>More Local Wx:</td> <td>3 Day History:</td> </tr> </table>	Humidity:	75 %	Wind Speed:	calm	Barometer:	29.95 in (N/A mb)	Dewpoint:	30°F (-1°C)	Wind Chill:	37°F (3°C)	Visibility:	10.00 Miles	More Local Wx:	3 Day History:
Humidity:	75 %														
Wind Speed:	calm														
Barometer:	29.95 in (N/A mb)														
Dewpoint:	30°F (-1°C)														
Wind Chill:	37°F (3°C)														
Visibility:	10.00 Miles														
More Local Wx:	3 Day History:														

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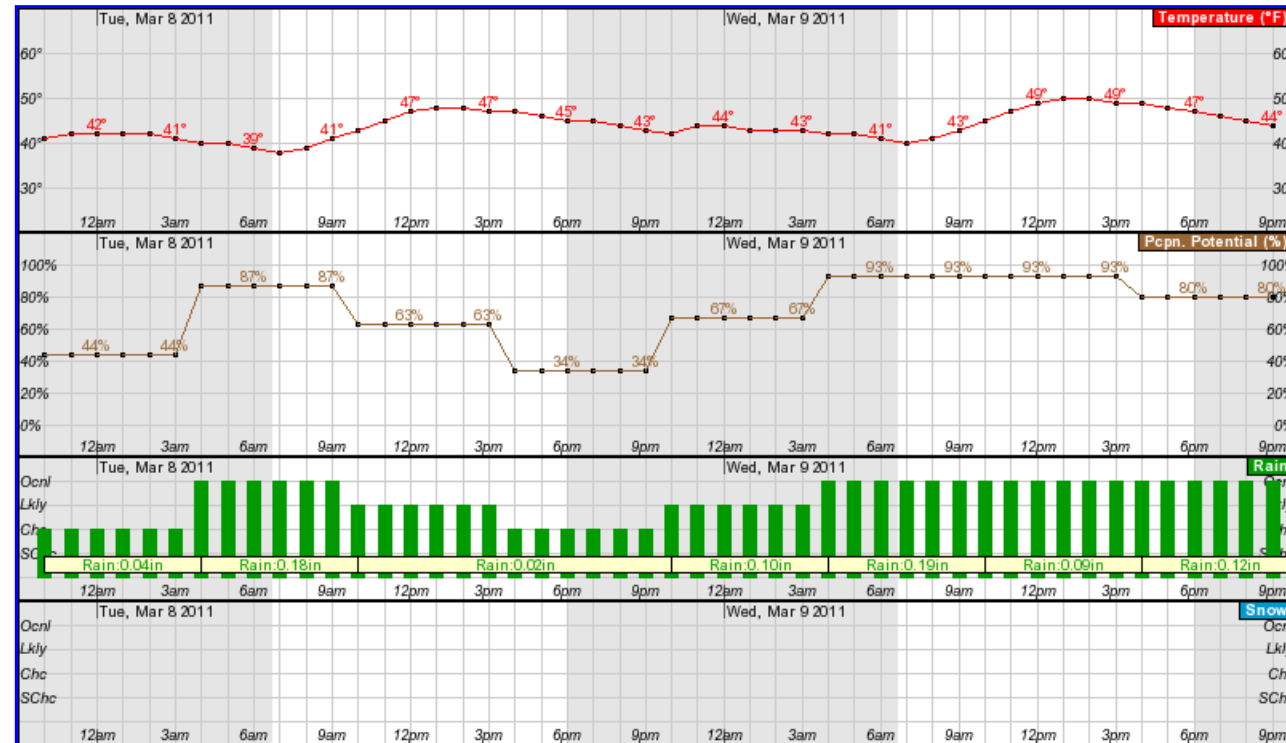
Point Forecast: Bremerton WA
47.56N 122.62W (Elev. 0 ft)

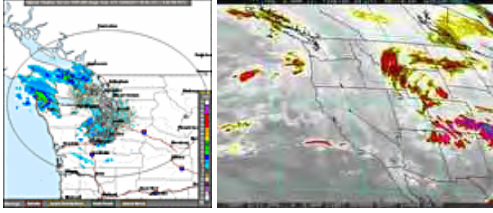
Last Update: 7:04 pm PST Mar 7, 2011

Hourly Weather Forecast Graph

[\[dashes/dots\]](#) | [\[b/w\]](#) | [\[hide menu\]](#)

Weather Elements		Weather/Precipitation
<input checked="" type="checkbox"/> Temperature (°F)	<input type="checkbox"/> Surface Wind <input type="text" value="mph"/>	<input type="checkbox"/> Thunder
<input type="checkbox"/> Dewpoint (°F)	<input type="checkbox"/> Sky Coverage	<input checked="" type="checkbox"/> Rain
<input type="checkbox"/> Wind Chill (°F)	<input checked="" type="checkbox"/> Precipitation Potential	<input checked="" type="checkbox"/> Snow
	<input type="checkbox"/> Relative Humidity	<input type="checkbox"/> Freezing Rain
		<input type="checkbox"/> Sleet

48-Hour Period Starting: [Submit](#)[Back 2 Days](#)[Forward 2 Days](#)

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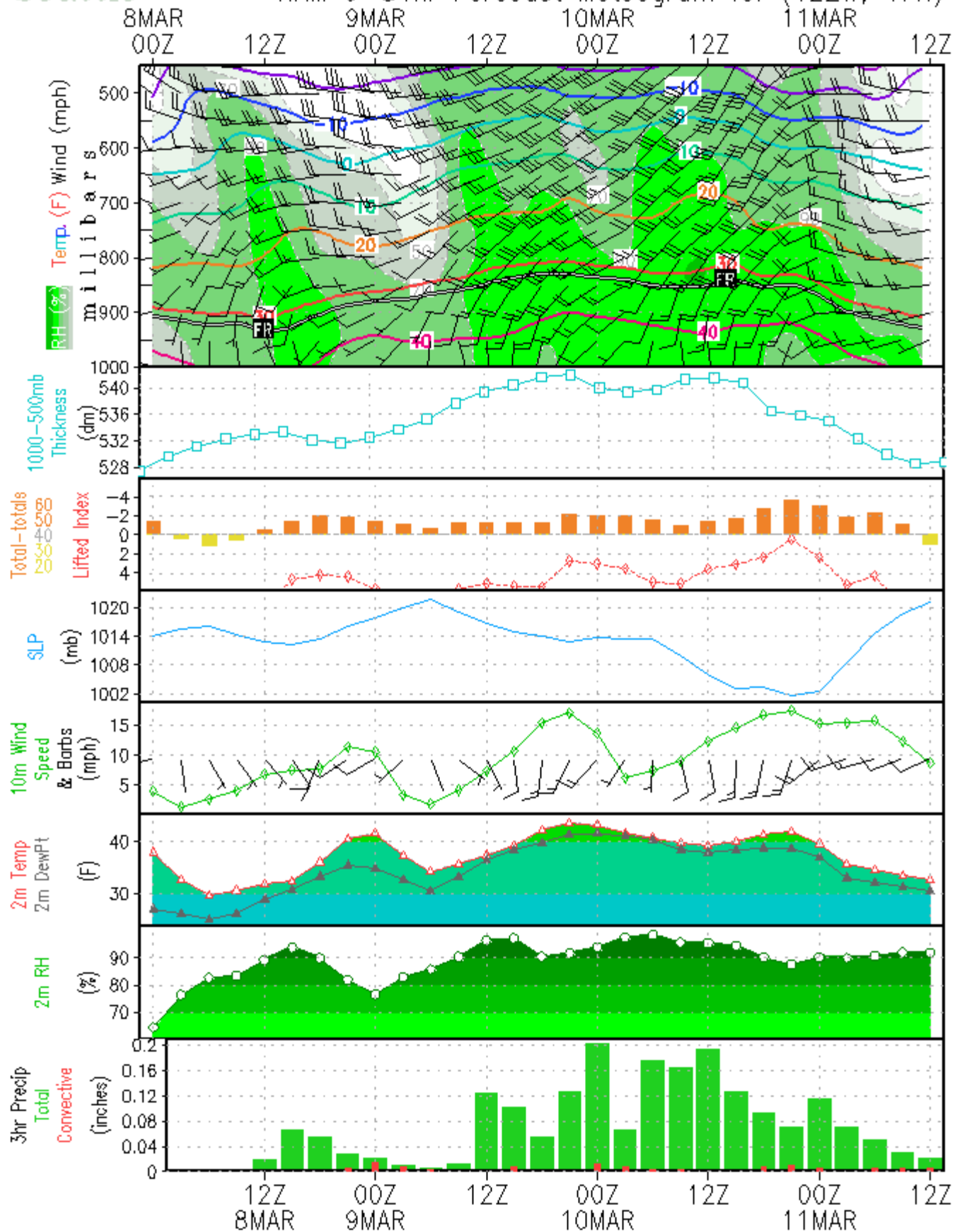
Forecast For Lat/Lon: 47.5570/-122.6540 (Elev. 0 ft)
Bremerton WA


Custom Weather Forecast Table

	Mon Mar 07				Tue Mar 08				Wed Mar 09				Thu Mar 10				Fri Mar 11				Sat Mar 12				Sun Mar 13			
Weather	Isolated Rain Showers	Slight Chance Rain Showers	Chance Rain	Chance Rain	Rain	Likely Rain Showers	Chance Rain	Likely Rain			Rain			Likely Rain Showers							Likely Rain							
Daily-Temp		High 46 Low 35				High 48 Low 38					High 50 Low 40			High 49 Low 41			High 50 Low 38				High 48 Low 41				High 49 Low 41			
Chance of Precip	25%·25%·	25%	45%	85%	65%	35%	65%	95%	95%	80%	80%	90%	90%	65%	65%	60%	60%	55%	55%	60%	60%	60%	60%	60%	60%	60%		
Precip	0.01"·0.01"·	0.01"	0.04"	0.19"	0.01"	0.01"	0.10"	0.19"	0.11"	0.13"	0.44"	0.27"	0.14"	0.03"	0.01"	0.01"	0.01"	0.01"	0.01"	0.13"	0.13"	0.04"	0.03"	0.18"	0.33"	0.01"	0.01"	
12-hr Snow Total	0"		0"			0"		0"		0"	0"		0"	0"		0"		0"	0"		0"	0"		0"	0"		0"	0"
6-Hour	4am·10am·	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	
Temp	38 · 41 ·	45	41	40	43	47	43	42	45	49	44	43	45	48	42	41	44	49	44	43	45	47	43	43	45	48	44	
Cloudiness	79%·74%·	78%	96%	99%	87%	80%	92%	100%	97%	95%	95%	94%	94%	79%	79%	83%	83%	97%	97%	98%	98%	80%	80%	80%	80%	80%	80%	
Dewpoint	37 · 37 ·	38	39	38	39	41	42	41	42	45	43	42	43	44	41	40	41	44	42	41	41	42	42	40	41	42	43	
Relative Humidity	95%·86%·	76%	93%	91%	85%	80%	96%	95%	90%	85%	96%	95%	91%	88%	97%	95%	90%	82%	91%	90%	86%	83%	93%	91%	85%	79%	96%	
Wind	SW · S ·	S	S	S	S	SW	SW	SW	S	S	SW	S	SW	S	SW	SW	S	S	S	S	S	S	SW	SW	S	SE	S	S
	3 · 6 ·	7	6	2	12	21	6	6	16	16	10	8	7	17	15	13	8	10	9	12	10	7	13	9	9	14	21	
Snow Level (ft)	981 · 981 ·	1840	1840	1915	2723	3178	3179	3668	4176	3592	3592	3103	3103	2177	2177	2000	2000	2548	2548	2958	2958	2579	2579	2711	2711	2500	2500	

Seattle


NAM 0-84hr Forecast Meteogram for (122W, 47N)





National Weather Service Forecast Office

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AREA FORECAST DISCUSSION

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AFDSEW

AREA FORECAST DISCUSSION**NATIONAL WEATHER SERVICE** SEATTLE WA920 PM **PST** TUE MAR 8 2011

.SYNOPSIS...A SERIES OF WEATHER SYSTEMS WILL MOVE THROUGH WESTERN WASHINGTON DURING THE WEEK. THE FIRST SYSTEM TO REACH THE AREA WILL MOVE THROUGH WEDNESDAY. THIS SYSTEM WILL CREATE WINDY CONDITIONS ALONG THE COAST AND OVER THE NORTH INTERIOR AS WELL AS **HEAVY SNOW** IN THE CASCADES. THE NEXT SYSTEM WILL ARRIVE ON THURSDAY WITH WINDY CONDITIONS EXPECTED IN THE WAKE OF THE **FRONT** THURSDAY NIGHT AND ANOTHER ROUND OF **HEAVY SNOW** FOR THE CASCADES. AFTER A BRIEF BREAK IN THE ACTION FRIDAY...THE ACTIVE WEATHER PATTERN WILL PICK UP AGAIN FOR THE WEEKEND INTO EARLY NEXT WEEK.

&&

.SHORT TERM...A DEEP 515 **H5 CLOSED LOW** OVER THE **NE PAC** WILL SEND A SERIES OF DISTURBANCES THROUGH **W WA** OVER THE NEXT SEVERAL DAYS...MAINTAINING AN ACTIVE WEATHER PATTERN ACROSS THE REGION.

A BRIEF BREAK IN THE WEATHER THIS EVENING...THEN RAIN INCREASING EARLY WED MORNING AS A **WARM FRONT** LIFTS NORTH THROUGH THE REGION. **IR** SATELLITE IS PRETTY IMPRESSIVE /COMMA SHAPE/ WITH A SOLID **CIRRUS** SHIELD MOVING INTO **S B.C.** AND THE TRAILING **COLD FRONT** NOW PASSING 135W. A VIGOROUS SYSTEM BUT THE SURFACE LOW WILL STAY WELL OFFSHORE...CURLING **N** TOWARD HAIDA GWAII BY 00Z THU. MODELS SHOW THE **COLD FRONT** PASSING THROUGH THE INTERIOR OF **W WA** AROUND 21Z WITH **SLY** WINDS PICKING UP ACROSS THE AREA. **HEAVY SNOW** SHOWERS ARE EXPECTED IN THE CASCADES WITH SNOW LEVELS NEAR 3500 **FT**.

THE NEXT **STORM** WILL IMPACT **W WA** ON THU AS ANOTHER OCCLUDED SYSTEM MOVES INLAND. THE NEW 00Z **NAM** BRINGS THE LOW RIGHT INTO WA...WHILE THE **GFS** SENDS IT INTO VANCOUVER ISLAND. THE 12Z GEM IS A BIT OF A COMPROMISE. EITHER WAY STILL LOOKS WINDY FOR MUCH OF THE REGION...POSSIBLE HIGH WIND ALONG THE COAST. THE INTERIOR MAY SEE STRONG SOUTH WINDS AS THE LOW PASSES THROUGH **S B.C.** LATE THUR AFTERNOON AND EVENING. WILL NEED TO MONITOR THIS SYSTEM CAREFULLY OVER THE NEXT SEVERAL RUNS. HEAVY PRECIP STILL EXPECTED IN THE CASCADES WITH SNOW LEVELS STILL NEAR 3500 **FT**.

THE NEXT **FRONT** WILL STALL OVER THE OFFSHORE WATERS ON FRI...THEN SLIDE INLAND LATE FRI NIGHT OR **SAT** MORNING. 33

.LONG TERM...PREVIOUS DISCUSSION...NOTHING NEW IN THE EXTENDED



MODELS THIS AFTERNOON WITH A SERIES OF WEATHER SYSTEM MOVING THROUGH WESTERN WASHINGTON DURING THE EXTENDED PERIOD WITH A DEEP UPPER LEVEL **TROUGH** OVER THE GULF OF ALASKA. TIMING OF THESE SYSTEMS VARIES A LITTLE FROM RUN TO RUN BUT THE IDEA OF A WET WEEKEND INTO THE FIRST PART OF NEXT WEEK REMAINS INTACT. PARENT LOWS ASSOCIATED WITH **FRONT** STAYING WELL OFFSHORE OVER THE WEEKEND. BOTH THE **GFS** AND THE **ECMWF** BRING THE PARENT LOWS CLOSER TO THE COAST FOR THE **FRONT** DURING THE EARLY PART OF NEXT WEEK. THIS COULD RESULT IN WINDY CONDITIONS ALONG THE COAST AND POSSIBLY THE NORTHWEST INTERIOR. FELTON

&&

.HYDROLOGY...THE CHANGE OVER TO A WET PATTERN WILL CAUSE WESTERN WASHINGTON RIVERS TO BE ON THE RISE BEGINNING TOMORROW. WITH THE WEATHER PATTERN BEING PROGRESSIVE...BREAKS IN BETWEEN THE SYSTEMS...IT DOES NOT APPEAR THAT A MAJOR FLOOD-PRODUCING PATTERN WILL DEVELOP.

THE CUMULATIVE RAINFALL OVER THE SOUTH SLOPES OF THE OLYMPICS COULD EVENTUALLY CAUSE THE UNIQUELY FLOOD PRONE SKOKOMISH RIVER TO GET TO **ADVISORY** OR POSSIBLY **FLOOD STAGE** AT SOME POINT DURING THIS CYCLE. THE BEST CHANCES WILL BE TOWARD THE EARLY PART OF NEXT WEEK.

FLOODING IS NOT EXPECTED ON ANY OF THE OTHER AREA RIVERS ...INCLUDING THE GREEN...DURING THE NEXT TEN DAYS. FELTON

&&

.AVIATION...A **WARM FRONT** WILL MOVE FROM SOUTH TO NORTH ACROSS THE AREA LATE TONIGHT AND WEDNESDAY WITH SOUTHWESTERLY **FLOW** ALOFT. THE AIR MASS IS **STABLE** AND MOIST. AT THE SURFACE SOUTHEASTERLY GRADIENTS WILL INCREASE TONIGHT AND REMAIN STRONG WEDNESDAY.

CLOUDS WILL INCREASE FROM THE SOUTH TONIGHT AND CEILINGS WILL RAPIDLY DROP TO 2-4K **FT**. THERE COULD BE A FEW HOURS OF CEILINGS AROUND 1-2K **FT** AND **VISIBILITY** RESTRICTIONS OF 3-5SM IN RAIN. SOUTHERLY WINDS WILL INCREASE SUBSTANTIALLY 18Z-03Z.

KSEA...SOUTHEAST WIND 4-8 **KT** TONIGHT WILL INCREASE TO 10-15 **KT** WEDNESDAY MORNING...WITH 15-25 **KT** 21Z-03Z. CHB

&&

.MARINE...A SERIES OF STRONG FRONTS WILL AFFECT THE AREA OVER THE NEXT FIVE DAYS. FIRST UP IS A **WARM FRONT** THAT WILL INCREASE SOUTHERLY GRADIENTS ON WEDNESDAY...GIVING GALES TO MOST WATERS. THE ONLY EXCEPTIONS APPEAR TO BE THE CENTRAL STRAIT AND PUGET SOUND... WHICH NEVERTHELESS SHOULD SEE 20-30 **KT**.

HOT ON THE HEELS OF THE SYSTEM WEDNESDAY IS ANOTHER ONE THURSDAY. THIS ONE SHOULD ALSO BRING GALES...POSSIBLY TO ALL WATERS... ESPECIALLY IN THE AFTERNOON WHEN THE **FLOW** IS STRONGLY ONSHORE.

FRIDAY LOOKS RELATIVELY **CALM**...BUT MORE FRONTS ARE DUE SATURDAY AND SUNDAY. CHB

&&

WA...**WINTER STORM WARNING** NORTH AND CENTRAL CASCADES WEDNESDAY. PZ...**GALE WARNING** ALL WATERS EXCEPT CENTRAL STRAIT AND PUGET SOUND FOR LATE TONIGHT AND WEDNESDAY.
SMALL CRAFT ADVISORY CENTRAL STRAIT AND PUGET SOUND.

