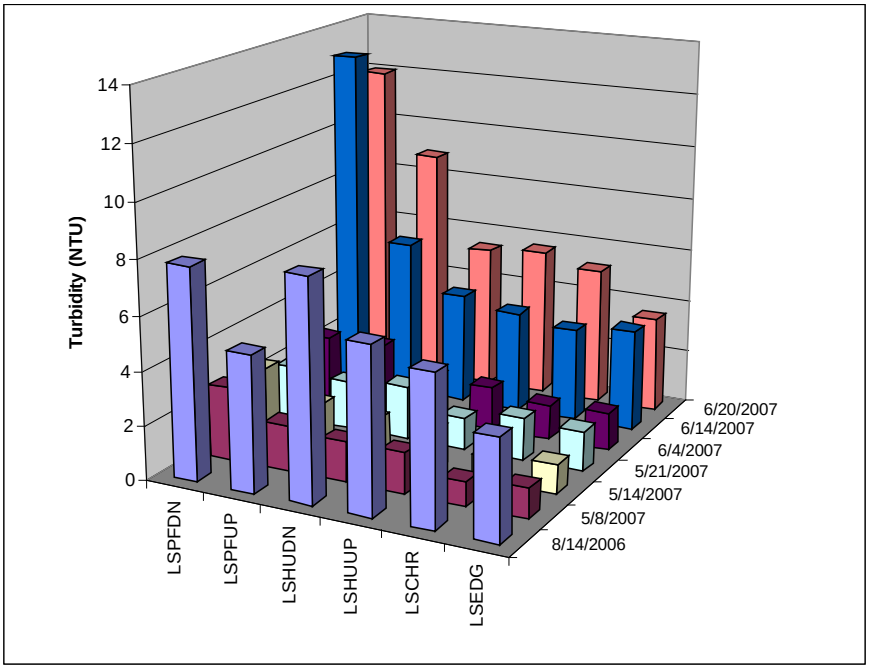
Water Quality Evaluation of the Lower Little Susitna River



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Acknowledgements

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Summary

Water quality sampling was conducted on the Little Susitna River in order to address Alaska Clean Water Actions Plan priorities. Plan priorities were to evaluate potential impacts to water quality related to recreational use of the lower river: from Houston to Cook Inlet. Water samples were collected weekly from late July through September of 2007 and from early May through June of 2008 at four sampling sites located upstream from Houston, downstream from Houston at Miller's Reach, upstream of the boat launch at the Public Use Facility, and downstream of the boat launch. Samples were analyzed for pH, specific conductivity, total aromatic hydrocarbons, turbidity, and dissolved oxygen. Water temperature loggers were placed at Miller's Reach and downstream of the Public Use Facility. The relative abundance of juvenile salmon was determined through catch rates at each sampling station during August and September of 2007. The results of water chemical analyses and temperature were compared against State Water Quality Standards. Measures of fish abundance were used to determine if there was a biotic response to any of the water chemistry measures.

Concentrations of total aromatic hydrocarbons exceeded the State Water Quality Standard of 10 μg/L below the Public Use Facility on one sampling date in August of 2007 and on five sampling dates above and below the Public Use Facility in 2008. Concentrations of hydrocarbons over 70 μg/L were recorded below the Public Use Site. Changes in hydrocarbon concentrations coincided with increased boat use during the sport fisheries consistent with other studies. These concentrations are higher in the Little Susitna River than have been reported for the Kenai River and are likely due to differences in stream flows. We also observed concentrations of total aromatic hydrocarbons above State Water Quality Standards at the sampling location upstream from Houston on two occasions. Based on variation in concentrations with slight adjustment in the sampling site and differences in hydrocarbon constituents, we believe that contamination is due to runoff from an adjacent undeveloped parking area.

Stream water turbidity increased above, and to a greater extent, below the Public Use Facility during concentrated use. Turbidity was greater than 5 NTU above background concentrations on one occasion in August of 2007 and greater than 5 NTU above background concentrations for three consecutive weeks during June of 2008.

Stream water temperatures downstream of the Public Use Facility exceeded 15°C on 50% of the days recorded from May through September of 2007. However, comparisons with other studies reveal that water temperatures in the Little Susitna River are similar to other cool water streams within the region.

We measured differences in the catch rate of juvenile coho salmon during August concurrent with differences in turbidity and not during September when turbidity was similar among sites. These data do not confirm a biotic response to changes in turbidity, but suggest that further evaluation is warranted.