\$\$


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Your National Weather Service forecast

Bremerton WA


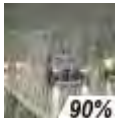
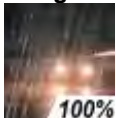
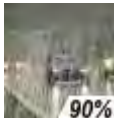

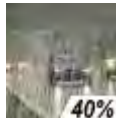

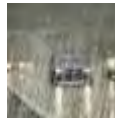
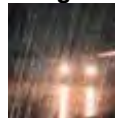


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NWS Seattle, WA
Point Forecast: Bremerton WA
 47.56°N 122.62°W (Elev. 0 ft)

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Last Update: 4:35 pm PST Mar 8, 2011
Forecast Valid: 11pm PST Mar 8, 2011-6pm PDT Mar 15, 2011

Forecast at a Glance

Overnight	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday	Friday Night	Saturday	Saturday Night
								
90%	90%	100%	90%	60%	40%	50%		
Rain	Rain	Rain	Rain	Showers Likely	Chance Rain	Chance Rain	Rain Likely	Rain Likely
Lo 44 °F	Hi 50 °F	Lo 42 °F	Hi 50 °F	Lo 40 °F	Hi 49 °F	Lo 40 °F	Hi 48 °F	Lo 40 °F

Detailed 7-day Forecast

Overnight: Rain. Steady temperature around 44. South southeast wind around 6 mph. Chance of precipitation is 90%.

Wednesday: Rain. High near 50. South southwest wind between 14 and 21 mph, with gusts as high as 29 mph. Chance of precipitation is 90%.

Wednesday Night: Rain. Low around 42. South southwest wind between 10 and 15 mph. Chance of precipitation is 100%.

Thursday: Rain. High near 50. South wind between 7 and 11 mph. Chance of precipitation is 90%.

Thursday Night: Showers likely, mainly before 10pm. Mostly cloudy, with a low around 40. West southwest wind between 13 and 21 mph, with gusts as high as 29 mph. Chance of precipitation is 60%.

Friday: A 40 percent chance of rain. Mostly cloudy, with a high near 49.

Friday Night: A 50 percent chance of rain. Cloudy, with a low around 40.

Saturday: Rain likely. Cloudy, with a high near 48.

Saturday Night: Rain likely. Mostly cloudy, with a low around 40.

Sunday: Rain likely. Mostly cloudy, with a high near 50.

Sunday Night: Rain likely. Mostly cloudy, with a low around 42.


Monday: Rain likely. Cloudy and breezy, with a high near 50.

Monday Night: Rain likely. Cloudy, with a low around 39.


Tuesday: Rain likely. Cloudy, with a high near 49.

Detailed Point Forecast [Move Down]

Click Map for Forecast [Disclaimer](#)



+ Requested Location ■ Forecast Area
Lat/Lon: 47.56°N 122.62°W **Elevation:** 0 ft



XML

Current Conditions
[Move Up]

Bremerton, Bremerton National Airport

Last Update on 08 Mar 22:35 PST

Fair

36°F
(2°C)

Humidity: 87 %

Wind Speed: calm

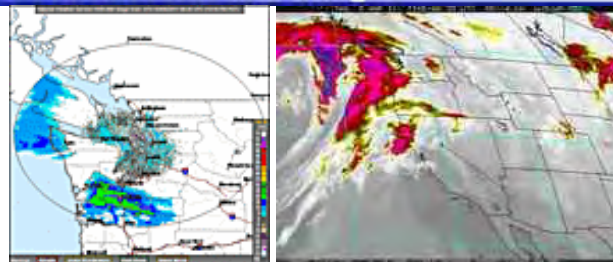
Barometer: 30.09 in (N/A mb)

Dewpoint: 32°F (0°C)

Wind Chill: 36°F (2°C)

Visibility: 10.00 Miles

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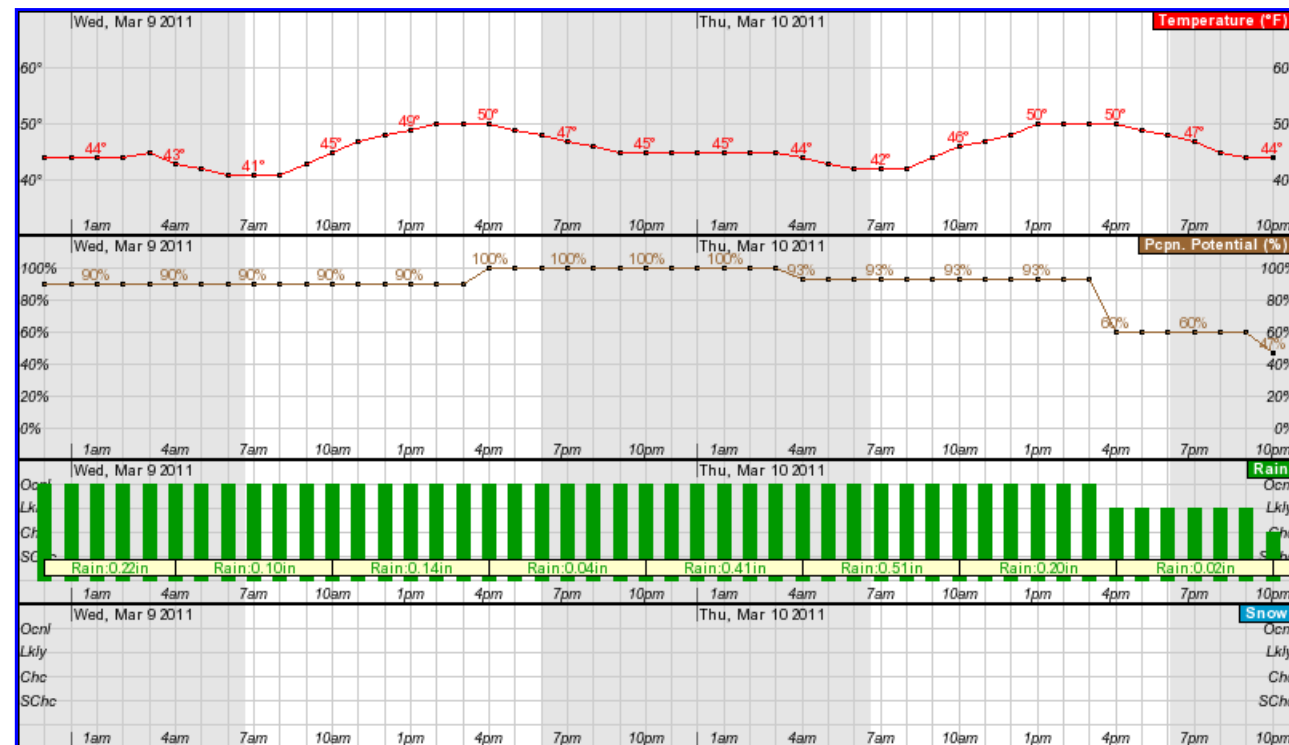
Point Forecast: Bremerton WA
47.56N 122.62W (Elev. 0 ft)

Last Update: 4:35 pm PST Mar 8, 2011

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Weather Elements		Weather/Precipitation
<input checked="" type="checkbox"/> Temperature (°F)	<input type="checkbox"/> Surface Wind mph ▼	<input type="checkbox"/> Thunder
<input type="checkbox"/> Dewpoint (°F)	<input type="checkbox"/> Sky Coverage	<input checked="" type="checkbox"/> Rain
<input type="checkbox"/> Wind Chill (°F)	<input checked="" type="checkbox"/> Precipitation Potential	<input checked="" type="checkbox"/> Snow
	<input type="checkbox"/> Relative Humidity	<input type="checkbox"/> Freezing Rain
		<input type="checkbox"/> Sleet

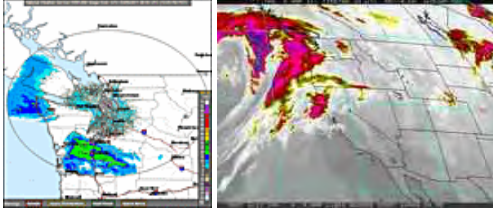
48-Hour Period Starting: 11pm Tue, Mar 8 2011 ▼

[Submit](#)[Back 2 Days](#)[Forward 2 Days](#)**Thursday, March 10 at 1am**

Temperature: 45 °F

Precipitation Potential: 100%

Rain: Occasional (80%-100%) Snow: <10%

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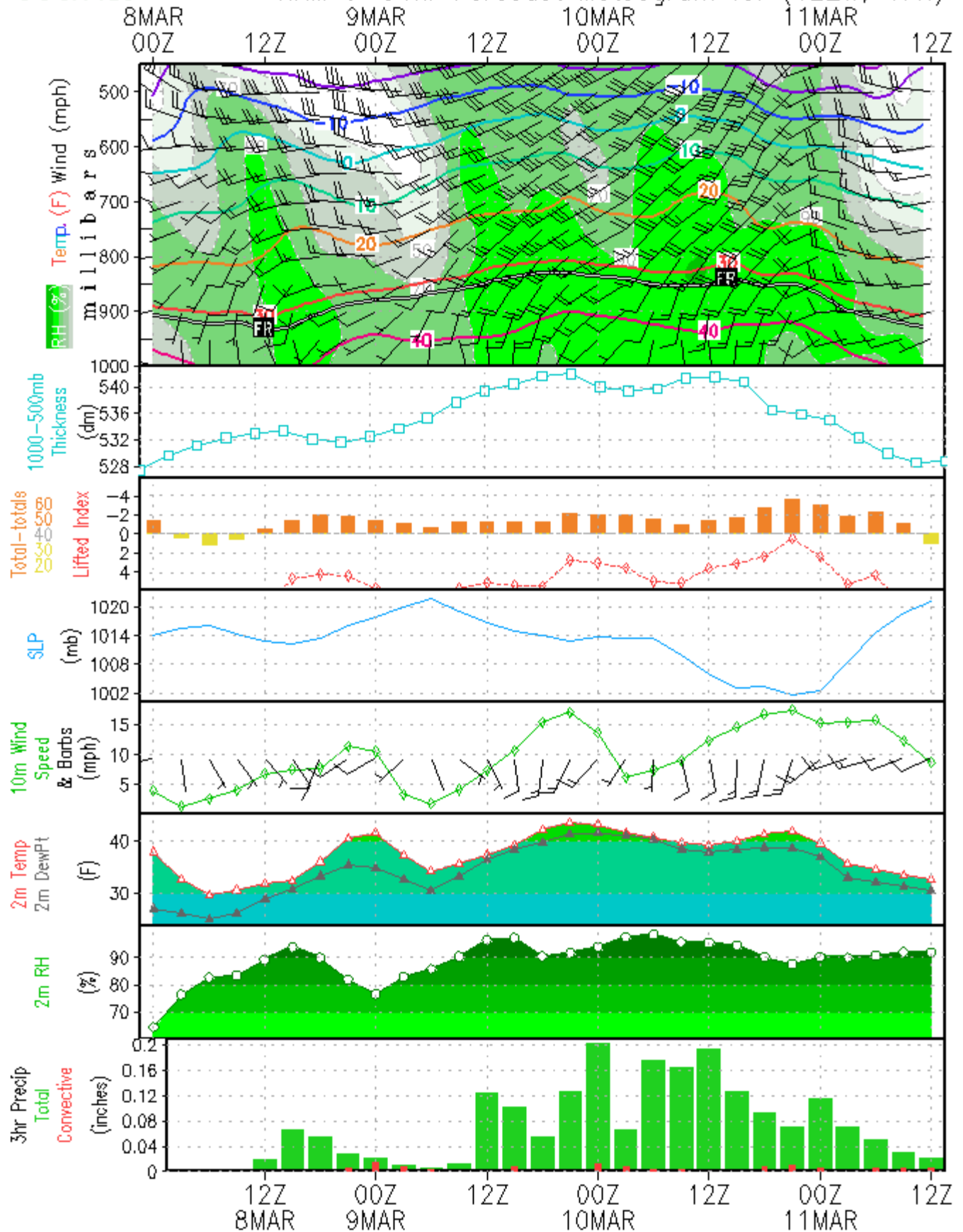
Forecast For Lat/Lon: 47.5570/-122.6540 (Elev. 0 ft)
Bremerton WA

Custom Weather Forecast Table

	Tue Mar 08				Wed Mar 09				Thu Mar 10				Fri Mar 11				Sat Mar 12				Sun Mar 13				Mon Mar 14			
Weather	Rain				Rain				Likely Rain Chance Showers				Chance Rain				Likely Rain											
Daily-Temp	High 49 Low 38				High 51 Low 40				High 50 Low 42				High 49 Low 40				High 49 Low 39				High 50 Low 40				High 49 Low 42			
Chance of Precip	95%	35%	10%	90%	90%	90%	100%	100%	95%	95%	60%	45%	45%	45%	50%	50%	65%	65%	60%	60%	60%	60%	75%	75%	65%	65%	55%	55%
Precip	0.11"	0.01"	0.00"	0.27"	0.09"	0.15"	0.04"	0.42"	0.53"	0.19"	0.02"	0.01"	0.01"	0.01"	0.01"	0.06"	0.13"	0.13"	0.04"	0.03"	0.18"	0.33"	0.01"	0.01"	0.01"	0.01"	0.01"	0.01"
12-hr Snow Total	0"				0"				0"				0"				0"				0"				0"			
6-Hour Temp	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm
Temp	40	44	49	44	42	45	51	46	44	46	50	45	43	44	49	44	42	44	49	44	42	45	50	46	44	45	49	44
Cloudiness	100%	76%	54%	93%	100%	100%	80%	100%	100%	98%	57%	57%	83%	83%	97%	97%	98%	98%	80%	80%	80%	80%	80%	80%	88%	88%	88%	88%
Dewpoint	38	41	43	41	40	43	46	45	43	44	45	42	39	41	41	40	39	41	43	41	39	41	42	42	41	41	40	40
Relative Humidity	92%	89%	79%	89%	91%	89%	82%	95%	97%	94%	81%	89%	89%	86%	73%	87%	90%	88%	79%	88%	89%	87%	75%	87%	88%	85%	71%	86%
Wind	S	SW	SW	SE	SE	S	S	S	S	S	SW	SW	S	S	S	S	S	S	S	S	SE	S	S	S	S	S	S	S
	10	17	17	5	8	20	22	10	12	7	12	17	7	8	6	9	13	9	8	8	5	14	14	14	18	15	9	13
Snow Level (ft)	1775	2872	2967	3441	3880	4386	3989	4106	3485	3417	2500	2230	2000	2000	2548	2548	2958	2958	2579	2579	2711	2711	2500	2500	2500	2500	2000	2000

Seattle

NAM 0-84hr Forecast Meteogram for (122W, 47N)





STORM EVENT REPORTS #7

For

Non-Dry Dock Stormwater Monitoring

Conducted at

Puget Sound Naval Shipyard

Bremerton, WA

Project ENVVEST Study Area

April 13, 2011



Puget Sound Naval Shipyard and Surrounding Area

PNNL Contract No.: N4523A10MP00034 Amendment 1



1.0 Introduction

Taylor/TEC conducted non-dry dock stormwater sampling tasks within the Puget Sound Naval Shipyard (PSNS) – Project ENVVEST study area between March 15th and April 15th, 2011. This was the seventh and final storm event (STE) of the 2010-2011 project sampling season. The Navy refers to these efforts as Stormwater (SW) (sampling) events; consequently both the “STE” and “SW” nomenclature are used throughout this report. A summary of the events and conditions that occurred during STE#7 (SW07) are presented in this report, with supporting information as attachments.

This STE Report contains: 1) a list of the Taylor/TEC and Navy staff that participated in the event and their base roles; 2) details regarding storm event preparatory tasks; 3) weather forecast information and targeting details; 4) a precipitation and event qualification summary; 5) a sampling information, management and validation discussion; 6) basin runoff calculations; 7) descriptive statistics and discussion of the event station monitoring data; 8) notable anomalies and variations to the PWP; and 9) action items.

Attachments to this report include: Storm and Sample Information and Validation Checklist (spreadsheet), Stormwater Field Sampling Forms and Storm Controller Notes, Chain of Custody forms, basin runoff calculation worksheet, monitoring station hydrographs, autosampler operational reports and weather forecast information.

Event Summary: Basic STE details are provided below as a “*Quick Reference*”:

- Event/s conducted: SW07
- Event Date/s: station prep. = 3/15 and 3/17; storm event tasks 4/13 – 4/15
- Current Monitoring Stations: NBK stations; PSNS008, PSNS015 and PSNS032 and CIA station PSNS096
- Monitoring Stations Sampled: PSNS008, PSNS015, PSNS032 and PSNS096
- Antecedent Conditions Met ?: Yes (greater than 2.5 days at each station)
- STE Rainfall Total (as measured at the PSNS B427 gauge): 0.78”, with stations ranging from 0.86” at PSNS008 to 0.73” at PSNS032
- Sampling Period Rainfall Total: station range = 0.76” at PSNS008 to 0.41” at PSNS096
- Samples Collected: Composite samples only at all current stations, no grab collection
- Quality Control (QC) Samples Collected: composite duplicate at PSNS008
- Based on consideration of storm event and sample validation information, were the samples collected during SW07 valid for project purposes? (Y / N, composite, grab or both): All composite samples collected during this event was valid.

2.0 Project Staff Participating in the STE

Taylor/TEC:

Dave Metallo – Project Manager (Taylor/TEC), Storm Controller, Field Event and QC Manager

Brian Rupert – Field Team Leader

Jon Berg – Field Team Member

Navy Personnel:

Bob Johnston – Project Technical Lead / Oversight

Jacquelyn Young – NPDES Program Manager

3.0 Storm Event Preparatory Tasks

On Tuesday March 15th all four of the current stormwater monitoring stations (PSNS 008, PSNS015, PSNS032 and PSNS096) were reset (after completion of STE#6) and readied for stormwater sample collection. On three separate occasions, March 17th, April 8th and April 9th, the Taylor/TEC field crew was dispatched to Shipyard to conduct storm setups in preparation for possible rain events. All of the stations were deemed to be functioning properly, operational and “sample ready” at these points (see Sections 1 and 2 of the attached *Stormwater Field Sampling Forms*). Figure 1 shows the general location of the monitoring stations at the PSNS (both CIA and NBK locations).

All stations were programmed with pre-determined autosampler enable and pacing conditions set “high” to prevent premature enabling (*sample disable mode*), as directed by the Taylor/TEC Storm Controller. Station operations were passed to the Taylor /TEC Storm Controller to be managed via telemetry. Final enabling conditions were determined by the Storm Controller closer to the onset of the storm event.

4.0 Weather Forecast Information and STE Targeting Details

During the period from March 11th (post-STE#6) until just prior to the start of STE#7 5.94” of rain fell at the Shipyard as recorded by the Navy’s gauge atop B427 (Navy’s gauge within the CIA). Between March 11th and 17th 4.61” of rainfall was measured by the Navy’s gauge; this rainfall resulting from three approximately 1” to 2” rain events. Between March 17th and the beginning of STE#7 approximately eight smaller rain events, ranging from 0.29” to 0.06”, occurred at the Shipyard contributing the remaining 1.33” of the interlude period rainfall. Rainfall during this interlude period recorded at the individual monitoring station gauges ranged from 5.98” at PSNS032 to 6.86” at PSNS008.

On April 12th the National Weather System (NWS)’s (<http://www.wrh.noaa.gov/sew/>) forecast for the Bremerton/PSNS area called for “a slow moving frontal system offshore that will thicken and cause lower clouds tonight and a chance of rain late”. Rain was expected to spread inland by the

afternoon as an upper level trough would likely bring cool unstable air to the area; there was even the possibility of thunderstorm formation. Project qualifying storm criteria (antecedent dry period, event probability and forecast rainfall depth) seemed likely to be met, so the decision was made to continue *tracking* and targeting this storm.

The routinely referenced weather models used to gain forecast information regarding the Pacific Northwest, the MM5-NAM (<http://www.atmos.washington.edu/mm5rt/rt/naminit.12km.html>) and the GFS-WRF (<http://www.atmos.washington.edu/mm5rt/rt/gfsinit.frame1.html>) (both hosted by the University of WA and initialized for the PNW) were in agreement with each other regarding area-wide rainfall, but they differed in their timing and storm rainfall depths.