Water quality sampling should be continued on the Little Susitna River near the Public Use Facility to evaluate the extent and duration of contamination and to evaluate changes in concentration relative to boat motor types.

Introduction

The Little Susitna River is located within South-central Alaska and flows from the Talkeetna Mountains adjacent to the communities of Wasilla and Houston. The river travels over 100 miles from Mint Glacier to Cook Inlet. The river flows through the Hatcher Pass State Recreation Area, the Nancy Lake State Recreation Area and the Susitna Flats State Game Refuge. The Little Susitna River is one of the rivers managed under the Susitna Area Recreational Rivers Management Plan. The river supports a highly popular salmon and trout fishery as well as recreational non-motorized and motorized boating. There is a relatively high degree of residential development between Edgerton Park Road and Schrock Road, adjacent to the cities of Wasilla and Houston, resulting in bank and riparian modifications (Davis and Davis 2007).

Primary use of the Little Susitna River is related to the salmon sport fishery. Access is limited to undeveloped boat launches near Houston (River Mile 62) and at the Public Use Facility (River Mile 25). In 2007, over 11,000 anglers accessed the Little Susitna River at the Public Use Facility during the Chinook and coho salmon sport fisheries.

The high degree of boat-accessed fishing, particularly near the Public Use Facility has raised concerns over potential impacts to water quality. Stream water turbidity appears to increase in the lower river during the sport fishery, which was confirmed by sampling conducted in 2006 and 2007 (Davis and Davis 2007). Intensive boat use on the Kenai River and within Big Lake has resulted in concentrations of hydrocarbons within the water column that exceed State Water Quality Standards (Oasis 2006, Oasis 2008).

The evaluation of potential impacts to water quality within Alaska is evaluated and prioritized through the Alaska Clean Water Actions Plan (ACWA). This plan is developed through the coordination among the state resources agencies including the Department of Environmental Conservation, the Department of Fish and Game, and the Department of Natural Resources. Based upon preliminary data, the state developed ACWA priorities for the Little Susitna River. These included intensive monitoring of the lower river (from Houston to Cook Inlet) for water quality parameters related to recreational use. Parameters included turbidity, dissolved oxygen, temperature, and hydrocarbons.

This study was developed and implemented to address these ACWA priorities. Stream water quality sampling was conducted at 4 locations. Two locations bracketed potential impacts surrounding the city of Houston, and two locations bracketed potential impacts near the Public Use Facility. Water quality parameters included hydrocarbons, water temperature, turbidity, pH, specific conductivity, and dissolved oxygen. These chemical and physical measures were accompanied by measures of the fish community. Data were collected during the fall of 2007 and the spring of 2008.

Methods

Water samples were collected from the Little Susitna River above and below locations where there is consistent boat use (Table 1). Sampling locations were located near the Park's Highway upstream and downstream at Miller's reach; and above and below the Public Use Facility. Samples were collected weekly on a Saturday or Sunday between 12:00 and 16:00 from July 29, 2007 through September 16, 2007, and weekly from May 10 through June 29, 2008. Samples were analyzed for total aromatic hydrocarbons (TAH) (consisting of benzene, toluene, ethyl benzene, and xylene (BTEX)), dissolved oxygen, pH, specific conductivity, and turbidity (see the Sampling Plan and QAPP in Appendix B for detailed descriptions of sample collection and processing). Stream water temperature was recorded on each sampling date and measured continuously (one hour or 15 minute intervals) from data loggers (HOBO Stowaway or Water Temp Pro) located at Miller's Reach and below the Public Use Facility.

On each sampling date we recorded the number of trailers and vehicles parked at the Miller's Reach launch near Houston. We recorded the number of boats seen during sample collection at each site and the type of motor when possible (2-cycle or 4-cycle). We obtained the number of anglers using the Public Use Facility launch from records kept by the Alaska Division of Parks and Recreation at the entry station for 2007.

Juvenile fish were sampled at each sampling location using six baited (commercial salmon roe) minnow traps at each site on August 14 and September 16, 2007. Juvenile fish were identified and measured to fork length, observed for any deformities, eroded fins, lesions, or tumors (DELT anomalies) and released on site.

Table 1. Location and description of water quality sampling locations.

Site Name	Site Description	Latitude	Longitude	River Mile
LSHUUP	Upstream of Houston at the ADFG Weir Site	61° 37' 30.3"	149° 46' 57.5"	64
LSHUDN	Downstream of Houston at the Miller's Reach Boat Launch	61° 37' 16.6"	149° 50' 57.8"	59
LSPFUP	1.0 km upstream of the Public Use Site	61° 26' 29.8"	150° 09' 35.5"	25.5
LSPFDN	0.5 km downstream of the Public Use Site	61° 26' 07.4"	150° 10' 21.8"	24.8
LSPFDNX	LSPFDN replicate, 0.5 km downstream from Public Use Site	61° 26' 07.4"	150° 10' 21.8"	24.8

Results

Quality Assurance Objectives

The precisions of total aromatic hydrocarbon measures, or the agreement between replicates, met project objectives on 9 of the 15 sampling dates. Agreement between replicates occurred on all dates when concentrations were below detection limits. The poorest measure of precision was due to a difference of 3.15μg/L, when the sample value was 5.25 μg/L and the replicate 2.10 μg/L. The largest difference between samples was

19.4 μg/L, when the sample value was 75.20 μg/L, and the replicate was 55.80 μg/L. Both sample and replicate values are shown in Figures 1 and 4.

Precision estimates are not reported in other studies for comparisons. Oasis Environmental, in hydrocarbon studies of the Kenai River and Big Lake, reports precision measures when concentrations exceed 10 times detection limits (Oasis 2008, Oasis 2006), which did not occur in those studies. Using the sum of BTEX detection limits, the TAH detection limit for this study is 2.5 μg/L. Therefore, using the standard developed by Oasis, precision would be reported for values over 25 μg/L. TAH concentrations exceeded this value on two sampling dates. Precision of samples on these dates exceeded objectives on one of these dates. Precision also is not reported by the Kenai Watershed Forum (2008). However, differences between duplicates appear to be similar to data presented here based on personal communication with Jim Czarneski (Kenai Watershed Forum). We believe that differences among replicates are due, at least in part, to variability in concentration throughout the water column. It appears likely that hydrophobic hydrocarbon molecules would be unevenly distributed through the water column. If this is the case, the average of multiple samples may be a better measure of TAH concentrations.

Stream water turbidity measures met precision objectives on all but four sampling dates. The maximum difference between turbidity replicates was 2.5 NTU when concentrations were 8.0 and 5.5 NTU for sample and replicate measures, respectively.

Hydrocarbons

The concentration of TAH was below detection limits on most sampling dates at most location throughout the fall sampling. However, TAH were detected from samples collected on two sampling dates at sites located above and below the Public Use Facility boat launch and parking area on July 29 and August 19 of 2007 (Figure 1 and Appendix A). The state water quality standard for TAH is 10 μg/L (18 AAC 70.020 (b)(5)(A)(iii)). This concentration was exceeded on August 19 below the Public Use Facility when concentrations of 10.17 μg/L were recorded. However, results from a replicate sample taken at the same time and location were 8.15 μg/L resulting in an average of 9.16 μg/L.

High concentrations occurred during the coho sport fishery and coincided with times of heavy use as indicated by the number of registered anglers (Figure 2) and our observations of boat use. High use also was recorded on August 5 and August 12, 2007; however, concentrations of TAH were below detection limits. Differences among sampling dates may be related to differences in stream discharge, with higher flows diluting hydrocarbon inputs and resulting in lower concentrations. Stream discharge was not measured at the sampling locations; however, discharge recorded at the USGS gauging station (Station 15290000) located 70 miles upstream increased from 260 cfs on July 29 to 648 cfs on August 5, decreased to 415 cfs on August 12 and then to 296 cfs on August 19 (Figure 3).