The forecasted precipitation probability on April 12th was 87% for approximately 0.45" depth or greater event. However, on the 13th the forecasted rainfall depth was upgraded to 0.6 – 0.65" or greater rain event. The NWS forecast called for a rain / shower mix over the project area Wednesday into Thursday. Detailed *Weather Forecast Information* is attached to this report.

Once the field crew reported the completion of their site preparatory tasks on April 9th the Taylor/TEC Storm Controller took command of station operations via telemetry. Station status was checked at various times between the 9th and 12th, when more detailed observations began. A telemetry check at 2300 on the 12th revealed that all of the stations had reached both their 24-hour ($\leq 0.1"$) and 6-hour (no rain) dry period antecedent condition.

Subsequent weather and station checks during the morning and early afternoon of the April 13th revealed the formation of the approaching storm and spread of rain over the Shipyard. The final enable condition switches at each monitoring station were turned on and appropriately set for condition enabling (*sample ready mode*). Table 1 lists the final monitoring station enabling conditions that were used for STE#7.

Table 1. Monitoring Station Enabling Conditions

Station	Rainfall (in/hr)	Level (ft)	Conductivity (μ S/cm)	Repeatable Conductivity Enable (Y/N)	Pacing (min)	¹ Antecedent Period (24hr/6hr)
PSNS008	0.03	0.3	2000	N	15	0.00"/ 0.00"
PSNS015	0.03	0.3	2000	N	15	0.00"/ 0.00"
PSNS032	0.03	0.3	2000	Y	15	0.00"/ 0.00"
PSNS096	0.03	0.3	2000	N	15	0.00"/ 0.00"

¹Antecedent condition as checked on 4/12/11 at 2300; final enable conditions set 4/13/11 at 2100

5.0 Precipitation and STE Qualification Summary

Precipitation Summary:

The previous rain event to cause runoff (≥ 0.03 " rainfall without 6-hr gap) prior to the onset of STE#4 ranged from 2:14:10 (Days:Hours:Minutes) at PSNS015 to 2:15:00 at PSNS096, as measured by each stations rain gauge. Rain began to fall over the project site, as predicted, between 1405 and 1430 on April 13th. By 2030-hours all of the stations had recorded between 0.05" (PSNS015 and PSNS032) to 0.07" (PSNS096) of rain.

Light to moderate rain fell in intermittent bands from the onset of the STE (approximately 1400 on 4/13) until about 0600 on the 14th. Between 0.23" (PSNS096) and 0.30" (PSNS008) of rainfall was measured during this period. An intra-event dry period followed this first portion of rain, which lasted about 6.5 hours. The second half of the rain event occurred from approximately 1230 to 1740 on the 14th, as moderate to heavy rain fell across the shipyard. Between 0.49" (PSNS015 and PSNS032) and 0.56" (PSNS008) of rainfall was measured during this period of the STE. The Navy's rain gauge at B427 recorded 0.18" and 0.60" during the two rainfall periods of the STE.

A station check, via telemetry, at 2344 on April 13th revealed that PSNS008 and PSNS015 had enabled and both were on sample #9. Another station check at 0915 on April 14th indicated that PSNS032 had enabled and was on sample #25. A check of the stations at 1457 indicated that PSNS096 had enabled and was on sample #6. The conductivity condition at PSNS096 had remained above the project threshold enable value of 2000 $\mu\text{S}/\text{cm}$ for much of the event. At the time that PSNS096 had enabled (1338 4/14) over 0.50" of rain had fallen during the STE.

A check of each station's vault water level and hydrograph stage (see attached) showed that all were elevated above base flow conditions at the initiation of composite sampling (composite sample enable). A check of PSNS096 revealed that the conductivity conditions were below the project threshold ($\leq 2000\mu\text{S}/\text{cm}$) at the time it enabled. *Storm Controller notes*, which provide additional details, are attached to this report.

The storm duration ranged from about 27 hours (PSNS015, PSNS032 and PSNS096) to nearly 29 hours (PSNS008). Sampling duration ranged from 7:75 (PSNS096) to 21:75 hours (PSNS015). Sampling at PSNS096 was manually truncated at 1022 because the conductivity conditions were above the sample qualification value and would remain so for several more hours after the end of the rain.

Table 2 summarizes the rainfall amounts that occurred during the sampling period for each monitoring station as well as the PSNS rain gauge at B427 and the overall storm event depths measured at each station. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), attached to this report, provides additional storm event and sampling period rainfall information.

Table 2. Rainfall Totals for PSNS Gauge and Monitoring Stations

Station	¹ Rainfall During First Period of STE (in)	² Rainfall During Second Period of STE (in)	Sampling Period	Sampling Period Rainfall (in)	% Rainfall During Sampling Period vs. STE Period	Total Storm Event Rainfall (in)
B427	0.18	0.60	NA	NA	NA	0.78
PSNS008	0.30	0.56	4/13 2137 – 4/14 1821	0.76	88%	0.86
PSNS015	0.26	0.49	4/13 2140 – 4/14 1926	0.67	89%	0.75
PSNS032	0.24	0.49	4/14 0307 – 4/14 1753	0.58	79%	0.73
PSNS096	0.23	0.52	4/14 1338 – 4/14 2124	0.41	55%	0.75

¹As defined above as the period from approximately 1400 4/13 to 0600 on 4/14/11.

²As defined above as the period from approximately 1230 to 1740 on 4/14/11.

STE Qualification Summary:

All storm qualification conditions were met for this event. Storm event qualification conditions included wet season event date range (Oct 1 – May 1), forecast probability ($\geq 70\%$), forecasted storm depth (≥ 0.1 "), storm duration (≥ 2 hrs) and runoff occurrence / hydrograph stage (elevated above base flow). Antecedent dry period (≤ 0.1 " rain in previous 24hrs and 0" rain in previous 6hrs) qualification for this STE was also met without condition, as described above. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), documents the particular STE qualification listed above.

6.0 Sampling Information, Management and Validation

Grab Sampling:

Due to logistical constraints the Project Team decided to forgo grab sample collection during this STE. The 2010-11 PWP permits "un-paired" sampling of grab and composite parameters. Collection of only grab or only composite sample parameters does not negate data results, nor does it decrease analysis usefulness or otherwise cause data results to be tagged with qualifiers.

Composite Sampling:

Composite sample retrieval tasks and formulation procedures were managed by Taylor/TEC with support from PNNL/MSL personnel. Composite samples were collected from all four of the current monitoring stations.

Composite samples were collected via autosamplers which were operated and synchronized by a custom designed telemetered water quality control system. The composite sample collection

period is noted above in Table 2. The sampling duration ranged from 7.75 hours at PSNS096 to 21.75 hours at PSNS015. The composite sample collection times ranged from 1736 on 4/14 (PSNS032) to 2124 on 4/14 at PSNS096. Table 2 also lists the rainfall that occurred during each stations sample period and the percent of the overall storm event that was represented in the composite sample.

Methods used in preparation, autosampler collection, retrieval and formulation of the composite samples were conducted as per the PWP. Discrete time-paced samples were collected in 1000-ml plastic wedge bottles (up to 24 bottles available in each autosampler base) at a rate of 240-ml / 15 minutes (four samples/bottle, one bottle/hour) per aliquot; which, at this pacing, provides for up to 24 hours of sampling period coverage. Samplers at each station were enabled as per the conditions stated in Section 4 of this report. Each station was outfitted with either a pressure transducer (level and temperature) / conductivity (with salinity post-calculated) probe combo (INW CT2X) (PSNS008, PSNS015 and PSNS032) or a pressure transducer (level and temperature) (Campbell CS450) and a separate multi-parameter sonde (conductivity, salinity and temperature) (YSI6820) (PSNS096).

The discrete samples from each station (contained in the autosampler bases) were brought back the C106 Stormwater Lab at B147 for processing. Composite formulation occurred on April 15th between 1100 and 1415. Each individual discrete sample from each monitoring station was screened with bench-top meters for their conductivity (YSI 556) and turbidity (Hach 2100P) values. Bottles with conductivity values of ≤ 2000 $\mu\text{S}/\text{cm}$ were considered for inclusion in the overall composite sample; bottles testing greater than 2000 $\mu\text{S}/\text{cm}$ were discarded. Composite formulation followed the procedures as detailed in Section 8.2.5 of the PWP. Based on this screening criterion various bottles from each station qualified for use in their stations overall composite same. Enough qualifying sample volume was collected at each station to permit analysis of all intended composite sample analytes. Composite sample formulation of all the monitoring stations, except PSNS008, was conducted in a routine manner. See Section 9 for a description of an inadvertent inclusion of non-qualifying discrete sample portion into the overall composite sample for PSNS008.

Composite sample parameters included: hardness, TOC, DOC, TSS, total and dissolved metals and turbidity. A small portion from each of the overall composite samples was poured off for the assessment of its resultant conductivity and turbidity values. Specific details of the composite formulation, results from individual bench top testing of the discrete bottles, as well as sample IDs, sample date/time and resultant overall conductivity and turbidity values, are detailed in the *Stormwater Field Sampling Forms, Chain-of-Custody (CoC)* form and in Table A-1 (all are attached). Table 3 summarizes these results.

Table 3. Composite Sampling Details

Sample Collection Criteria:	PSNS008	PSNS015	PSNS032	PSNS096
Composite sample ID	SW07-0004	SW07-0001	SW07-0003	SW7-0002
Composite Date /Time	4/14/2011 18:21	4/14/2011 19:24	4/14/2011 17:36	4/14/2011 21:22
Overall Composite conductivity value (μS/cm)	¹ 4700	560	326	771
Composite volume (ml)	4000	8500	7000	2900
Turbidity testing results (NTU)	16	10	25	18
Composite parameters collected per PSNS PWP?	Yes	Yes	Yes	Yes

¹Overall conductivity value exceeded the 2000μS/cm project threshold value. See Section 9 for details.

All sampling and vault monitoring equipment operated as designed and programmed. Details pertaining to autosampler programming and event-specific operation of each monitoring stations' autosampler unit are contained in the attached *Sampler Reports*.

QC Samples:

A duplicate composite sample, for all project parameters, was collected during STE#7. Methods and procedures for the collection of this quality control sample was completed in accordance with Section 10.1 of the 2010-11 PWP. The composite sample duplicate was collected at PSNS008. The *Stormwater Field Sampling Form*, CoC form and Table A-1 (all are attached) contain details regarding the QC Sample associated with STE#7. Table 4 summarizes the quality control sample collection information for STE#3.

Table 4. Summary of Quality Control Sampling Information

Sample Collection Criteria:	PSNS008
Grab sample duplicate ID	NA
Grab sample duplicate date and time	NA
Grab sample duplicate conductivity value (μS/cm)	NA
Composite sample duplicate ID	SW07-0005
Composite sample duplicate date and time	4/14/2011 18:21
Was additional volume collected for MS/MSD analysis (grab, comp or both)?	No
Overall Composite Duplicate conductivity value (μS/cm)	¹ 6802
Composite Duplicate volume (ml)	4000

¹Overall conductivity value exceeded the 2000μS/cm project threshold value. See Section 9 for details.

Sample Management:

All samples were handled and managed as per Section 9 of the PWP and in a manner acceptable and within industry standards regarding practices typical for tasks of this nature. Once collected, both grab and composite samples were placed into coolers and put on ice and/or into the Stormwater Laboratory refrigerator to maintain temperatures between 2 and 6 °C.

All sample IDs, collection date and time, matrix, requested parameter analysis and other associated information were documented on a *CoC form* (attached). Samples were in direct control of project and/or laboratory personnel at all times. Samples were delivered to the testing facility, Battelle Marine Science Laboratory in Sequim, WA, in good, useable and properly chilled condition. Adequate sample volume was collected from the targeted stations to proceed with the scheduled analysis of all parameters per the 2010-11 PWP.

Sample Validation Summary:

All sample validation criteria were met for this event per Section 8.2.6 of the 2010-11 PWP. Prior to processing the samples and transferring custody to the analytical laboratory, the Taylor/TEC Field Event Lead validated the samples against certain criteria. These validation criteria included runoff occurrence / hydrograph stage, sample preparation and handling review, requested parameters, ≥ 2 hour sampling duration or 75% storm hydrograph coverage, minimum number of aliquots, minimum sample volume collected for required parameters, discrete and composite samples conductivity measurement results, quality control sample collection and anomalous conditions assessment. Table A-1 (*Storm Qualification and Sample Validation Information Checklist*), documents the particular STE qualification listed above.

7.0 Basin Runoff Calculations

Rainfall runoff volumes were calculated for each of the basins associated with the current monitoring stations for STE#7. These calculations are based on the Runoff Coefficient Method (RCM) as described in Section 7.4 of the 2010-11 PWP.

The RCM uses a formula that incorporates a coefficient that has a certain predetermined range of possible values. This range of values is assigned based primarily on the land use/land cover considerations when applied to a particular basin or land parcel. In calculating the runoff volumes for STE#7, the greatest runoff coefficient values for each land use/land cover category associated with the monitored basins were applied. The value ranges for the various land use/land cover categories assigned to each basin are listed in the attached *Runoff Calculation Tables*. Runoff calculations and details are also presented in Table A-1 (*Storm Qualification and Sample Validation Information Checklist*) (attached). Table 5 summarizes the results from these calculations.

Table 5. Monitoring Station Runoff Volume Calculations for STE#7

Station	Combined Drainage Area (Ft ²)	STE Rain Total (In)	STE Rain Total (Ft)	STE Runoff Vol. (Gal)	Sample Event Rain Total (In)	Sample Event Rain Total (Ft)	Sample Event Runoff Vol. (Gal)	% of Runoff Sampled During STE
PSNS096	635,317	0.75	0.0625	297,031	0.41	0.0342	162,377	55
PSNS032	184,658	0.73	0.0608	84,031	0.58	0.0483	66,765	79
PSNS015	2,411,321	0.75	0.0625	1,127,371	0.67	0.0558	1,007,118	89
PSNS008	429,637	0.86	0.0717	230,330	0.76	0.0633	203,547	88

8.0 Descriptive Statistics and Discussion of the Event Station Monitoring Data

Descriptive statistics for the sampling period at each monitoring station are provided in Table 6, below. These statistics include minimum, maximum, average and median for 5-minute interval rainfall data, vault level, conductivity, salinity, transducer water temperature, YSI water temperature (PSNS096 only) and tidal stage. Sampling period rainfall totals, as well as maximum 1-hour intensity and average 1-hour intensity (includes intra-event dry periods) are also included as part of each station's rainfall information.

Table 6. STE#7 Sampling Period Rainfall and Vault Parameter Descriptive Statistics

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (μS/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
PSNS008 min	0			0.07	-4	2	6.46		3.00
max	0.02			2.17	44,782	42	9.14		11.70
average	0.003			0.54	5,695	7	8.11		7.58
median	0			0.31	41	2	8.22		7.80
total	0.76	0.14	0.036						
PSNS015 min	0			0.37	11	2	7.55		3.10
max	0.02			7.97	43,922	41	11.29		11.70
average	0.003			3.81	3,637	5	9.58		7.42
median	0			3.78	184	2	9.65		7.50
total	0.67	0.14	0.031						
PSNS032 min	0			0.04	3	2	7.56		3.80

Table 6. STE#7 Sampling Period Rainfall and Vault Parameter Descriptive Statistics

	Rainfall 5-min Interval (in)	Rainfall Max 1-hr Intensity (in/hr)	Rainfall Average 1-hr Intensity (in/hr)	Vault level (ft)	Conductivity (μS/cm)	¹ Salinity (ppt)	trans temp (°C)	YSI temp (°C)	Tide Stage (ft)
max	0.02			2.74	310	2	11.63		11.70
average	0.003			0.46	20	2	9.94		7.41
median	0			0.09	11	2	9.67		7.60
total	0.58	0.13	0.039						
PSNS096 min	0			-0.08	14	0	7.21	8.67	2.00
max	0.02			6.68	41,694	40	10.51	10.70	9.50
average	0.004			3.54	10,785	10	8.88	9.46	6.06
median	0.000			3.97	438	0	8.94	9.37	6.50
total	0.41								

¹salinity calculation for PSNS008, 015 and 032 is based on an algorithm that has a lower range cut-off value of 2ppt. Actual field values may have been lower. PSNS096 used a conductivity probe (YSI6820) that utilized a different salinity algorithm function and thus is able to calculate lower low range salinity values.

Hydrograph Assessment:

The hydrographs (see attached) for all four monitoring stations showed very similar rainfall signatures. However the rainfall signature from the Navy's gauge atop B427 differs slightly from the monitoring station signatures, mostly for the initial portion of the STE.

PSNS008: After an initial rainfall of 0.13" the hydrograph shows three distinct responses before being overwhelmed by tidal influx (noted in both the pipe stage and conductivity). Then as the tide receded and the rainfall intensity increased (0.25") pipe storage effects are noted until the tide recedes further and pipe flow drains the stored runoff down to nearly base flow level. As the intra-event dry period ends with the second wave of rain the hydrograph shows its pipe stage response with only minor storage effects for the final 0.56" of rain. The temperature signature shows mixing effects of rain and tide water.

PSNS015: The onset of rain is noted in the hydrograph as two small "bumps", with storage effects taking over as the both the rainfall and tide level increased. For about three hours the tide level overcame the rainfall and inundated the vault with seawater as noted in the conductivity value. Then with increased rainfall and decreasing tide stage the saline wedge was abruptly pushed back as freshwater conditions returned. For the remainder of the STE the vault remained under freshwater conditions under storage conditions that fluctuated with tide stage. The temperature profile again showed fresh/seawater mixing with sharp peaks and valleys progressing in a non-trending manner.

PSNS032: This station is similar to PSNS008 in regard to its relatively high effective tide height (9.4'amsl), although its basin size is less than half the size of PSNS008 (12.71 acres vs. 4.80 acres). With almost an identical amount of initial rainfall (0.12") PSNS032 seemed unaffected by tidal stage. This hydrograph is interesting because it shows a good example of pipe storage effects during the first wave of rainfall and then an actual non-tidally influenced pipe stage response during the second wave of rain. A resumption of non-rain event tidal response is noted after the rainfall ends. The temperature graph shows some mixing of rain runoff with stored water.

PSNS096: With the onset of rain and falling tide stage a freshwater condition existed briefly in the vault at PSNS096 after approximately 0.07" of rainfall. However, with the rising tide and moderate to light rain, water in the vault returned to a high saline condition. Even after approximately 0.25" of rainfall the vault was only in semi-freshwater condition for about 30 minutes. Once the second wave of rain returns another 0.16" begins to return the vault to freshwater conditions along with observed pipe storage, although this balance is upset by only very brief decreases in rainfall intensity, noted by conductivity spikes. After about one last 3 hour period of freshwater in the pipe, once the rain stopped and tide began to rise the vault quickly reverted back to saline dominated conditions. The temperature graph for this event clearly shows spikes corresponding to rainfall peaks and rainwater runoff.

As mentioned above grab samples were not collected during STE#7. Composite sample markers have been applied to the hydrographs to indicate total collection time (see attached).

Telemetry System Metadata:

A review of the telemetry data collected during STE#7 indicated that PSNS008 had 90 minute salinity gap when corresponding conductivity values were below $7\mu\text{S}/\text{cm}$. However, once there was even a slight shift in the salinity concentration of the incoming vault water (in correlation to tidal effects), the conductivity probe responded as designed, and thus the salinity values became positive. This issue has been noticed during the last three STE's. The sensor was re-calibrated several times and the multiplier adjusted as well.

The conductivity record was complete for the entire STE. This parameter gap is considered to be a minor since system enabling and collection of qualified samples were not affected. Since the sensor showed improvement from event to the next and the salinity response issue was minor, the use of the sensor was continued. This was the only station where any data collection issues associated with the vault or rain gauge sensors was noted.

9.0 Notable Anomalies and Variations to the PWP

As mentioned above in Section 6, Composite Sampling and QC Samples, the overall composite sample and its duplicate from PSNS008 had final conductivity readings of $4700\mu\text{S}/\text{cm}$ and $6802\mu\text{S}/\text{cm}$, respectively. These readings were above the targeted project conductivity threshold of $\leq 2000\mu\text{S}/\text{cm}$. During the compositing process qualifying discrete sample bottles are left on the bench-top until all samples are screen. Since a duplicate sample of this station was being

performed twice as many bottles were placed on the bench-top, awaiting composite formulation. Two disqualifying bottles, numbers 7 and 8 were inadvertently placed among the qualifying containers and were included in the normal and duplicate composites (odd numbers for normal sample and even numbers for duplicate sample). The error was noted when the final conductivity readings were taken. Since there were only 7 partially bottles available for each sample there was no way to create another set of composite / composite duplicate samples. The laboratory was phoned immediately and informed about the situation. It was decided that the samples should be brought to the lab for processing via alternate/additional methods.

See the attached PSNS008 *Stormwater Field Sampling Form* for specific composite formulation details.

There were no other anomalies observed that would have otherwise caused any of the STE#7 samples to be non-representative of the conditions from which they were collected. As reported above, all intended and scheduled grab and composite samples were submitted to the MSL within holding times and without incident. All support and sampling tasks, as well as collected samples, were managed as appropriate per the PWP.

10.0 Action Items

STE#7 was the final sampling event of the 2010-11 project season. The current focus of the field efforts will be in collecting sediment samples from each of the current vaults and station demobilization tasks.



Figure 1. Stormwater Monitoring Locations within the Shipyard Boundary

ATTACHMENTS

- Storm Qualification and Sample Validation Information Checklist
- Stormwater Field Sampling Forms and Controller Notes
- Chain-of-Custody Forms
- Runoff Calculation Worksheet
- Station Hydrographs
- Autosampler Reports
- Weather Forecast Information

**Table A-1. PSNS Non-Dry Dock Stormwater Monitoring Tasks
Storm and Sample Information and Validation Checklist
Stormwater Sampling Event #7 (4/13/2011)**



This form acknowledges representativeness criteria described in the project PWP.
Mark with "Yes" to acknowledge acceptable, "No" for not acceptable, "NA" or "-" if not applicable.

1 Storm Event Data:					
Project Storm Event (STE) #	7				
Event Forecast Probability (%)	87				
PSNS C106 Rain Gauge - Storm Event Total (in.)	0.78				
Rainfall and Runoff Summary:		PSNS008	PSNS015	PSNS032	PSNS096
Last Runoff (≥ 0.03 " rainfall without 6-hr gap) Prior to STE Start (days:hrs:min)	2:14:35	2:14:10	2:14:35	2:15:0	2:15:0
Antecedent Dry Period (days: hrs: mins)	2:14:35	2:14:10	2:14:35	2:15:0	2:15:0
Rainfall Prior 24-hrs to Sampling Start	0.00	0.00	0.00	0.00	0.00
Rainfall Prior 6-hrs to Sampling Start	0.00	0.00	0.00	0.00	0.00
STE Start Date & Time	4/13/11 14:05	4/13/11 14:10	4/13/11 14:05	4/13/11 14:30	4/13/11 14:30
STE Duration (days:hrs:mins)	1:4:40	1:3:10	1:3:15	1:3:10	1:3:10
STE End Date & Time	4/14/11 18:45	4/14/11 17:20	4/14/11 17:20	4/14/11 17:40	4/14/11 17:40
Period Between Next Measureable Rain (days:hrs: mins)	1:7:55	1:8:40	1:5:35	1:7:30	1:7:30
Storm Event Total Rainfall (in)	0.86	0.75	0.73	0.75	0.75
Storm Event Max 1-hr Rainfall Intensity (in/hr)	0.14	0.14	0.13	0.14	0.14
Storm Event Average 1-hr Rainfall Intensity (in/hr)	0.030	0.028	0.027	0.028	0.028
Sampling Period Total Rainfall (in)	0.76	0.67	0.58	0.41	0.41
Sampling Period Max 1-hr Rainfall Intensity (in/hr)	0.14	0.14	0.13	0.14	0.14
Sampling Period Average 1-hr Rainfall Intensity (in/hr)	0.037	0.031	0.039	0.053	0.053
Runoff volume calculated for entire storm period (gallons)	230,330	1,127,371	84,031	297,031	297,031
Runoff volume calculated for sampling period (gallons)	203,547	1,007,118	66,765	162,377	162,377
Percentage of total storm runoff utilized during sampling period	88%	89%	79%	55%	55%
1 Sample Collection Criteria:					
Grab sample ID	N/A	N/A	N/A	N/A	N/A
Grab Date /Time	N/A	N/A	N/A	N/A	N/A
Grab sample conductivity value ($\mu\text{S}/\text{cm}$)	N/A	N/A	N/A	N/A	N/A
Hydrograph stage at grab collection	N/A	N/A	N/A	N/A	N/A
Grab parameters collected per PSNS PWP ?	N/A	N/A	N/A	N/A	N/A
Composite sample ID	SW07-0004	SW07-0001	SW07-0003	SW7-0002	SW7-0002
Composite Date /Time	4/14/2011 18:21	4/14/2011 19:24	4/14/2011 17:36	4/14/2011 21:22	4/14/2011 21:22
Overall Composite conductivity value ($\mu\text{S}/\text{cm}$)	4700	560	326	771	771
Composite volume (ml)	4000	8500	7000	2900	2900
Composite parameters collected per PSNS PWP ?	Yes	Yes	Yes	Yes	Yes
1 QC Sample Summary Information:					
Grab sample duplicate ID	N/A	N/A	N/A	N/A	N/A
Grab sample duplicate date and time	N/A	N/A	N/A	N/A	N/A
Grab sample duplicate conductivity value ($\mu\text{S}/\text{cm}$)	N/A	N/A	N/A	N/A	N/A
Composite sample duplicate ID	SW07-0005	N/A	N/A	N/A	N/A
Composite sample duplicate date and time	4/14/2011 18:21	N/A	N/A	N/A	N/A
Was additional volume collected for MS/MSD analysis (grab, comp or both) ?	No	N/A	N/A	N/A	N/A
Overall Composite Duplicate conductivity value ($\mu\text{S}/\text{cm}$)	6802	N/A	N/A	N/A	N/A
Composite Duplicate volume (ml)	4000	N/A	N/A	N/A	N/A
1 Storm and Sample Validation:					
Was the targeted STE antecedent qualified per PSNS PWP? (if no, then see next line)	Yes	Yes	Yes	Yes	Yes
Was the antecedent overage amount greater than 10% of the total rain event ?	N/A	N/A	N/A	N/A	N/A
Was runoff occurring OR was the hydrograph at least 10% above background pipe level during grab collection ? If no, explain in summary narrative.	N/A	N/A	N/A	N/A	N/A
Were a minimum of 8 aliquots collected OR does the composite sample represent at least 75% of the stations storm event rain volume ?	Yes	Yes	Yes	Yes	Yes
Were all 1-hr sampler bottles used for the Composite sample $\leq 2000 \mu\text{S}/\text{cm}$?	No	Yes	Yes	Yes	Yes
Did any anomalous conditions exist that could make samples non-representative? Explain if "Yes"	No	No	No	No	No
Based on consideration of the information above, was the sample collected during the STE valid for project purposes ? (Y / N, composite, grab or both)	Yes-composite	Yes-composite	Yes-composite	Yes-composite	Yes-composite

1 If the answer to any of these questions is "No" OR indicate non-representative conditions, then these items should be explained in the Event Narrative.

Validation Check List Completed By / Date: Pete Heltzel

Revised By / Date: 4-20-11



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

ver.020411

Station: PSNS008	MH/CB#: # 2179	Loc. Descrip. Parking area B550	Page: 1 of 1
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Section 1. Station Reset and Inspection			
Personnel: DM / BR	Weather: Overcast, rain @ times, 50's	Arrival Date/Time: 3-15-11 (1210)	
Carry-over maintenance to do prior to set-up: Resets			done? in progress
Sampler Battery Voltage	Fresh	Changed? Y N Fresh	New voltage 12.88
Modem Battery Voltage	13.35	Changed? Y (N)	New voltage —
Sample Tubing & Strainer OK?	Yes	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No)	No * - 1 hr, changed
Trands. Cable OK?	Yes	Internal Sampler Tubing OK?	NO ↓
Trands. Desiccant OK (Yes/No)	NO - changed	Tubing Replaced? (Yes/No)	980K - needs to be 0
Tele. Box Desiccant OK (Yes/No)	OK - but add. 1 fresh	Normal Smpler Program or Dup. ?	DUP
Modem Status	Good - operational	Bottles Loaded ?	Yes
Notes (including channel condition): Aliquot vol. cal'ed @ 120-ml *Replace pump head tubing R = 1.102' Cal'ed M = 1.24 Offset = -0.53 R = 1.18 M = 1.176		Lid Status?	ON
		Backflushed with DI?	Yes
		Suction line & quick connect attached?	Yes
		Smplr Status (on/off) / last screen..	OFF

Section 2. Storm Setup and Inspection			
Personnel: BR	Weather: Sunny	Arrival Date/Time: 3/17/11 (0955)	
Sampler Battery Voltage	12.78 / 12.44	Changed? Y (N) / NO	New voltage —
Modem Battery Voltage	14.31 / 13.25	Changed? Y (N) / NO	New voltage —
Sample Tubing & Strainer OK?	Yes / Yes	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No)	Yes / Yes + 2 min.
Transducer Cable OK?	Yes / Yes	Aliquot Vol. Cal'ed (Y/N & vol.)	Yes / Yes @ 120 ml
Multi-meter Cable OK	Yes / Yes	Program Reviewed (Yes/No), Dup ?	Yes / Yes
Recorded Level (FT)	0.15 8.0 7.95 (0.078)	Lids off bottles?	NO / Yes
Measured Level (FT)	0.09	Diagnostics/Distributor arm check?	NO / Yes
Offset Diff (FT)	-0.59	Backflush with DI?	Yes / NO
Level Adjusted ?	Yes	Storm Reset (1, enter) Completed	NA / Yes
Cond. Sonde Type (YSI6820 or INW-CT2X)	INW	Last screen...	Disa. 1124 4/9/11
Cond. Sonde Cal. Info. : Recorded Val. = Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val =			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) Changed Pump head Tubing - Re-calibrated. Cond offset = +20			

Section 3. Grab Sample Collection			
Personnel:	Weather:	Arrival Date/Time:	
On Composite... (Bottle #/ Aliq #)		Conductivity Reading (µS/cm):	
Grab Parameters Collected		Salinity Reading (PPT):	
Grab Sample ID	DM	Temp. Reading (°C):	
Grab Date/Time		Turbidity Reading (NTU)	
Grab Dup ID		Equipment running correctly?	
Grab Dup Date/Time		Sampler Battery Voltage (Changed?):	
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?:			
Storm Controller notified (Y or N/A)?:		Grab MS/MSD Collected ? Y / N	Ice OK?
Notes: (what meter was used for site readings, etc.) No Grab Samples Collected			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 008 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel:	<u>DM / JB</u>	Weather:	<u>Overcast, 50°s, lito breeze</u>	Arrival Date/Time:	<u>4.15.11 (0930)</u>
Sampler Battery Voltage	<u>Good</u>	Changed?	Y (N) <u>Removed</u>	New voltage	<u>—</u>
Telemetry Battery Voltage	<u>Good</u>	Changed?	Y N	New voltage	<u>—</u>
Additional Grabs (IDs, date/time)	<u>NO</u>				
Additional Dup Grab (IDs, date/time)	<u>NO</u>				
Composite Begin Time (date/time)	<u>4.13.11 (2137)</u>	Sampler Report Downloaded ?	<u>Yes</u>		
Last Aliquot Taken (date/time, bott #, aliq #)	<u>4.14.11 (1821) - aliquots after were all "NL"</u>				
Total Composite Sample Volume Collected					
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>BTL's 1-2 6,7,8; BTL's 3-4 4/8; BTL's 9-10 5/8 → 15-16 6/8</u> <u>BTL's 21-22 5/8 → 23-24 8/8</u>				
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)?	<u>Typical, OK</u>				
Storm Contoller notified (Y or N/A)?	<u>NA</u>	Which parameter?:	<u>—</u>		
Notes:	<u>Duplicate samples collected (comp.s)</u>				
Maintenance Needed:	<u>Station demob</u>				

Section 5. Compositing Scheme and QC Sampling

Personnel:	<u>DM / JB</u>	Date/Time:	<u>4.15.11 (1415)</u>	
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.)				
<u>Cond. = T.A.I. YSI 556 Turb. = Navy Hach 2100P</u>				
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smplr be included in comp smplr Y/N):				
1	77/25/Y	① 7 6764/8/N	13 X Base	19 19/29/Y
2	60/11/Y	① 8 6395/8/N	14 X flow	20 18/13/Y
3	52/12/Y	9 53/20/Y	15 X cond.s	21 18/10/Y
4	53/13/Y	10 36/20/Y	16 X ↓	22 19/10/Y
5	38277/3/N	11 X Base flow	17 21/34/Y	23 X base
6	38217/1/N	12 X cond.s	18 21/36/Y	24 X flow cond.s
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample)				
<u>Odd btl's = normal sample - used ~ 570 ml from ea.</u>				
<u>even btl's = dup sample -</u>				
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis)				
<u>Normal = Cond 4700 Turb = 16 Vol.s for both ~ 4000 ml, analysis</u>				
<u>Dup = Cond 6802 Turb = 14 per PWP</u>				
Composite Sample ID & Time: <u>SW07-0004 (1821) 4.14.11</u>				
Field Blank Collected? (date/time)	<u>NO</u>			
Blank ID:	<u>NA</u>			
Duplicate comp sample? Yes/No	<u>YES</u>			
Duplicate sample ID	<u>SW07-0005 (1821) 4.14.11</u>			

NOTES:

✶✶ ① inadvertently used btl's 7 & 8 in the comp. samples for the normal & duplicate samples; respectively. Lab has been notified - we were instructed to bring samples to lab for analysis.



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

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Station: PSNS015 MH/CB#: A42 Loc. Descrip: Drive thru lane MCDs Page: 1 of 2

Section 1. Station Reset and Inspection

Personnel: <u>DM/BR</u>	Weather: <u>Raining!! hard - 50°s</u>	Arrival Date/Time: <u>3/15/11 (1315)</u>
Carry-over maintenance to do prior to set-up: <u>Resets - underway</u>	done? <u>Yes</u>	
Sampler Battery Voltage <u>12.90 / 12.59</u>	Changed? <u>Y</u> <u>N</u> <u>Fresh</u>	New voltage <u>—</u>
Modem Battery Voltage <u>13.02 / 12.70</u>	Changed? <u>Y</u> <u>(N)</u>	New voltage <u>—</u>
Sample Tubing & Strainer OK? <u>Yes</u>	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No) <u>-1 hr, v'ed</u>
Trands. Cable OK? <u>Yes</u>	Internal Sampler Tubing OK? <u>730 k OK</u>	
Trands. Desiccant OK (Yes/No) <u>Raining - didn't check</u>	Tubing Replaced? (Yes/No) <u>Needs to be prior to storm</u>	
Tele. Box Desiccant OK (Yes/No) <u>Raining - didn't check</u>	Normal Smpler Program or Dup. ? <u>Normal</u>	
Modem Status <u>Raining - didn't check</u>	Bottles Loaded ? <u>Yes</u>	
Notes (including channel condition): <u>- Cal'ed aliquot vol = 240 ml.</u>	Lid Status? <u>ON</u>	
	Backflushed with DI? <u>Yes</u>	
	Suction line & quick connect attached? <u>Yes</u>	
	Smplr Status (on/off) / last screen.. <u>OFF</u>	

Section 2. Storm Setup and Inspection

Personnel: <u>BR</u>	Weather: <u>Partly cloudy - Light mist</u>	Arrival Date/Time: <u>3/17/11 (1850)</u>
Sampler Battery Voltage <u>12.65 / 12.59</u>	Changed? <u>Y</u> <u>(N)</u> <u>1P</u>	New voltage <u>—</u>
Modem Battery Voltage <u>14.32 / 12.70</u>	Changed? <u>Y</u> <u>(N)</u> <u>NO</u>	New voltage <u>—</u>
Sample Tubing & Strainer OK? <u>Yes / Y</u>	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No) <u>Yes / Yes + 1 min.</u>
Transducer Cable OK? <u>Yes / Y</u>	Aliquot Vol. Cal'ed (Y/N & vol.) <u>Yes / Yes</u>	
Multi-meter Cable OK <u>Yes / Y</u>	Program Reviewed (Yes/No), Dup ? <u>Yes / NO</u>	
Recorded Level (FT) <u>5.80</u>	Lids off bottles? <u>NO / Yes</u>	
Measured Level (FT) <u>5.78</u>	Diagnostics/Distributor arm check? <u>NO / Yes</u>	
Offset Diff (FT) <u>0.213 / same</u>	Backflush with DI? <u>Yes / NO</u>	
Level Adjusted ? <u>NO</u>	Storm Reset (1, enter) Completed <u>NO / Yes</u>	
Cond. Sonde Type (YSI6820 or INW-CT2X) <u>INW</u>	Last screen... <u>Disa. 0931</u>	<u>N/A 4/9/11</u>
Cond. Sonde Cal. Info. : Recorded Val. =	Meas. Val. =	Diff. = (>10% adj. offset); Offset = New Rec Val =
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) <u>changed pump head tubing / Re-calibrated.</u> <u>Cond offset = 0</u>		

Section 3. Grab Sample Collection

Personnel:	Weather:	Arrival Date/Time:
On Composite... (Bottle #/ Aliq #)	Conductivity Reading (µS/cm):	
Grab Parameters Collected	Salinity Reading (PPT):	
Grab Sample ID <u>DM</u>	Temp. Reading (°C):	
Grab Date/Time	Turbidity Reading (NTU)	
Grab Dup ID	Equipment running correctly?	
Grab Dup Date/Time	Sampler Battery Voltage (Changed?):	
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?:		
Storm Controller notified (Y or N/A)?	Grab MS/MSD Collected ? <u>Y / N</u>	Ice OK?
Notes: (what meter was used for site readings, etc.) <u>No Grabs Collected</u>		



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 015 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel:	<u>DM/JB</u>	Weather:	<u>Overcast, 50°</u>	Arrival Date/Time:	<u>4.15.11 (0900)</u>
Sampler Battery Voltage	<u>Good</u>	Changed?	Y <input type="radio"/> N <input checked="" type="radio"/>	Removed	New voltage <u>—</u>
Telemetry Battery Voltage	<u>Good</u>	Changed?	Y <input type="radio"/> N <input checked="" type="radio"/>		New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>No</u>				
Additional Dup Grab (IDs, date/time)	<u>NO</u>				
Composite Begin Time (date/time)	<u>4.13.11 (2140)</u>	Sampler Report Downloaded ?	<u>Yes</u>		
Last Aliquot Taken (date/time, bott #, aliq #)	<u>4.14.11 (2124) 4/4 BTL #24</u>				
Total Composite Sample Volume Collected	<u>All 24 btls full - 24L</u>				
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>None</u>				
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK-typical</u>					
Storm Contoller notified (Y or N/A)?	<u>NA</u>	Which parameter?:	<u>NA</u>		
Notes: <u>Rain gap 0520 4.14 → 1240 4.14 (7hr 20min)</u>					
Maintenance Needed: <u>Station Demob</u>					

Section 5. Compositing Scheme and QC Sampling

Personnel:	<u>DM/JB</u>	Date/Time:	<u>4.15.11 (1100)</u>
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.) <u>Cond. = YSI 556</u> <u>Turb = Hach 2100P</u>			
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smpl be included in comp smpl Y/N):			
1	1026/26/Y	7	7730/11/N
2	707/12.5/Y	8	3310/8/N
3	562/19/Y	9	67/15/Y
4	22,980/14/N	10	245/8/Y
5	40,376/12/N	11	1008/12/Y
6	34,416/17/N	12	398/23/Y
13	608/3/Y	14	1513/3/Y
15	1345/3.5/Y	16	591/19/Y
17	25/38/Y	18	22/20/Y
19	300/27/Y	20	25/27/Y
21	1276/2/Y	22	168/10/Y
23	Base flow X	24	Base flow X
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>17 btls, 500-ml ea = 8500 ml. Used all "yes" btls listed above.</u> <u>BTL's #23 + 24 represented baseflow conditions and where not used</u>			
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>Cond = 560 $\mu\text{S}/\text{cm}$ Turb. = 10 NTU Vol. = ~8,500 ml Analysis per PWP</u>			
Composite Sample ID & Time: <u>SW07-0001 (1924)</u> <u>4.14.11</u>			
Field Blank Collected? (date/time)	<u>NO</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

ver.020411

Station: PSNS032	MH/CB#: 5961	Loc. Descrip. NW corner B514	Page: 1 of 2
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Section 1. Station Reset and Inspection