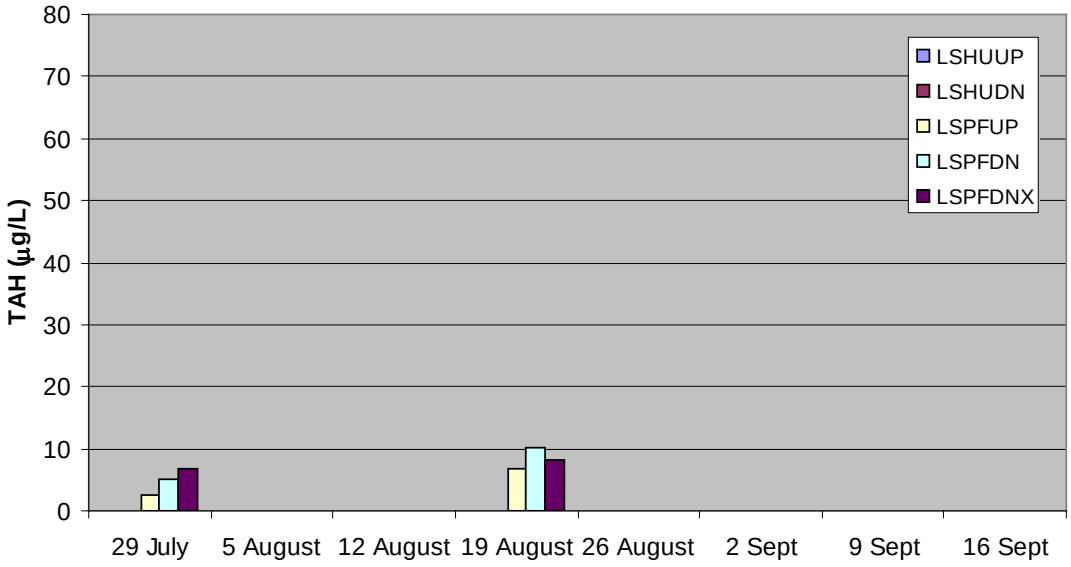

Figure 1. Concentrations of total aromatic hydrocarbons at the Little Susitna sampling stations in 2007. LSHUUP is upstream of Houston at or near the ADFG weir, LSHUDN is below Houston at the Miller's Reach undeveloped launch, LSPFUP is approximately 1.0 km upstream of the Public Use Facility, LSPFDN is 0.5 km downstream from the Public use boat launch, and LSPFDNX is a replicate of the LSPFDN sample.

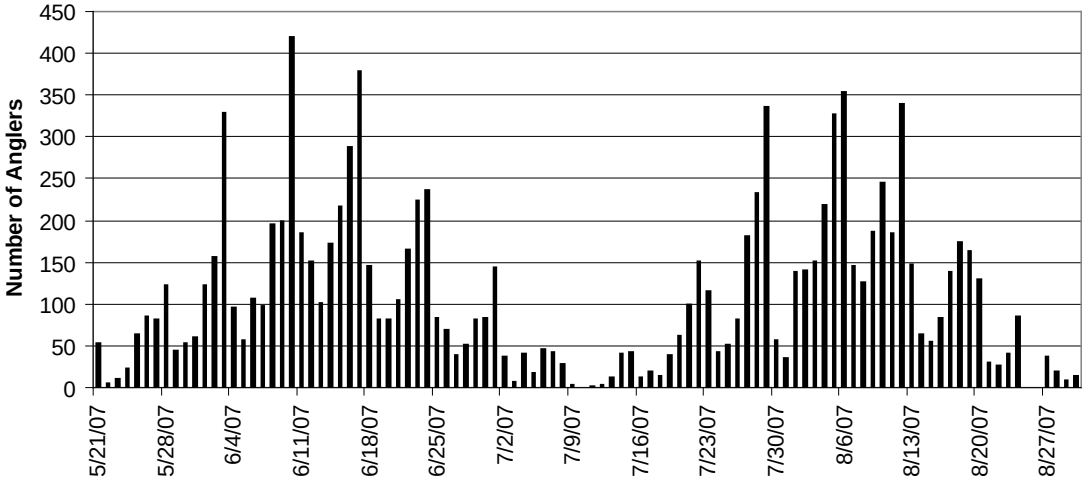

Figure 2. Number of anglers recorded at the entrance to the Public Use Facility campground and boat launch in 2007.