Personnel: DM / BR	Weather: Rain, Overcast, 50°s	Arrival Date/Time: 3/15/11 (1350)
Carry-over maintenance to do prior to set-up: Reset Tasks	done? Yes	
Sampler Battery Voltage 12.61 / 12.46	Changed? Y N Fresh	New voltage —
Modem Battery Voltage 12.71 / 12.73	Changed? Y (N)	New voltage —
Sample Tubing & Strainer OK? Yes	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No) No - 1 hr. D'ed
Trans. Cable OK? Yes	Internal Sampler Tubing OK?	NO 980K
Trans. Desiccant OK (Yes/No) Yes	Tubing Replaced? (Yes/No) NO - will D prior to next	STE
Tele. Box Desiccant OK (Yes/No) Yes	Normal Smpler Program or Dup. ?	Normal
Modem Status after power cycle - Operational	Bottles Loaded ?	Yes
Notes (including channel condition): Cal'ed aliquot vol. @ 240 ml - power cycled datalogger & modem, re-powered - cal'ed lvl. R=1.93' R=1.29 offset=-0.64	Lid Status?	ON
	Backflushed with DI?	Yes
	Suction line & quick connect attached?	Yes
	Smplr Status (on/off) / last screen..	OFF

Section 2. Storm Setup and Inspection

Personnel: BR	Weather: overcast	Arrival Date/Time: 3/17/11 (1115)
Sampler Battery Voltage 12.61	Changed? Y (N) / NO	New voltage —
Modem Battery Voltage 12.78	Changed? Y (N) / NO	New voltage —
Sample Tubing & Strainer OK?	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No) Yes / OIL / changed
Transducer Cable OK? Yes / Yes	Aliquot Vol. Cal'ed (Y/N & vol.)	NO - 2.4 Hz with - Yes
Multi-meter Cable OK Yes / Yes	Program Reviewed (Yes/No), Dup ?	Yes / NO Yes / NO
Recorded Level (FT) NA } Low water	Lids off bottles?	NO / 4/4/11
Measured Level (FT) NA } level	Diagnostics/Distributor arm check?	NO / Y
Offset Diff (FT) NA }	Backflush with DI?	Yes / NO
Level Adjusted ? NA }	Storm Reset (1, enter) Completed	NO / Yes
Cond. Sonde Type (YSI6820 or INW-CT2X) INW	Last screen...	- Dis. 11903 4/4/11
Cond. Sonde Cal. Info. : Recorded Val. = Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val =		
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) (NA) water to low to field measure. changed pump head tubing / did not recalibrate due to low water level		

Section 3. Grab Sample Collection

Personnel:	Weather:	Arrival Date/Time:
On Composite... (Bottle #/ Aliq #)	Conductivity Reading (µS/cm):	
Grab Parameters Collected	Salinity Reading (PPT):	
Grab Sample ID	Temp. Reading (°C):	
Grab Date/Time	Turbidity Reading (NTU)	
Grab Dup ID	Equipment running correctly?	
Grab Dup Date/Time	Sampler Battery Voltage (Changed?):	
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?:		
Storm Controller notified (Y or N/A)?	Grab MS/MSD Collected ? Y / N	Ice OK?
Notes: (what meter was used for site readings, etc.) No Grab Samples Collected		



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 032 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel:	<u>DM / JB</u>	Weather:	<u>Overcast, 50's, lite breeze</u>	Arrival Date/Time:	<u>4.15.11 (1000)</u>
Sampler Battery Voltage	<u>Good</u>	Changed?	Y <input checked="" type="radio"/> N <input type="radio"/>	Removed	New voltage <u>—</u>
Telemetry Battery Voltage	<u>Good</u>	Changed?	Y <input checked="" type="radio"/> N <input type="radio"/>		New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>NO</u>				
Additional Dup Grab (IDs, date/time)	<u>NO</u>				
Composite Begin Time (date/time)	<u>4.14.11 (0307)</u>	Sampler Report Downloaded ?	<u>Yes</u>		
Last Aliquot Taken (date/time, bott #, aliq #)	<u>4.15.11 (0251)</u>				
Total Composite Sample Volume Collected	<u>~ 9.5 L (full BTL's were 100%)</u>				
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>BTL's 4-10 All "NL" BTL's 16-22 all "NL"</u> <u>4/4 BTL 15 = "NL" 4/4 BTL 3 = "NL"</u>				
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)?	<u>OK - Typical</u>				
Storm Controller notified (Y or N/A)?	<u>NA</u>	Which parameter?:	<u>—</u>		
Notes:					
Maintenance Needed:	<u>Station demob - last project STE</u>				

Section 5. Compositing Scheme and QC Sampling

Personnel:	<u>DM / JB</u>	Date/Time:	<u>4.15.11 (1315)</u>
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.)	<u>Cond. = T.A.I. YSI 556 Turb. = Navy's Hach 2100P</u>		
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smpl be included in comp smpl Y/N):			
1 2001/10/ Y	7 X	13 24/26/ Y	19 } non
2 68/6/ Y	8 X	14 18/27/ Y	20 } storm
3 35/12/ Y	9 X	15 509/13/ Y	21 } condition
4 X Base	10 X	16 } Base	
5 X Flow	11 26/62/ Y	17 } Flow	
6 X L	12 20/37/ Y	18 } 4	24 } ↓
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample)	<u>Used btl's 1-3 & 11 - 15 = totals ~ 7000 ml</u>		
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis)	<u>Cond. = 326 $\mu\text{S}/\text{cm}$ Turb. = 25 NTU Vol. = ~ 7000 ml Analysis per PWP</u>		
Composite Sample ID & Time:	<u>SW07 - 0003 (1736) 4.14.11</u>		
Field Blank Collected? (date/time)	<u>NO</u>		
Blank ID:	<u>NA</u>		
Duplicate comp sample? Yes/No	<u>NO</u>		
Duplicate sample ID	<u>NA</u>		

NOTES:



PSNS NPDES Non-Dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

ver.020411

Station: PSNS 096	MH/CB#: 3878	Loc. Descrip. SE of B457
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Page: 1 of 2

Pages per station

Section 1. Station Reset and Inspection			
Personnel: DM/BR		Weather: Raining!! 50°s	
Arrival Date/Time: 3/15/11 (1425)			
Carry-over maintenance to do prior to set-up: Reset Tasks		done? Yes	
Sampler Battery Voltage	12.81 12.44	Changed? Y N Fresh	New voltage —
Modem Battery Voltage	12.51 12.62	Changed? Y (N)	New voltage —
Sample Tubing & Strainer OK?	Yes	Sampler Info.	
Transducer & Telemetry System Info.		Time Display OK? (Yes/No) No - 1hr; D'ed	
Trands. Cable OK?	Yes	Internal Sampler Tubing OK? No +950K	
Trands. Desiccant OK (Yes/No)	Not checked } Raining	Tubing Replaced? (Yes/No) No - before next STE	
Telem. Box Desiccant OK (Yes/No)	Not checked } too to	Normal Smplr Program or Dup. ? Normal	
Modem Status	Not checked } Open telem. box	Bottles Loaded ? Yes	
Notes (including channel condition): Cal'ed Smplr vol. @ 240-ml - Needs pump head tubing changed		Lid Status? ON	
		Backflushed with DI? Yes	
		Suction line & quick connect attached? Yes	
		Smplr Status (on/off) / last screen.. OFF	

Section 2. Storm Setup and Inspection			
Personnel: BR		Weather: Sunny	
Arrival Date/Time: 3/17/11 (0900)			
Sampler Battery Voltage	12.91 4/9/11 =	Changed? Y (N) (N)	New voltage —
Modem Battery Voltage	13.00 4/9/11 =	Changed? Y (N) (N)	New voltage —
Sample Tubing & Strainer OK?	OK 10K	Sampler Setup	
Transducer & Multi-meter Setup		Time/Date Display OK? (Yes/No) Yes / Yes	
Transducer Cable OK?	Yes 10K	Aliquot Vol. Cal'ed (Y/N & vol.) Yes @ 240 ml	
Multi-meter Cable OK	Yes 10K	Program Reviewed (Yes/No), Dup ? Yes / NO	
Recorded Level (FT)	0.92 1.38 3.455 17.24	Lids off bottles? NO / Yes 4/9/11	
Measured Level (FT)	0.79 0.84 3.47 17.19	Diagnostics/Distributor arm check? NO / Yes	
Offset Diff (FT)	-0.49 +0.90 1-0.05	Backflush with DI? See above	
Level Adjusted ?	Yes NO / Yes	Storm Reset (1, enter) Completed NO / Yes 4/9/11	
Cond. Sonde Type (YSI6820 or INW-CT2X)	INS	Last screen... YES DASH. 0451 N/A 4/9/11	
Cond. Sonde Cal. Info. : Recorded Val. = Meas. Val. = Diff. = (>10% adj. offset); Offset = New Rec Val = N/A			
Notes: (e.g. enabling values, cond cal. meter make/model/ser#, etc.) changed pump head tubing / g re-calibrated			

Section 3. Grab Sample Collection			
Personnel:		Weather:	
Arrival Date/Time:			
On Composite... (Bottle #/ Aliq #)		Conductivity Reading (µS/cm):	
Grab Parameters Collected		Salinity Reading (PPT):	
Grab Sample ID	0	Temp. Reading (°C):	
Grab Date/Time	M	Turbidity Reading (NTU)	
Grab Dup ID		Equipment running correctly?	
Grab Dup Date/Time		Sampler Battery Voltage (Changed?):	
Sample Observations (notify storm controller if sample turbidity, odor, color, foam, or sheen look out of the ordinary): which?:			
Storm Controller notified (Y or N/A)?		Grab MS/MSD Collected ? Y / N	Ice OK?
Notes: (what meter was used for site readings, etc.) No Grab Samples Collected			



PSNS NPDES Non-dry Dock Monitoring and Support

Telemetry, 24-1L bottle set-up

Taylor Associates, Inc.

Station: PSNS 096 continued from previous pagePage: 2 of 2

Section 4. Post-Storm Sample Collection (for grab, comp or both)

Personnel: <u>DM / JB</u>	Weather:	Arrival Date/Time: <u>4.15.11 (1030)</u>
Sampler Battery Voltage	<u>Good</u>	Changed? Y N <u>Removed</u> New voltage <u>—</u>
Telemetry Battery Voltage	<u>Good</u>	Changed? Y (N) New voltage <u>—</u>
Additional Grabs (IDs, date/time)	<u>NO</u>	
Additional Dup Grab (IDs, date/time)	<u>NA</u>	
Composite Begin Time (date/time)	<u>4.14.11 (1338)</u>	Sampler Report Downloaded? <u>Yes</u>
Last Aliquot Taken (date/time, bott #, aliq #)	<u>4.15.11 (1022) #21 4/4 — Manually Stopped Prgm</u>	
Total Composite Sample Volume Collected	<u>21 BTLs w/ ~2 empty BTLs (9 aliquots listed as "NL")</u>	
Aliquots missed/NLD (date/time/bott #/aliq #)	<u>#7 4/4, #8 all, #9 1/4, #21 1-3/4</u> *Smplr indicates all aliq.'s missed, however BTL has ~250 ml	
Channel Condition / Observations (oil/sheen, floatables, turbidity, suspended solids, discoloration, odor...)? <u>OK - typical</u>		
Storm Contoller notified (Y or N/A)? <u>NA</u>	Which parameter?:	<u>—</u>
Notes: <u>Manually stopped smpler @ BTL# 21; storm had stopped ~ 4.14 @ ~1800</u>		
Maintenance Needed: <u>Station Demob - last project STE</u>		

Section 5. Compositing Scheme and QC Sampling

Personnel: <u>DM / JB</u>	Date/Time: <u>4.15.11 (1245)</u>
Conductivity & Turbidity Meter/s Info. (Manuf., Model, Serial#, Cal. info.) <u>Cond. = T.A.I. YSI 556 Turb = Navy's Hach 2100P</u>	
Conductivity & Turbidity Testing (List ind. smplr bottle; cond. reading in $\mu\text{S}/\text{cm}$; turb. reading in NTU; will ind. smplr be included in comp smplr Y/N):	
1 1646 / 17 / Y	7 4470 / 16 / N
2 273 / 19 / Y	8 720 / 13 / Y
3 23,200 / 9 / N	9 15,194 / 10 / N
4 248 / 14 / Y	10
5 32,673 / 5 / N	11
6 41,580 / 3 / N	12
	18
	19
	21
	↓ All Base flow and NON-Storm conditions - NOT USED
Brief Description of Compositing Scheme: (include what bottles, based on bench-top screening above, where used for the overall composite sample) <u>Used. 50 contents of BTLs 1, 2, 4 + 8 → ~2900 ml</u>	
Overall Composite Info. (include conductivity and turbidity measurements, volume and requested analysis) <u>Cond. = 771 $\mu\text{S}/\text{cm}$ Turb. = 18 Vol. = ~2900 ml. Analysis per PWP</u>	
Composite Sample ID & Time: <u>SW07-0002 (2122) 4.14.11</u>	
Field Blank Collected? (date/time)	<u>NO</u>
Blank ID:	<u>NA</u>
Duplicate comp sample? Yes/No	<u>NO</u>
Duplicate sample ID	<u>NA</u>

NOTES:

PSNS NDDSW Monitoring Project Storm Control Work Sheet

Rev. 041311

Sheet __1__ of ____

Date:	4/12/2011				Sampling Support Personnel:		D. Metallo,						
STE #	7	Antecedent Dry Cond. Met ?	Yes	Tidal Info:	4-13: 0207 11' H, 0827 5.4' L, 1324 9' H, 1957 1.2' L; 4-14: 0248 11.4' H, 0914 3.9' L, 1440 9.6' H, 2057 1.7' L								
Storm Controller:	Dave Metallo			Grab sampling Info.									
Pre-Storm / Weather Details:	GFS: 4-13 start rain ~0900 last for an hour, more rain 1400-1500, heavier rain starts 4-14 1000 lasts for ~4 hrs. NAM: start rain ~1200 lasts for an hour then tails off until 4-14 @ 0600 lasting until 0800, then 2nd wave 1700 to 1900. Rain depth forecasted for Bremerton 36 hr period (4-13 1100 to 4-14 2300) is ~0.50" ** Both GFS and NAM have updated to show storm start around 0400 4-14 and last for ~18 hrs.												
Telemetry Measurements:	DATE/TIME (24HR)												
STATION:	4-12-11 (2300)	4-13-11 (0909)	1205	2030	2344	4-14-11 (0915)	1457	2225		4-15-11 (1000)			
PSNS008 Rain ¹	0 / 0	0 / 0	0 / 0	0.02 / 0.06	0.02 / 0.13	0 / 0.30	0.15 / 0.58	0 / 0.75					
PSNS008 Level		0.07	0.06	0.2	0.23	0.09	0.48	0.09					
PSNS008 Cond.		21,600	7,900	93	41	55	1	91					
Smpl Marker		0	0	0	9	47	70	96	DONE				
PSNS015 Rain	0 / 0	0 / 0	0 / 0	0.02 / 0.05	0.02 / 0.12	0 / 0.26	0.14 / 0.53	0 / 0.75					
PSNS015 Level		2.27	4.59	0.4	3.49	0.41	5.62	0.35					
PSNS015 Cond.		2,400	7,300	150	95	317	12	220					
Smpl Marker		0	0	0	9	47	70	96	DONE				
PSNS032 Rain	0 / 0	0 / 0	0 / 0	0.02 / 0.05	0.01 / 0.10	0 / 0.24	0.14 / 0.51	0 / 0.73					
PSNS032 Level		-0.01	-0.01	0.01	0.03	0.06	0.55	0.09					
PSNS032 Cond.		34	33	3	3	3	11	3					
Smpl Marker		0	0	0	0	25	48	78		96	DONE		
PSNS096 Rain	0 / 0	0 / 0	0 / 0	0.04 / 0.07	0.01 / 0.11	0 / 0.23	0.14 / 0.51	0 / 0.75					
PSNS096 Level		3.38	5.72	-0.01	4.7	1.48	6.63	0.65					
PSNS096 Cond.		42,200	42,600	1,442	41,800	41,800	227	41,200		man. Stop @ ~84	DONE		
Smpl Marker		0	0	0	0	0	6	35					
Enabling Information:									Notes: Need to coord grab tasks with the Navy. **Field notebook is in the PSNS015 enclosure. Spoke with Bruce and Bob around noon 4-13; both indicated the desire to continue to track storm event and to proceed with composite sample collection. Checked NWS 2030 and rain depth has been increased to approx 0.60"				
Sample Staion:	PSNS008		PSNS015		PSNS032		PSNS096						
Rain enable (in/hr)	1	0.03	1	0.03	1	0.03	1	0.03					
Level Enable (ft)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3					
Cond. (µS/cm)	2000	2000	2000	2000	2000	2000	2000	2000					
Repeat. Cond Set ?	No	No	No	No	No	No	No	No					
Date	13-Apr	13-Apr	13-Apr	13-Apr	13-Apr	13-Apr	13-Apr	13-Apr					
Pacing Rate (min)	22.5	15	22.5	15	22.5	15	22.5	15					
Date / Time	4-12 2300	4-13 2100	4-12 2300	4-13 2100	4-12 2300	4-13 2100	4-12 2300	4-13 2100	Comp Dup ? / where:		PSNS008		

¹Rain depths are reported as 1-hr / 24-hr totals

Date: 4.15.2011

Page: 1 of 1

Project No.: N4523A10MP00034 Amend.1

Project: PSNSNon-dry Dock SW 2010

Marine Sciences Laboratory
1529 West Sequim Bay Road
Laboratory: Battelle MSL
Attention: Jill Brandenberger

Attention: Jill Brandenberger

Phone: (360) 681-4564

Relinquished by: <u><i>Dave Metallo</i></u> <u>4-15-11</u> <u>(1713)</u>		
<u>Signature</u>	<u>Date</u>	<u>Time</u>
<u>Dave Metallo</u>	<u>Taylor / TEC</u>	
<u>Printed Name</u>	<u>Company</u>	

Received by: Jim Brandenberger 4/15/11
Signature Jim Brandenberger 1713
Printed Name

Total # of Containers:	5
Shipment Method:	Hand delivery
Sample Disposition:	

Relinquished by:		
Signature	Date	Time
Printed Name	Company	

Received by:
Signature
Printed Name

Distribution:
1) PNNL
2) CAS
3) TAI

- ① No lab. turbidity analysis required
- ② This is the duplicate of PSN5008
- ③ Cond. values for these samples $> 2000 \mu\text{S/cm}$. Process accordingly

**PSNS NDDSW Monitoring
Stormwater Outfall Total Discharge Volume Estimation Equations**

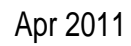
PSNS Drainage Basin	Total Basin Area (ft ²)	Type of Surface	Percentage of Drainage Basin Surface Type	Area of Basin Surface Type (ft ²)	¹ Runoff Coefficient Range	Area of Basin Surface Type with Maximum Coefficient Value Applied (ft ²)	² Total Discharge Volume (ft ³)
096	717,872	Impervious	97	696,336	0.6 – 0.9	626,702	R(635,317)
		Pervious	3	21,536	0.2 – 0.4	8,615	
032	208,653	Impervious	97	202,393	0.6 – 0.9	182,154	R(184,658)
		Pervious	3	6,260	0.2 – 0.4	2,504	
015	4,018,862	Impervious	50	2,009,431	0.5 – 0.8	1,607,549	R(2,411,321)
		Pervious	50	2,009,431	0.25 – 0.4	803,772	
008	553,650	Impervious	94	520,431	0.5 – 0.8	416,349	R(429,637)
		Pervious	6	33,219	0.2 – 0.4	13,288	

Calculation Worksheet:

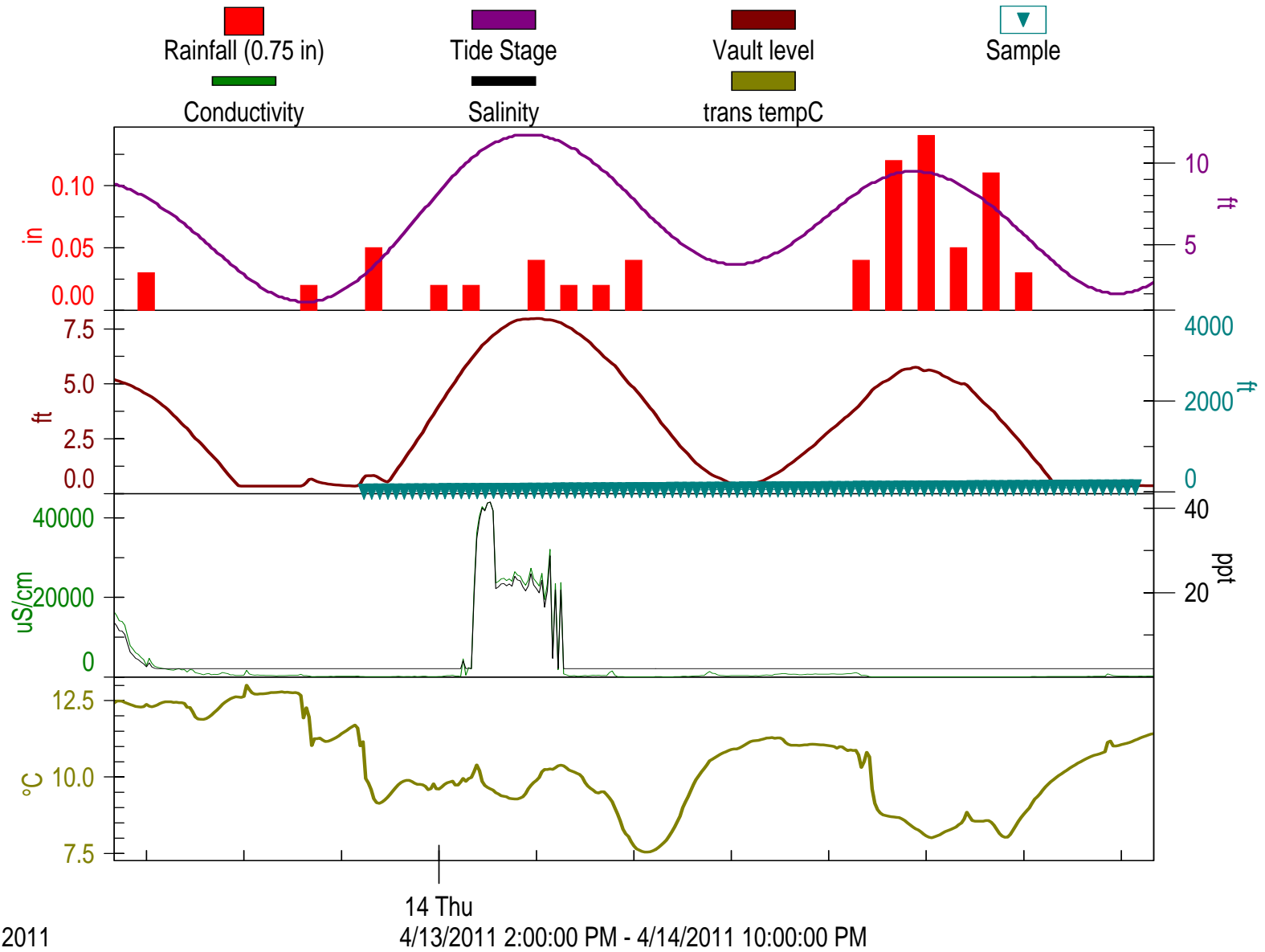
STE#7 4/13/2011

STATION	Combined Drainage Area (FT ²)	ENTER: STE Rain Total (in)	STE Rain Total (FT)	STE Runoff Vol. (gal)	ENTER: Smpl Evnt Rain Total (in)	Smpl Evnt Rain Total (FT)	Sample Event Runoff Vol. (gal)
096	635,317	0.75	0.0625	297,031	0.41	0.0342	162,377
032	184,658	0.73	0.0608	84,031	0.58	0.0483	66,765
015	2,411,321	0.75	0.0625	1,127,371	0.67	0.0558	1,007,118
008	429,637	0.86	0.0717	230,330	0.76	0.0633	203,547

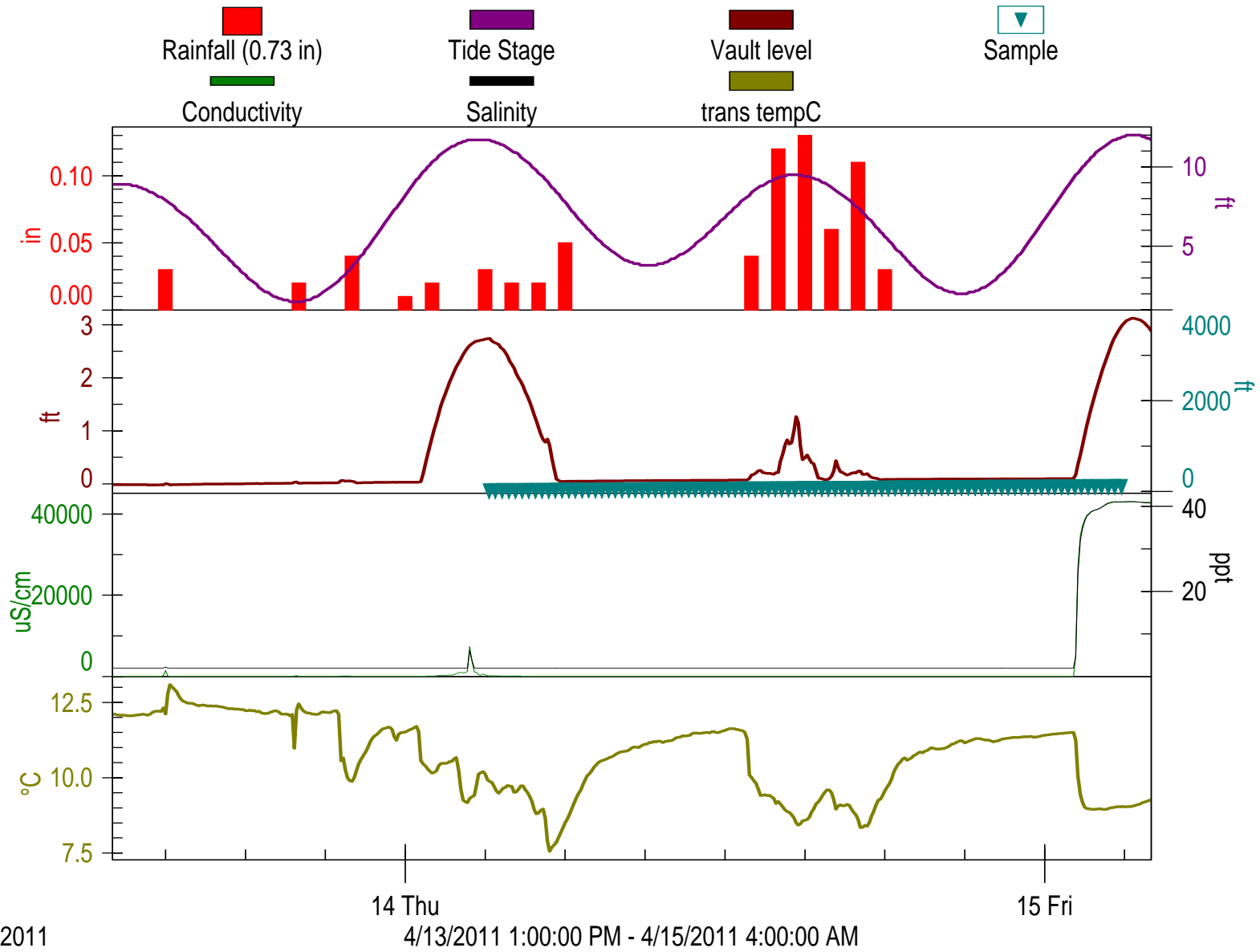
PSNS 008
STE#7 4-13-2011



PSNS 015 STE#7 4-13-2011

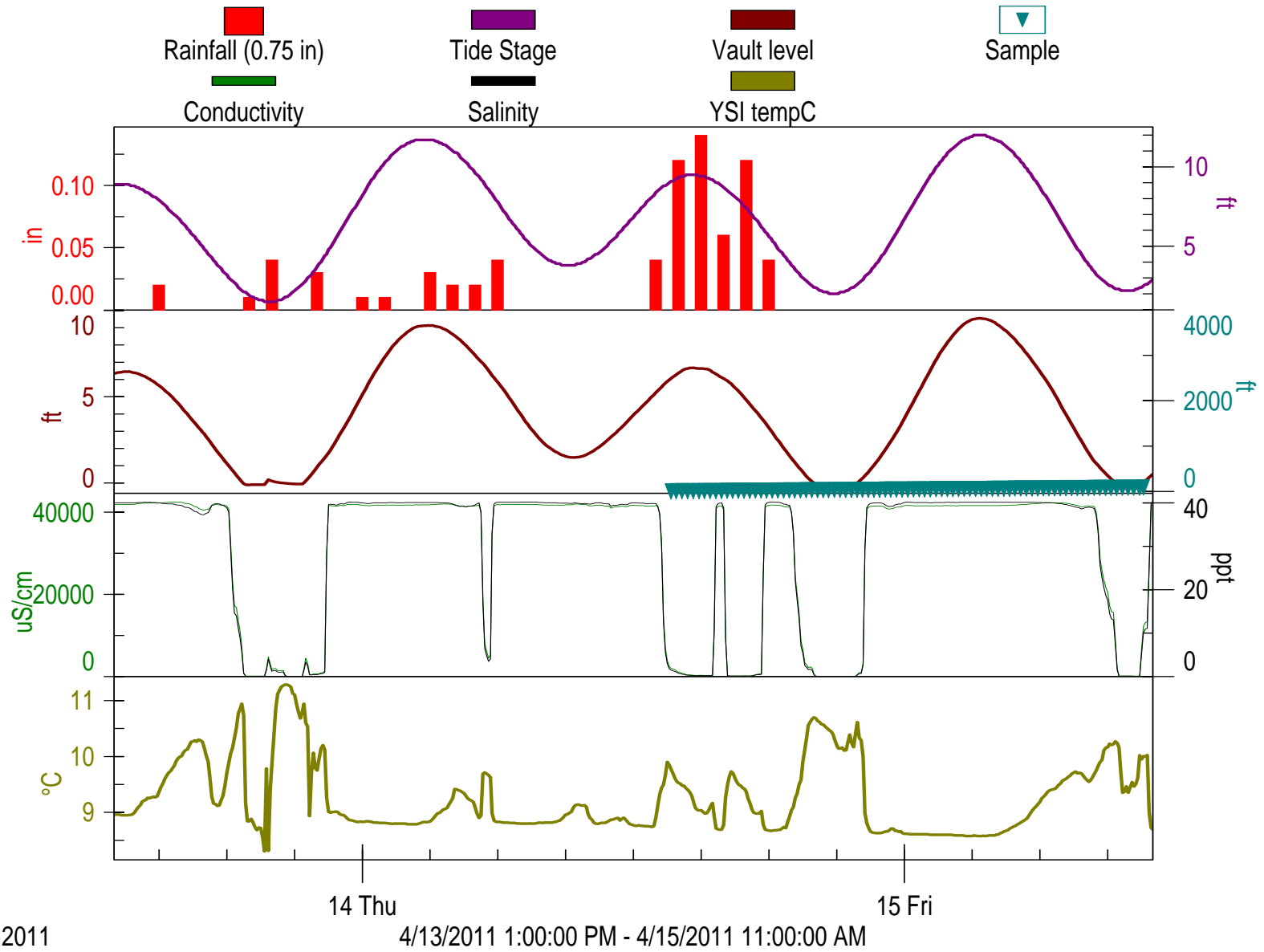


PSNS 032
STE#7 4-13-2011

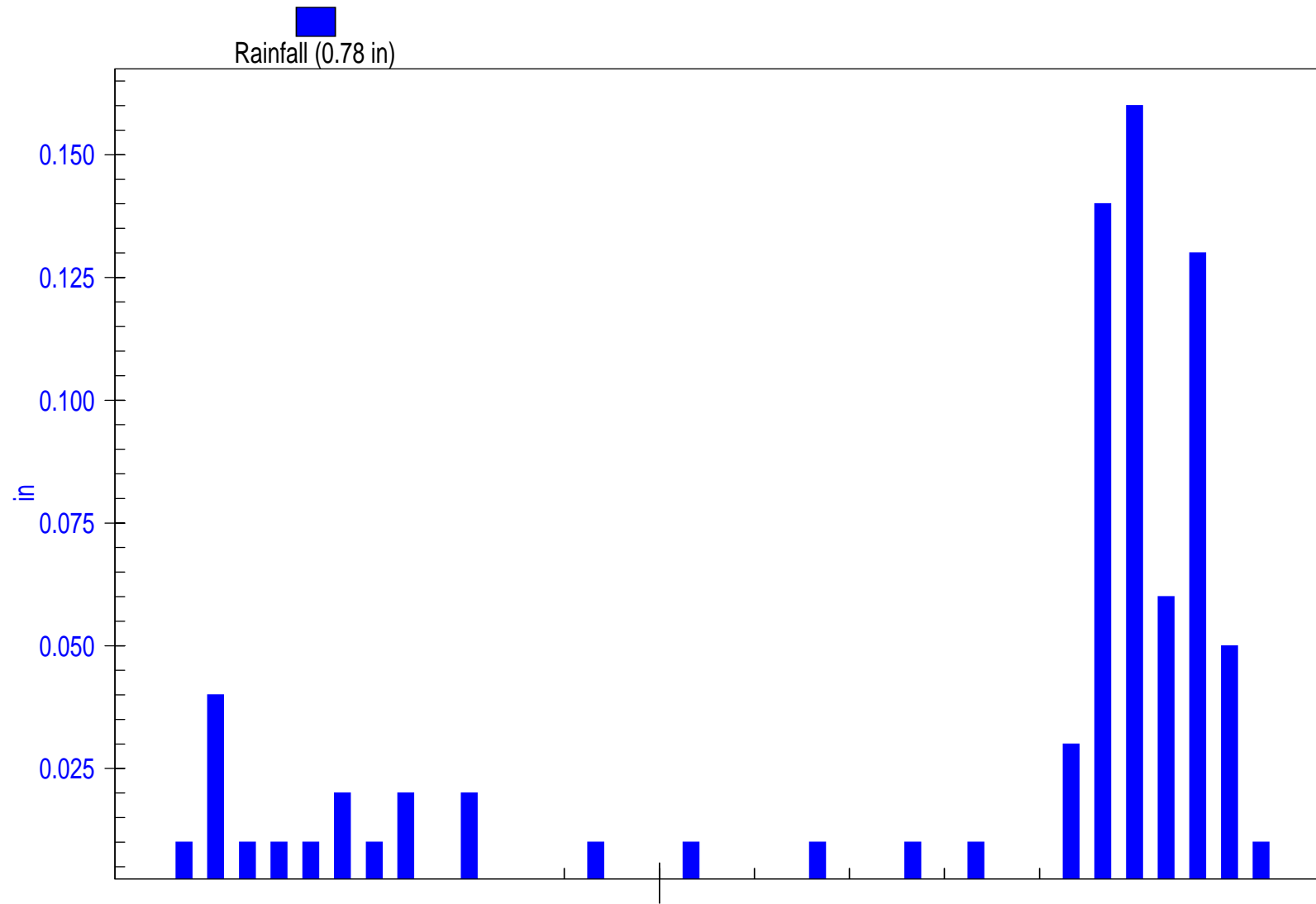


Apr 2011

PSNS 096
STE#7 4-13-2011



STE#7 4-13-11



Apr 2011

14 Thu
4/13/2011 6:48:22 AM - 4/14/2011 8:52:08 PM

PSNS008 SE#7 SmpI Rpt

SAMPLER ID# 3293179321 09:55 15-APR-11

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS008DUP"

SITE DESCRIPTION:

"PSNS008DUP"

UNITS SELECTED:

LENGTH: ft

24, 1000 ml BTLS
16 ft SUCTION LINE
10 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
2 BOTTLES/SAMPLE
8 SAMPLES/BOTTLE

VOLUME:

120 ml SAMPLES

ENABLE:

NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I /01= NONE
I /02= NONE
I /03= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 3293179321 09:56 15-APR-11
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS008DUP
PROGRAM: PSNS008DUP
Program Started at 11:23 SA 9-APR-11
Nominal Sample Volume = 120 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	LIQUID	COUNT

11:23 PGM DISABLED						
WE 13-APR-11						
21:37 PGM ENABLED						
1,8	1-2	21:37	E			404
2,8	1-2	21:51	F			400
3,8	1-2	22:06	F			400
4,8	1-2	22:21	F			402
5,8	1-2	22:36	F			400
6,8	1-2	22:51	F	NL		*
7,8	1-2	23:06	F	NL		*

PSNS008 SE#7 SmpI Rpt

8, 8	1-2	23: 21	F	NL	*
1, 8	3-4	23: 36	F		402
2, 8	3-4	23: 51	F		403
-----TH 14-APR-11-----					
3, 8	3-4	00: 06	F		404
4, 8	3-4	00: 21	F	NL	*
5, 8	3-4	00: 36	F		401
6, 8	3-4	00: 51	F		401
7, 8	3-4	01: 06	F		396
8, 8	3-4	01: 21	F		398
1, 8	5-6	01: 36	F		398
2, 8	5-6	01: 51	F		396
3, 8	5-6	02: 06	F		391
4, 8	5-6	02: 21	F		398
5, 8	5-6	02: 36	F		396
6, 8	5-6	02: 51	F		395
7, 8	5-6	03: 06	F		392
8, 8	5-6	03: 21	F		397
1, 8	7-8	03: 36	F		396
2, 8	7-8	03: 51	F		395
3, 8	7-8	04: 06	F		397
4, 8	7-8	04: 21	F		398
5, 8	7-8	04: 36	F		397
6, 8	7-8	04: 51	F		398
7, 8	7-8	05: 06	F		398
8, 8	7-8	05: 21	F		403
1, 8	9-10	05: 36	F		404
2, 8	9-10	05: 51	F		404
3, 8	9-10	06: 06	F		402
4, 8	9-10	06: 21	F		408
5, 8	9-10	06: 36	F	NL	*
6, 8	9-10	06: 51	F	NL	*
7, 8	9-10	07: 06	F	NL	*
8, 8	9-10	07: 21	F	NL	*
1, 8	11-12	07: 36	F	NL	*
2, 8	11-12	07: 51	F	NL	*
3, 8	11-12	08: 06	F	NL	*
4, 8	11-12	08: 21	F	NL	*
5, 8	11-12	08: 36	F	NL	*
6, 8	11-12	08: 51	F	NL	*
7, 8	11-12	09: 06	F	NL	*
8, 8	11-12	09: 21	F	NL	*
1, 8	13-14	09: 36	F	NL	*
2, 8	13-14	09: 51	F	NL	*
3, 8	13-14	10: 06	F	NL	*
4, 8	13-14	10: 21	F	NL	*
5, 8	13-14	10: 36	F	NL	*
6, 8	13-14	10: 51	F	NL	*
7, 8	13-14	11: 06	F	NL	*
8, 8	13-14	11: 21	F	NL	*
1, 8	15-16	11: 36	F	NL	*
2, 8	15-16	11: 51	F	NL	*
3, 8	15-16	12: 06	F	NL	*
4, 8	15-16	12: 21	F	NL	*
5, 8	15-16	12: 36	F	NL	*
6, 8	15-16	12: 51	F	NL	*
7, 8	15-16	13: 06	F		405
8, 8	15-16	13: 21	F		404
1, 8	17-18	13: 36	F		408
2, 8	17-18	13: 51	F		408
3, 8	17-18	14: 06	F		403
4, 8	17-18	14: 21	F		402
5, 8	17-18	14: 36	F		408

PSNS008 SE#7 SmpI Rpt

6,8	17-18	14: 51	F		402
7,8	17-18	15: 06	F		402
8,8	17-18	15: 21	F		402
1,8	19-20	15: 36	F		407
2,8	19-20	15: 51	F		403
3,8	19-20	16: 06	F		408
4,8	19-20	16: 21	F		404
5,8	19-20	16: 36	F		402
6,8	19-20	16: 51	F		402
7,8	19-20	17: 06	F		408
8,8	19-20	17: 21	F		407
1,8	21-22	17: 36	F		404
2,8	21-22	17: 51	F		408
3,8	21-22	18: 06	F		402
4,8	21-22	18: 21	F		402
5,8	21-22	18: 36	F	NL	*
6,8	21-22	18: 51	F	NL	*
7,8	21-22	19: 06	F	NL	*
8,8	21-22	19: 21	F	NL	*
1,8	23-24	19: 36	F	NL	*
2,8	23-24	19: 51	F	NL	*
3,8	23-24	20: 06	F	NL	*
4,8	23-24	20: 21	F	NL	*
5,8	23-24	20: 36	F	NL	*
6,8	23-24	20: 51	F	NL	*
7,8	23-24	21: 06	F	NL	*
8,8	23-24	21: 21	F	NL	*
21: 22 PGM DONE 14-APR					

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW
 ERROR NL ==> NO LI QUI D DETECTED!