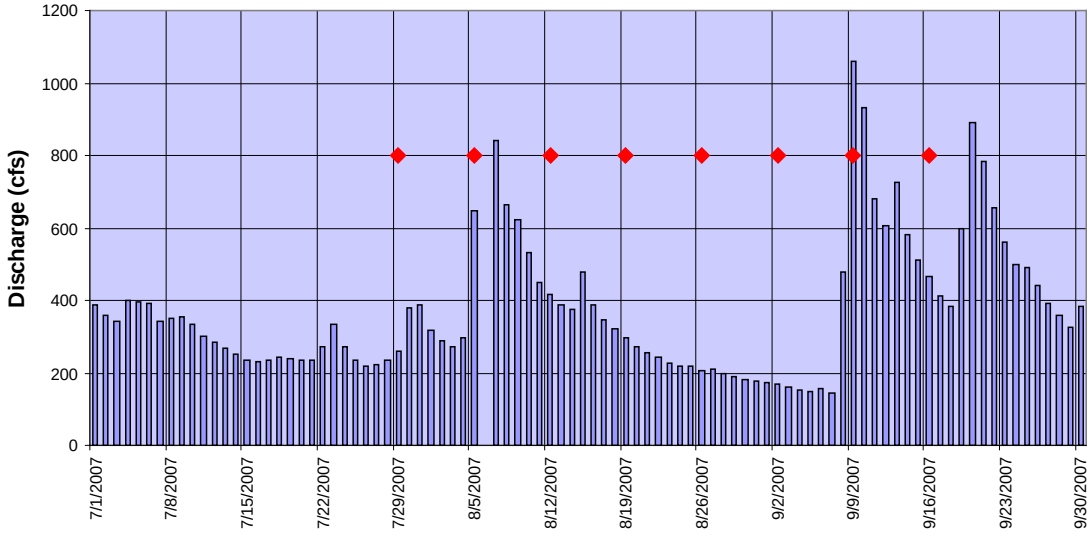

Figure 3. Sampling dates (red triangles) relative to discharge recorded at the USGS sampling station.

Spring 2008 sampling was conducted weekly on weekends from May 10 through June 29. Concentrations of TAH were below detection limits on May 10, above detection limits at one or more sites on the remaining sampling dates, and exceeded water quality standards at one or more sites on 5 of the 8 sampling dates (Figure 4). Concentrations exceeded water quality standards at sampling locations above and below the Public Use Facility; with concentrations slightly higher at the downstream location. Angler use data collected at the entrance booth are not yet available for 2008; however, high concentrations occurred during heavy use periods through the Chinook salmon sport fishery as recorded in May and June of 2007 (Figure 2). The number of trailers in the boat launch parking area was the best indication of use that we recorded. Highest use based on this measure was from June 1 through June 21 (Figure 5). Concentrations on June 21 were below detection limits even though indicators of use remained high. The differences in concentrations could not be explained entirely by differences in stream flow (Figure 6). In 2008 stream flows were measured at the sampling station 1.0 km upstream from the Public Use boat launch (except for June 29 due to equipment failure). Stream flows were 386 cfs on June 1, 465 cfs on June 8, 594 on June 15, and 404 on June 21. If the input of hydrocarbons were constant among these dates, concentrations should have been higher on June 21 as flows decreased.

Concentrations of TAH also exceeded water quality standards at the reference site located upstream from Houston on three sampling dates in 2008. These high concentrations are not related to boat use and we hypothesize that they are due to runoff from an adjacent undeveloped parking area. This area of the stream is closed to sport fishing for salmon and there is little or no boat traffic. River access in this area is limited, and in 2007 we initiated sampling from a gravel pad used by the Alaska Department of Fish and Game (ADFG) to install and maintain a salmon counting weir. However, sampling was moved upstream approximately 50 m once the weir was installed. In 2008 we shifted our sampling station back to the ADFG weir site. Upon receipt of initial water sample results

showing hydrocarbons within our samples, we suspected contamination from runoff and shifted our sampling location back upstream from June 15 through June 29. The constituents within samples at the upstream Houston site are different from those collected near the Public Use Facility. At the upstream Houston site, the dominant constituent are the total xylenes; while at the Public Use Site, toluene is the major component.

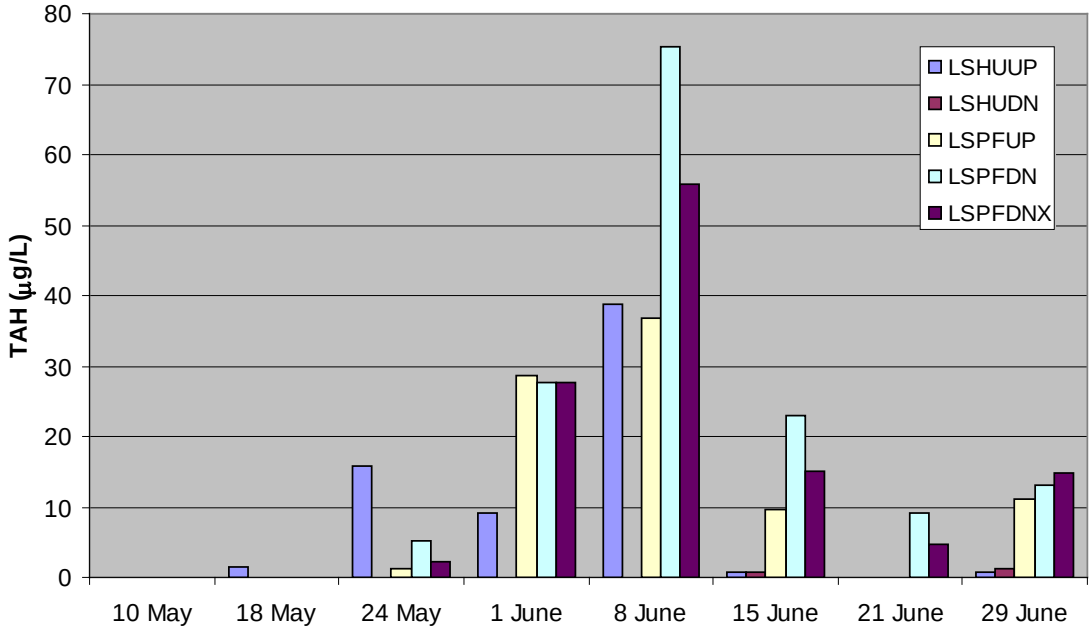

Figure 4. Concentrations of total aromatic hydrocarbons at the Little Susitna sampling stations in May and June of 2008.

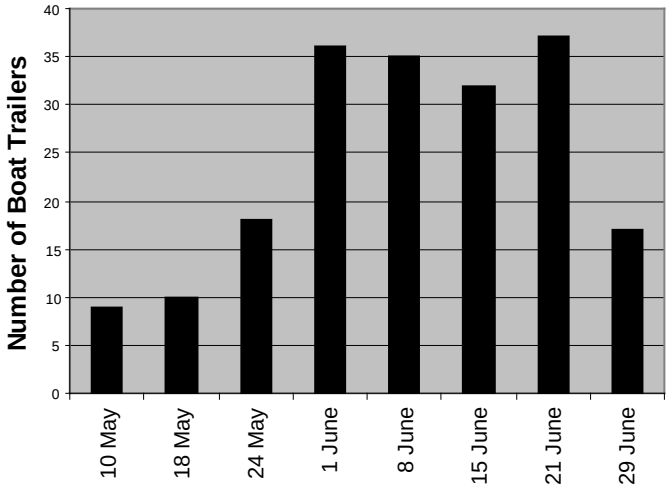

Figure 5. Number of boat trailers at the boat launch.

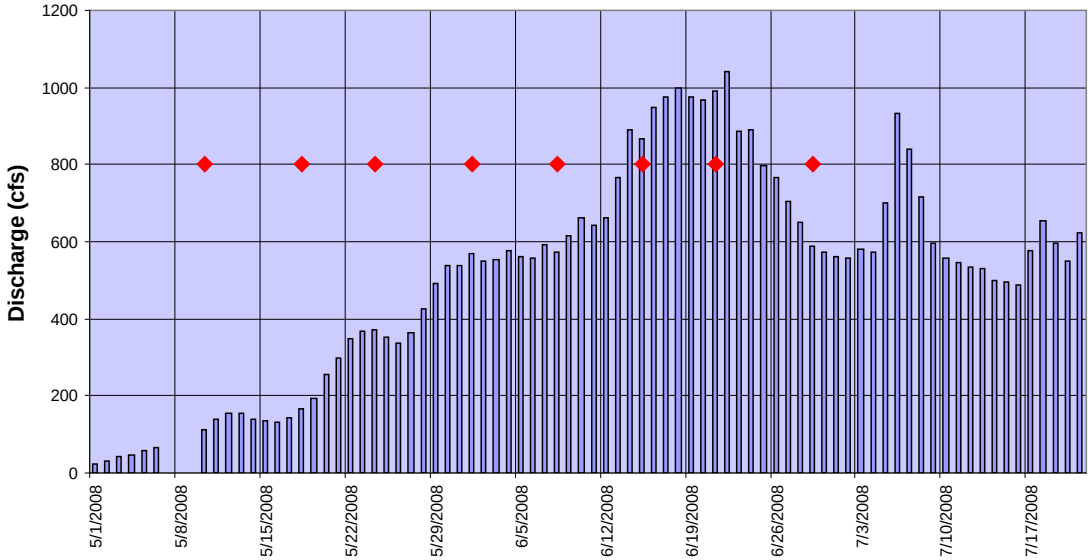

Figure 6. Water sampling dates (red diamonds) relative to stream flow at the USGS sampling station.