PSNS015 STE#7 SmpI Rpt

SAMPLER ID# 2425481222 09:42 15-APR-11

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS015"

SITE DESCRIPTION:

"PSNS015"

UNITS SELECTED:

LENGTH: ft

24, 1000 ml BTLS
22 ft SUCTION LINE
18 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 ml SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

PSNS015 STE#7 SmpI Rpt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I /01= NONE
I /02= NONE
I /03= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 2425481222 09:42 15-APR-11
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****

SITE: PSNS015
PROGRAM: PSNS015
Program Started at 11:43 SA 9-APR-11
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	LIQUID	COUNT
						TO

11:43 PGM DISABLED						
WE 13-APR-11						
21:40 PGM ENABLED						
1,4	1	21:40	E			816
2,4	1	21:54	F			816
3,4	1	22:09	F			817
4,4	1	22:24	F			822
1,4	2	22:39	F			807
2,4	2	22:54	F			797
3,4	2	23:09	F			792

PSNS015 STE#7 Smpl Rpt

4, 4	2	23: 24	F	788
1, 4	3	23: 39	F	776
2, 4	3	23: 54	F	770
-----TH 14-APR-11-----				
3, 4	3	00: 09	F	762
4, 4	3	00: 24	F	752
1, 4	4	00: 39	F	748
2, 4	4	00: 54	F	741
3, 4	4	01: 09	F	742
4, 4	4	01: 24	F	739
1, 4	5	01: 39	F	730
2, 4	5	01: 54	F	728
3, 4	5	02: 09	F	730
4, 4	5	02: 24	F	728
1, 4	6	02: 39	F	728
2, 4	6	02: 54	F	728
3, 4	6	03: 09	F	730
4, 4	6	03: 24	F	723
1, 4	7	03: 39	F	724
2, 4	7	03: 54	F	727
3, 4	7	04: 09	F	730
4, 4	7	04: 24	F	734
1, 4	8	04: 39	F	736
2, 4	8	04: 54	F	737
3, 4	8	05: 09	F	742
4, 4	8	05: 24	F	747
1, 4	9	05: 39	F	754
2, 4	9	05: 54	F	758
3, 4	9	06: 09	F	764
4, 4	9	06: 24	F	770
1, 4	10	06: 39	F	776
2, 4	10	06: 54	F	782
3, 4	10	07: 09	F	788
4, 4	10	07: 24	F	800
1, 4	11	07: 39	F	800
2, 4	11	07: 54	F	804
3, 4	11	08: 09	F	944
4, 4	11	08: 24	F	814
1, 4	12	08: 39	F	836
2, 4	12	08: 54	F	824
3, 4	12	09: 09	F	825
4, 4	12	09: 24	F	826
1, 4	13	09: 39	F	826
2, 4	13	09: 54	F	824
3, 4	13	10: 09	F	820
4, 4	13	10: 24	F	820
1, 4	14	10: 39	F	814
2, 4	14	10: 54	F	814
3, 4	14	11: 09	F	806
4, 4	14	11: 24	F	804
1, 4	15	11: 39	F	798
2, 4	15	11: 54	F	796
3, 4	15	12: 09	F	790
4, 4	15	12: 24	F	788
1, 4	16	12: 39	F	784
2, 4	16	12: 54	F	780
3, 4	16	13: 09	F	770
4, 4	16	13: 24	F	774
1, 4	17	13: 39	F	767
2, 4	17	13: 54	F	762
3, 4	17	14: 09	F	755
4, 4	17	14: 24	F	754
1, 4	18	14: 39	F	755

PSNS015 STE#7 SmpI Rpt

2, 4	18	14: 54	F	756
3, 4	18	15: 09	F	756
4, 4	18	15: 24	F	759
1, 4	19	15: 39	F	754
2, 4	19	15: 54	F	762
3, 4	19	16: 09	F	766
4, 4	19	16: 24	F	764
1, 4	20	16: 39	F	772
2, 4	20	16: 54	F	776
3, 4	20	17: 09	F	788
4, 4	20	17: 24	F	796
1, 4	21	17: 39	F	791
2, 4	21	17: 54	F	804
3, 4	21	18: 09	F	810
4, 4	21	18: 24	F	814
1, 4	22	18: 39	F	824
2, 4	22	18: 54	F	833
3, 4	22	19: 09	F	829
4, 4	22	19: 24	F	835
1, 4	23	19: 39	F	864
2, 4	23	19: 54	F	835
3, 4	23	20: 09	F	834
4, 4	23	20: 24	F	834
1, 4	24	20: 39	F	838
2, 4	24	20: 54	F	834
3, 4	24	21: 09	F	833
4, 4	24	21: 24	F	840
		21: 24	PGM DONE	14-APR

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW

PSNS032 STE#7 SmpI Rpt

SAMPLER ID# 2483481595 10:09 15-APR-11

Hardware: B2 Software: 3.21

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS032"

SITE DESCRIPTION:

"PSNS032"

UNITS SELECTED:

LENGTH: ft

24, 1000 ml BTLS
23 ft SUCTION LINE
12 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 ml SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I /01= NONE
I /02= NONE
I /03= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 2483481595 10:09 15-APR-11
Hardware: B2 Software: 3.21
***** SAMPLING RESULTS *****

SITE: PSNS032
PROGRAM: PSNS032
Program Started at 11:49 SA 9-APR-11
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	LIQUID	COUNT TO

		11:49	PGM	DI	SABLED	
		TH 14-APR-11	-----			
		03:07	PGM	ENABLED		
1,4	1	03:07	E			596
2,4	1	03:21	F			593
3,4	1	03:36	F			605
4,4	1	03:51	F			598
1,4	2	04:06	F			606
2,4	2	04:21	F			607
3,4	2	04:36	F			606

PSNS032 STE#7 SmpI Rpt

4, 4	2	04: 51	F	612
1, 4	3	05: 06	F	610
2, 4	3	05: 21	F	618
3, 4	3	05: 36	F	648
4, 4	3	05: 51	F NL	*
1, 4	4	06: 06	F NL	*
2, 4	4	06: 21	F NL	*
3, 4	4	06: 36	F NL	*
4, 4	4	06: 51	F NL	*
1, 4	5	07: 06	F NL	*
2, 4	5	07: 21	F NL	*
3, 4	5	07: 36	F NL	*
4, 4	5	07: 51	F NL	*
1, 4	6	08: 06	F NL	*
2, 4	6	08: 21	F NL	*
3, 4	6	08: 36	F NL	*
4, 4	6	08: 51	F NL	*
1, 4	7	09: 06	F NL	*
2, 4	7	09: 21	F NL	*
3, 4	7	09: 36	F NL	*
4, 4	7	09: 51	F NL	*
1, 4	8	10: 06	F NL	*
2, 4	8	10: 21	F NL	*
3, 4	8	10: 36	F NL	*
4, 4	8	10: 51	F NL	*
1, 4	9	11: 06	F NL	*
2, 4	9	11: 21	F NL	*
3, 4	9	11: 36	F NL	*
4, 4	9	11: 51	F NL	*
1, 4	10	12: 06	F NL	*
2, 4	10	12: 21	F NL	*
3, 4	10	12: 36	F NL	*
4, 4	10	12: 51	F	1674
1, 4	11	13: 06	F	642
2, 4	11	13: 21	F	636
3, 4	11	13: 36	F	653
4, 4	11	13: 51	F	658
1, 4	12	14: 06	F	628
2, 4	12	14: 21	F	622
3, 4	12	14: 36	F	618
4, 4	12	14: 51	F	624
1, 4	13	15: 06	F	629
2, 4	13	15: 21	F	623
3, 4	13	15: 36	F	642
4, 4	13	15: 51	F	638
1, 4	14	16: 06	F	626
2, 4	14	16: 21	F	635
3, 4	14	16: 36	F	642
4, 4	14	16: 51	F	636
1, 4	15	17: 06	F	634
2, 4	15	17: 21	F	637
3, 4	15	17: 36	F	640
4, 4	15	17: 51	F NL	*
1, 4	16	18: 06	F NL	*
2, 4	16	18: 21	F NL	*
3, 4	16	18: 36	F NL	*
4, 4	16	18: 51	F NL	*
1, 4	17	19: 06	F NL	*
2, 4	17	19: 21	F NL	*
3, 4	17	19: 36	F NL	*
4, 4	17	19: 51	F NL	*
1, 4	18	20: 06	F NL	*
2, 4	18	20: 21	F NL	*

PSNS032 STE#7 SmpI Rpt

3, 4	18	20: 36	F	NL	*
4, 4	18	20: 51	F	NL	*
1, 4	19	21: 06	F	NL	*
2, 4	19	21: 21	F	NL	*
3, 4	19	21: 36	F	NL	*
4, 4	19	21: 51	F	NL	*
1, 4	20	22: 06	F	NL	*
2, 4	20	22: 21	F	NL	*
3, 4	20	22: 36	F	NL	*
4, 4	20	22: 51	F	NL	*
1, 4	21	23: 06	F	NL	*
2, 4	21	23: 21	F	NL	*
3, 4	21	23: 36	F	NL	*
4, 4	21	23: 51	F	NL	*
----- FR 15-APR-11 -----					
1, 4	22	00: 06	F	NL	*
2, 4	22	00: 21	F	NL	*
3, 4	22	00: 36	F	NL	*
4, 4	22	00: 51	F	NL	*
1, 4	23	01: 06	F		636
2, 4	23	01: 21	F		634
3, 4	23	01: 36	F		624
4, 4	23	01: 51	F		616
1, 4	24	02: 06	F		616
2, 4	24	02: 21	F		610
3, 4	24	02: 36	F		604
4, 4	24	02: 51	F		606
02: 52 PGM DONE 15-APR					

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW
 ERROR NL ==> NO LIQUID DETECTED!

SAMPLER ID# 2483481595 10:10 15-APR-11
 Hardware: B2 Software: 3.21
 MODULE: NONE
 Hardware: Software: 0.00
 ***** COMBINED RESULTS *****
 SITE: PSNS032
 PROGRAM: PSNS032
 Program Started at 11:49 SA 9-APR-11
 Nominal Sample Volume = 240 ml

MODULE: NONE

SAMPLER ID# 2483481595 10:10 15-APR-11
 Hardware: B2 Software: 3.21
 ***** COMBINED RESULTS *****
 SITE: PSNS032
 PROGRAM: PSNS032
 Program Started at 11:49 SA 9-APR-11
 Nominal Sample Volume = 240 ml
 FR-TEMP
 SAMPLE BOTTLE TIME C

PSNS032 STE#7 SmpI Rpt
NO FR-TEMPERATURE

PSNS096 STE#7 SmpI Rpt

SAMPLER ID# 3293179316 10:31 15-APR-11

Hardware: B2 Software: 3.26

***** PROGRAM SETTINGS *****

PROGRAM NAME:

"PSNS096"

SITE DESCRIPTION:

"PSNS096"

UNITS SELECTED:

LENGTH: ft

24, 1000 ml BTLS
22 ft SUCTION LINE
18 ft SUCTION HEAD
0 RINSES, 0 RETRIES

ONE-PART PROGRAM

PACING:
FLOW, EVERY
1 PULSES
SAMPLE AT START

DISTRIBUTION:
4 SAMPLES/BOTTLE

VOLUME:
240 ml SAMPLES

ENABLE:
NONE PROGRAMMED

ENABLE:
ONCE ENABLED,
STAY ENABLED
SAMPLE AT ENABLE

ENABLE:
0 PAUSE & RESUMES

NO DELAY TO START

LIQUID DETECT ON

PSNS096 STE#7 SmpI Rpt

NO RAIN GAGE

NO YSI SONDE

MASTER/SLAVE OFF
BTL FULL DETECT OFF
TIMED BACKLIGHT

EVENT MARK SENT
DURING PUMP CYCLE

PUMP COUNTS FOR
EACH PURGE CYCLE:
200 PRE-SAMPLE
AUTO POST-SAMPLE

I /01= NONE
I /02= NONE
I /03= NONE

0 ANALOG OUTPUTS

NO PERIODIC
SERIAL OUTPUT

NO DIALOUT
CONDITIONS SET

SAMPLER ID# 3293179316 10:32 15-APR-11
Hardware: B2 Software: 3.26
***** SAMPLING RESULTS *****
SITE: PSNS096
PROGRAM: PSNS096
Program Started at 10:13 SA 9-APR-11
Nominal Sample Volume = 240 ml

SAMPLE	BOTTLE	TIME	SOURCE	ERROR	LIQUID	COUNT TO

		10:13	PGM	DI	SABLED	
		TH 14-APR-11	-----			
		13:38	PGM	ENABLED		
1,4	1	13:38	E			624
2,4	1	13:52	F			623
3,4	1	14:07	F			624
4,4	1	14:22	F			620
1,4	2	14:37	F			625
2,4	2	14:52	F			629
3,4	2	15:07	F			626

PSNS096 STE#7 SmpI Rpt

4, 4	2	15: 22	F	625
1, 4	3	15: 37	F	629
2, 4	3	15: 52	F	636
3, 4	3	16: 07	F	630
4, 4	3	16: 22	F	632
1, 4	4	16: 37	F	637
2, 4	4	16: 52	F	636
3, 4	4	17: 07	F	648
4, 4	4	17: 22	F	644
1, 4	5	17: 37	F	646
2, 4	5	17: 52	F	654
3, 4	5	18: 07	F	665
4, 4	5	18: 22	F	665
1, 4	6	18: 37	F	678
2, 4	6	18: 52	F	679
3, 4	6	19: 07	F	683
4, 4	6	19: 22	F	684
1, 4	7	19: 37	F	684
2, 4	7	19: 52	F	689
3, 4	7	20: 07	F	689
4, 4	7	20: 22	F NL	*
1, 4	8	20: 37	F NL	*
2, 4	8	20: 52	F NL	*
3, 4	8	21: 07	F NL	*
4, 4	8	21: 22	F NL	*
1, 4	9	21: 37	F NL	*
2, 4	9	21: 52	F	686
3, 4	9	22: 07	F	683
4, 4	9	22: 22	F	684
1, 4	10	22: 37	F	683
2, 4	10	22: 52	F	672
3, 4	10	23: 07	F	668
4, 4	10	23: 22	F	665
1, 4	11	23: 37	F	660
2, 4	11	23: 52	F	655
-----FR 15-APR-11-----				
3, 4	11	00: 07	F	647
4, 4	11	00: 22	F	642
1, 4	12	00: 37	F	638
2, 4	12	00: 52	F	631
3, 4	12	01: 07	F	630
4, 4	12	01: 22	F	620
1, 4	13	01: 37	F	618
2, 4	13	01: 52	F	615
3, 4	13	02: 07	F	612
4, 4	13	02: 22	F	613
1, 4	14	02: 37	F	611
2, 4	14	02: 52	F	606
3, 4	14	03: 07	F	607
4, 4	14	03: 22	F	606
1, 4	15	03: 37	F	606
2, 4	15	03: 52	F	607
3, 4	15	04: 07	F	612
4, 4	15	04: 22	F	608
1, 4	16	04: 37	F	613
2, 4	16	04: 52	F	617
3, 4	16	05: 07	F	617
4, 4	16	05: 22	F	624
1, 4	17	05: 37	F	626
2, 4	17	05: 52	F	630
3, 4	17	06: 07	F	631
4, 4	17	06: 22	F	636
1, 4	18	06: 37	F	638

					PSNS096 STE#7 SmpI Rpt
2, 4	18	06: 52	F		643
3, 4	18	07: 07	F		648
4, 4	18	07: 22	F		659
1, 4	19	07: 37	F		660
2, 4	19	07: 52	F		666
3, 4	19	08: 07	F		667
4, 4	19	08: 22	F		672
1, 4	20	08: 37	F		678
2, 4	20	08: 52	F		678
3, 4	20	09: 07	F		683
4, 4	20	09: 22	F		696
1, 4	21	09: 37	F	NL	*
2, 4	21	09: 52	F	NL	*
3, 4	21	10: 07	F	NL	*
4, 4	21	10: 22	F		692
10: 27					MANUAL PAUSE
10: 27					PGM STOPPED 15-APR

SOURCE E ==> ENABLE
 SOURCE F ==> FLOW
 ERROR NL ==> NO LIQUID DETECTED!



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AREA FORECAST DISCUSSION

FXUS66 KSEW 130408
AFDSEW

AREA FORECAST DISCUSSION

NATIONAL WEATHER SERVICE SEATTLE WA
900 PM PDT TUE APR 12 2011

.SYNOPSIS...A SLOW MOVING FRONTAL SYSTEM OFFSHORE WILL THICKEN AND LOWER CLOUDS TONIGHT AND BRING A CHANCE OF RAIN LATE. MORNING RAIN ON THE COAST WILL SPREAD INLAND IN THE AFTERNOON. AN **UPPER LEVEL TROUGH** LATE WEDNESDAY WILL BRING COOL **UNSTABLE AIR** WITH SHOWERS WEDNESDAY NIGHT AND A CHANCE OF EVENING THUNDERSTORMS. ANOTHER UPPER LEVEL **TROUGH** WILL BRING SHOWERS ON THURSDAY.

&&

.SHORT TERM...CLOUDS HAVE SPREAD OVER WESTERN WASHINGTON BUT THERE IS NO RAIN YET. THE NEW **NAM** BRINGS LIGHT RAIN TO THE COAST BY 12Z AND SPREADS IT SLOWLY TO SEATTLE BY NOON OR SO. THIS SYSTEM DOES NOT SEEM TO HAVE MUCH PUNCH BUT EVERYWHERE SHOULD GET AT LEAST A LITTLE RAIN AT TIMES WEDNESDAY THROUGH THURSDAY. SOME DRYING FRIDAY AS **FLOW** ALOFT BECOMES WESTERLY. STILL PROBABLY PRETTY CLOUDY THOUGH. NO UPDATES PLANNED. BURKE

.LONG TERM...PREVIOUS DISCUSSION...12Z GFS/ECMWF ARE IN BETTER AGREEMENT THROUGH THE LONG TERM THAN THEIR PREVIOUS RUNS. RESIDUAL STRONG WEST **FLOW** ALOFT ACROSS THE AREA SATURDAY BECOMES MORE **NW** ON SUNDAY AND MONDAY AS AN **UPPER LEVEL RIDGE** BUILDS OUT OVER THE **NE** PACIFIC. THE AIR MASS LOOKS A LITTLE DRIER DURING THIS PERIOD BUT THE STRENGTH OF THE **FLOW** MEANS THE LOW CHANCE OF SHOWERS WILL HAVE TO CONTINUE. SHOWERS WILL BE MOST LIKELY ALONG COAST AND OVER THE CASCADES WITH PARTIAL SHIELDING OF THE PUGET SOUND REGION BY THE OLYMPICS. THERE MAY OR MAY NOT BE ANOTHER **SHORTWAVE TROUGH** EMBEDDED IN THE **FLOW** SUNDAY...MODELS DISAGREE ON THIS FEATURE. BROADBRUSH TYPICAL SPRING FORECAST OF **MOSTLY CLOUDY** WITH A CHANCE OF SHOWERS FORECAST WORKS. KAM

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.AVIATION...SOUTHWEST **FLOW** ALOFT OVER THE PACIFIC NORTHWEST THIS EVENING WILL CONTINUE THROUGH WEDNESDAY...AS A WEAK **FRONT** AND ITS UPPER **TROUGH** APPROACH THE REGION FROM THE WEST. THE **FRONT** WILL WEAKEN FURTHER AS IT MOVES INLAND WEDNESDAY...FOLLOWED BY THE UPPER **TROUGH** WEDNESDAY NIGHT. **MID** AND HIGH LEVEL **MOISTURE** OVER WESTERN WASHINGTON THIS EVENING WILL GRADUALLY LOWER TONIGHT...WITH THE AIR MASS GENERALLY MOIST WEDNESDAY MORNING THROUGH WEDNESDAY NIGHT.

VFR CONDITIONS PREVAIL ACROSS THE FORECAST AREA THIS EVENING WITH



CEILINGS MOSTLY AT OR ABOVE 10000 **FT**. CEILINGS WILL LOWER INTO THE 3500 TO 6000 **FT** RANGE TONIGHT AND WEDNESDAY MORNING WITH LIGHT RAIN SPREADING INLAND FROM THE COAST. CONDITIONS WILL DETERIORATE SOMEWHAT MORE TO A MIX OF **MVFR** AND **VFR** IN THE AFTERNOON.

KSEA...LIGHT **VARIABLE WIND** BECOMING SOUTHEAST 4-8 **KT** AROUND MIDNIGHT...THEN SOUTHWEST 8-14 **KT** AROUND NOON WEDNESDAY. MCDONNAL

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.MARINE...SOUTHEAST **FLOW** WILL PREVAIL TONIGHT AS A WEAK **FRONT** APPROACHES THE **COASTAL WATERS** FROM THE WEST. THIS FEATURE WILL PRODUCE **SMALL CRAFT ADVISORY** WINDS OVER THE **COASTAL WATERS** AND AT THE WEST ENTRANCE STRAIT OF JUAN DE FUCA TONIGHT AND WEDNESDAY MORNING. THE **FRONT** WILL MOVE INLAND WEDNESDAY AS IT WEAKENS FURTHER...BUT IT SHOULD HAVE ENOUGH STRENGTH YET TO GIVE SMALL CRAFT **ADVISORY** WINDS AT THE EAST ENTRANCE STRAIT WEDNESDAY MORNING.

HIGH PRESSURE WILL BUILD OVER THE REGION WEDNESDAY NIGHT. ANOTHER STRONGER **FRONT** WILL CROSS THE FORECAST AREA FROM THE WEST THURSDAY. MODELS SOLUTIONS CONTINUE TO DIFFER SIGNIFICANTLY WITH RESPECT TO THE WINDS THIS SYSTEM WILL PRODUCE. SOME RECENT RUNS OF THE UW 4KM WRF-GFS SUGGEST WE COULD HAVE **GALE** FORCE WINDS OVER THE COASTAL WATERS THURSDAY...WHILE THE **NAM** AND OTHER MODELS ARE GENERALLY WEAKER. THE FORECAST INDICATES 20 TO 30 **KT** FOR THE **COASTAL WATERS** AT THIS TIME.

ANOTHER SYSTEM WILL MOVE THROUGH THE FORECAST AREA FROM THE SOUTHWEST FRIDAY AND FRIDAY NIGHT...AND THIS SYSTEM DOES NOT LOOK VERY STRONG. **ONSHORE FLOW** WILL DEVELOP SATURDAY AND CONTINUE SUNDAY. MCDONNAL

&&

.SEW WATCHES/WARNINGS/ADVISORIES...
WA...

PZ...**SMALL CRAFT ADVISORY COASTAL WATERS** AND WEST ENTRANCE STRAIT OF JUAN DE FUCA TONIGHT AND WEDNESDAY MORNING.
.**SMALL CRAFT ADVISORY** EAST ENTRANCE STRAIT OF JUAN DE FUCA WEDNESDAY MORNING.

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National Oceanic and Atmospheric Administration
National Weather Service
Seattle Weather Forecast Office
7600 Sandpoint Way NE
Seattle, Washington 98115-6349

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Bremerton WA




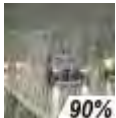




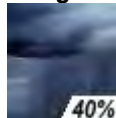


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NWS Seattle, WA
Point Forecast: Bremerton WA
 47.56°N 122.62°W (Elev. 0 ft)

[Mobile Weather Information](#) | [En Español](#)
Last Update: 3:17 pm PDT Apr 12, 2011
Forecast Valid: 11pm PDT Apr 12, 2011-6pm PDT Apr 19, 2011

Forecast at a Glance

Overnight	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday	Friday Night	Saturday	Saturday Night
								
Mostly Cloudy Lo 42 °F	Rain Hi 51 °F	Showers Likely Lo 40 °F	Showers Likely Hi 52 °F	Chance Showers Lo 38 °F	Chance Showers Hi 51 °F	Chance Showers Lo 40 °F	Partly Sunny Hi 54 °F	Mostly Cloudy Lo 38 °F

Detailed 7-day Forecast

Overnight: Mostly cloudy, with a low around 42. East wind at 8 mph becoming southwest.

Wednesday: Rain. High near 51. South southwest wind between 6 and 10 mph. Chance of precipitation is 90%.

Wednesday Night: Showers likely. Cloudy, with a low around 40. South southwest wind between 11 and 17 mph. Chance of precipitation is 70%.

Thursday: Showers likely. Cloudy, with a high near 52. South wind between 10 and 16 mph. Chance of precipitation is 70%.

Thursday Night: A 50 percent chance of showers. Mostly cloudy, with a low around 38. South southwest wind around 13 mph.

Friday: A 50 percent chance of showers. Mostly cloudy, with a high near 51.

Friday Night: A 40 percent chance of showers. Cloudy, with a low around 40.

Saturday: Partly sunny, with a high near 54.

Saturday Night: Mostly cloudy, with a low around 38.

Sunday: A chance of showers. Partly sunny, with a high near 54.

Sunday Night: A chance of showers. Mostly cloudy, with a low around 41.


Monday: A chance of showers. Partly sunny, with a high near 53.

Monday Night: A chance of showers. Mostly cloudy, with a low around 41.


Tuesday: A chance of showers. Partly sunny, with a high near 53.

Detailed Point Forecast [Move Down]

[Click Map for Forecast](#)
[Disclaimer](#)



Map data ©2011 Google -
 + Requested Location ■ Forecast Area
Lat/Lon: 47.56°N 122.62°W **Elevation:** 0 ft



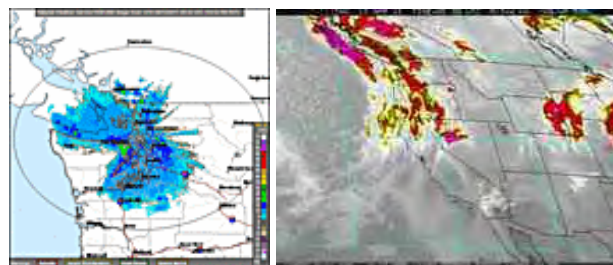
XML

Current Conditions [Move Up]

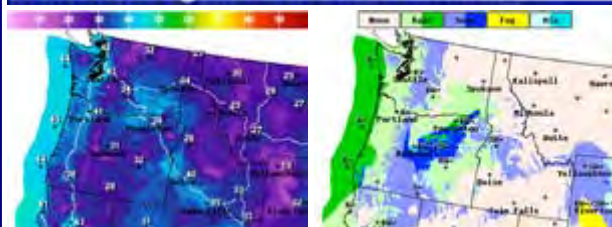
Bremerton, Bremerton National Airport
 Last Update on 12 Apr 21:55 PDT

Fair 41°F (5°C)	Humidity: 81 % Wind Speed: calm Barometer: 30.00 in (N/A mb) Dewpoint: 36°F (2°C) Visibility: 10.00 Miles More Local Wx: 3 Day History:
--	--

Radar and Satellite Images



National Digital Forecast Database



Additional Forecasts & Information

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Point Forecast: Bremerton WA
47.56N 122.62W (Elev. 0 ft)

Last Update: 3:17 pm PDT Apr 12, 2011

Hourly Weather Forecast Graph

[\[dashes/dots\]](#) [\[b/w\]](#) [\[hide menu\]](#)

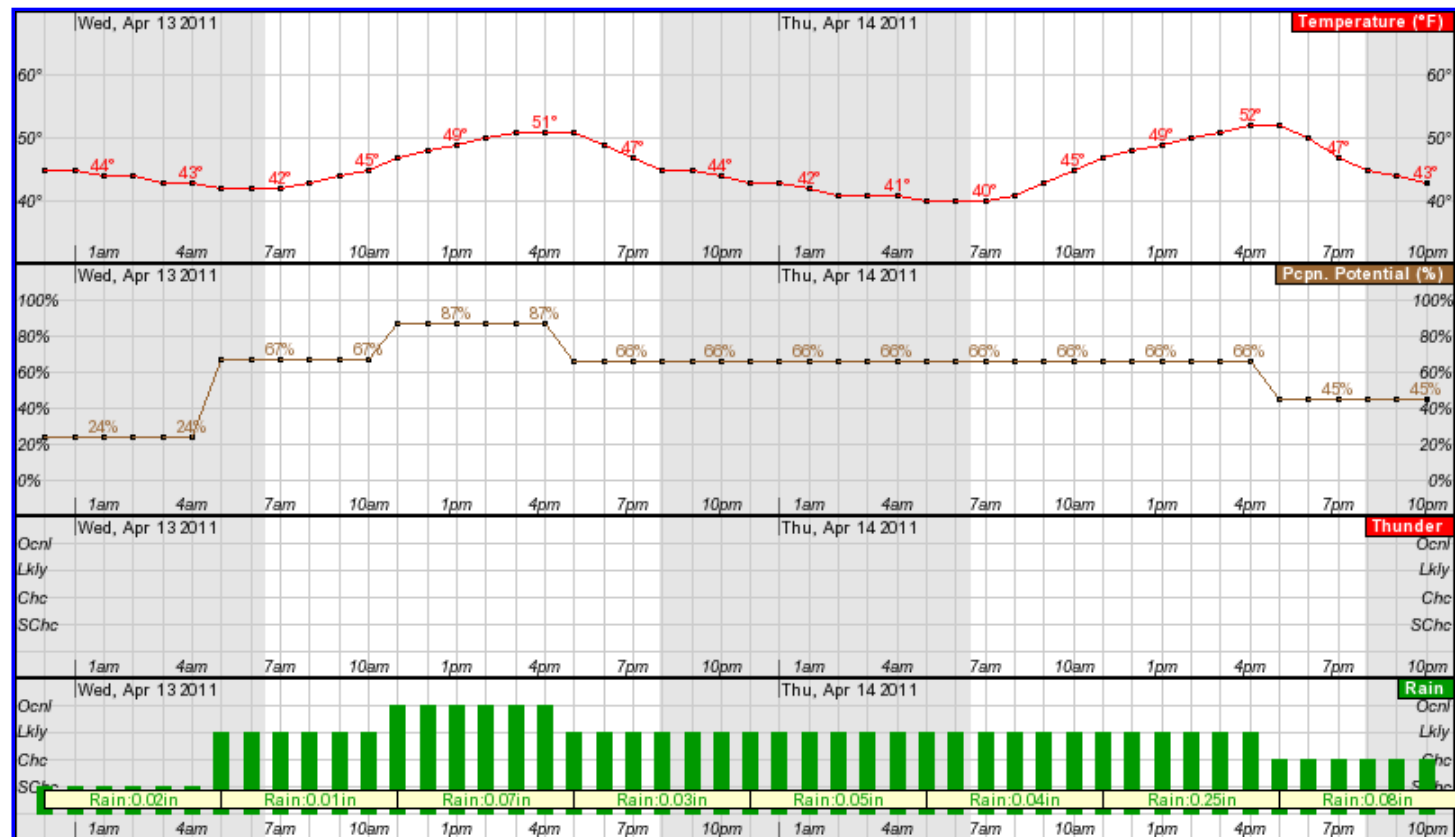
Weather Elements		Weather/Precipitation
<input checked="" type="checkbox"/> Temperature (°F)	<input type="checkbox"/> Surface Wind mph ▼	<input checked="" type="checkbox"/> Thunder
<input type="checkbox"/> Dewpoint (°F)	<input type="checkbox"/> Sky Coverage	<input checked="" type="checkbox"/> Rain
<input type="checkbox"/> Wind Chill (°F)	<input checked="" type="checkbox"/> Precipitation Potential	<input type="checkbox"/> Snow
	<input type="checkbox"/> Relative Humidity	<input type="checkbox"/> Freezing Rain
		<input type="checkbox"/> Sleet

48-Hour Period Starting: 11pm Tue, Apr 12 2011 ▼

Submit

Back 2 Days

Forward 2 Days





Point Forecast: Bremerton WA
47.56N 122.65W (Elev. 0 ft)

Search for: ☒ NWS ☐ All NOAA

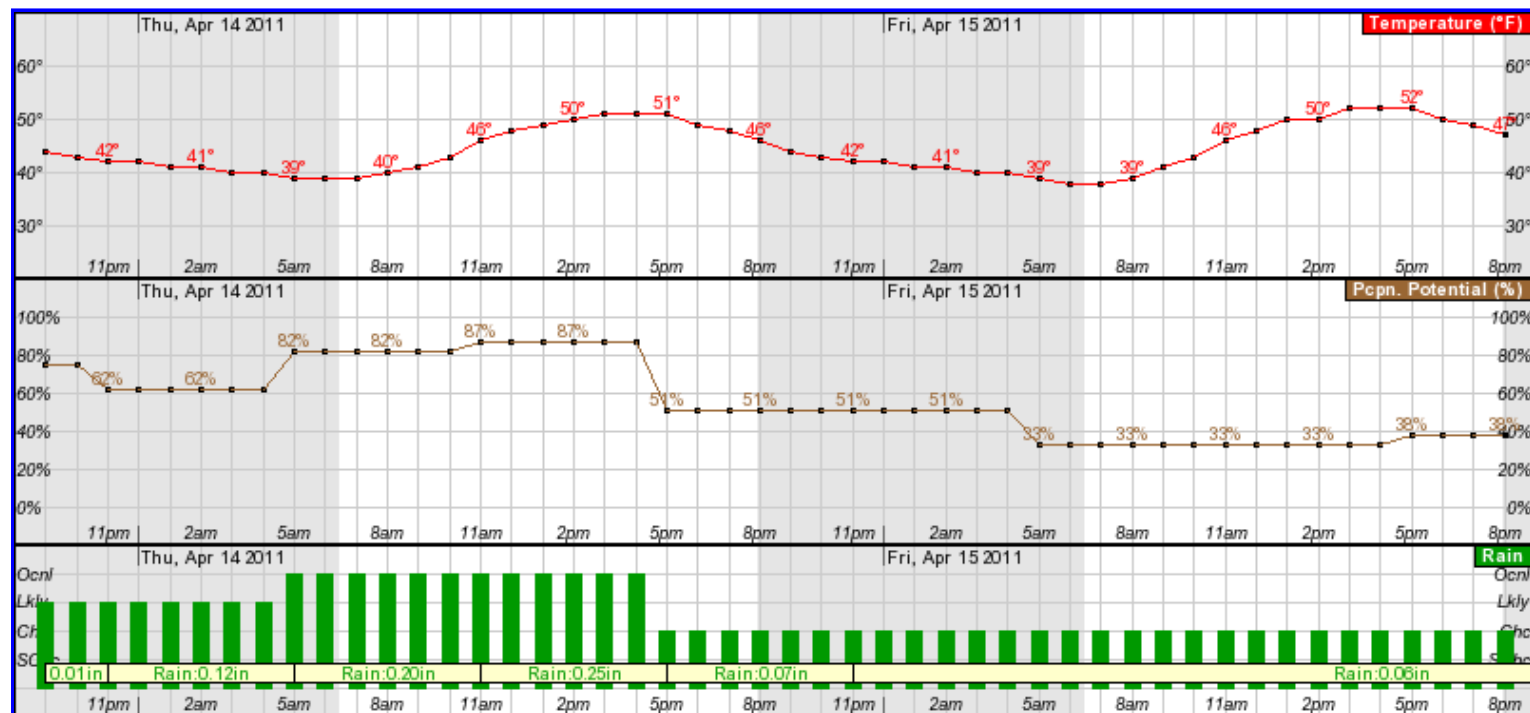
Last Update: 5:50 pm PDT Apr 13, 2011

Hourly Weather Forecast Graph

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Weather Elements		Weather/Precipitation
<input checked="" type="checkbox"/> Temperature (°F)	<input type="checkbox"/> Surface Wind <input type="text" value="mph"/>	<input type="checkbox"/> Thunder
<input type="checkbox"/> Dewpoint (°F)	<input type="checkbox"/> Sky Coverage	<input checked="" type="checkbox"/> Rain
<input type="checkbox"/> Wind Chill (°F)	<input checked="" type="checkbox"/> Precipitation Potential	<input type="checkbox"/> Snow
	<input type="checkbox"/> Relative Humidity	<input type="checkbox"/> Freezing Rain
		<input type="checkbox"/> Sleet

48-Hour Period Starting:



Thursday, April 14 at 1am
Temperature: 41 °F

Forecast For Lat/Lon: 47.5570/-122.6540 (Elev. 0 ft)
Bremerton WA

Custom Weather Forecast Table

	Tue Apr 12				Wed Apr 13				Thu Apr 14				Fri Apr 15			
Weather				Slight Chance Rain		Likely Rain	Rain	Likely Rain	Showers				Chance Rain	Showers		
Daily-Temp				High 54 Low 38			High 52 Low 43			High 50 Low 40				High 52 Low 39		
Chance of Precip	10%	10%	10%	25%	65%	85%	65%	65%	65%	65%	45%	45%	50%	50%	40%	40%
Precip	0.00"	0.00"	0.00"	0.02"	0.01"	0.07"	0.03"	0.05"	0.04"	0.25"	0.07"	0.01"	0.02"	0.01"	0.01"	0.01"
12-hr Snow Total	0"		0"		0"		0"		0"		0"		0"		0"	
6-Hour Temp	5am	11am	5pm	11pm	5am	11am	5pm	11pm	5am	11am	5pm	11pm	5am	11am	5pm	11pm
Cloudiness	39	48	54	47	44	49	52	44	41	46	50	43	40	47	52	46
Dewpoint	47%	59%	80%	81%	93%	95%	90%	91%	94%	96%	95%	55%	83%	83%	93%	93%
Relative Humidity	37	40	37	41	39	41	41	41	38	41	41	40	37	40	41	39
Wind	92%	73%	52%	80%	84%	75%	66%	87%	90%	81%	71%	88%	90%	78%	66%	77%
	SW	S	W	E	S	S	SW	S	S	S	SW	S	SE	N	S	W
	5	6	8	3	6	10	12	16	9	15	10	13	5	6	6	8
Snow Level (ft)	1610	1591	3074	3065	2440	1763	2281	1416	1332	1770	2754	1490	2140	2871	2834	2433

Seattle

NAM 0-84hr Forecast Meteogram for (122W, 47N)