Turbidity

There is a visible increase in stream water turbidity during heavy boat use of the lower Little Susitna River throughout the coho and Chinook sport fisheries. We did not collect a sufficient number of samples to assess impairment as defined in Alaska's Draft Integrated Water Quality Monitoring and Assessment Report (ADEC 2008), which requires 20 samples collected during a 3 week period. Background turbidity was established from samples collected above and below the Park's Highway near Houston. These sites are located 30 miles away, but are the closest road-accessible locations upstream of the area potentially impacted by human activity. There are 5 tributaries entering the Little Susitna River between Houston and the Public Use Facility. These tributaries drain extensive wetland areas and are of low slope and are not expected to cause an increase in turbidity. Average turbidity from samples collected weekly from May 2007 through June 2008, excluding storm flows were 3.0 and 3.4 for sites located above and below Houston, respectively (Figures 7 and 8) (see Davis and Davis 2007 and Appendix A for spring 2007 data). During early May and late September of 2007, when there was little activity on the river, there were no differences in turbidity between the Houston sites and the sites near the Public Use Facility. During heavy use periods in August of 2007, and May and June of 2008, turbidity increased above and below the Public Use Facility relative to the upstream reference sites. The highest increase during August of 2007 occurred on the 12th when turbidity increased to 10 NTU downstream from the Public Use Facility. This is 7 NTU above average upstream values and 6 NTU above samples collected upstream on the same day (Table 2). Turbidity was similar among sites in September following the coho fishery, except for September 9, when large increases in turbidity were recorded near Houston following a storm event, but had not reached the lower Little Susitna in the time it took to drive to the sampling sites.

We measured larger differences in turbidity between reference and sites located near the Public Use Facility during the spring of 2008. The increase in turbidity coincided with increased boat use of the river. Early in the Chinook sport fishery in May and June, fishing activity was primarily downstream of the launch and increased turbidity was recorded at the downstream sampling site; however, as fishing followed the Chinook salmon upstream, turbidity began to increase upstream as well. As activity tapered off by the end of June, turbidity was similar between reference and lower-river sampling stations. Figure 9 shows the daily variability in turbidity during heavy use on July 26 and 27 of 2007 above and below the Public Use Facility. Turbidity at both sites is at 0 from midnight to approximately 05:00. Turbidity then increases through the day as use of the river increases[1].

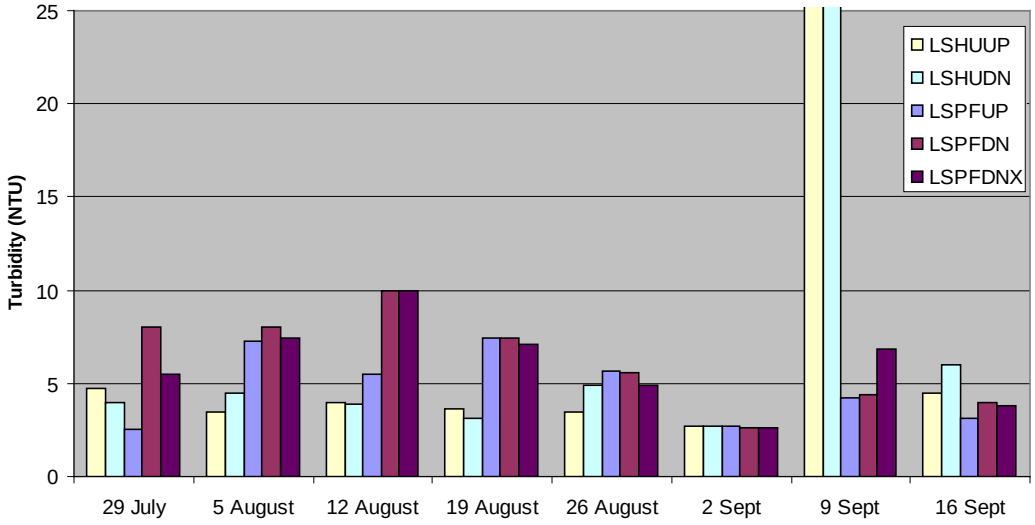

Figure 7. Stream water turbidity in 2007 at the Little Susitna sampling stations.

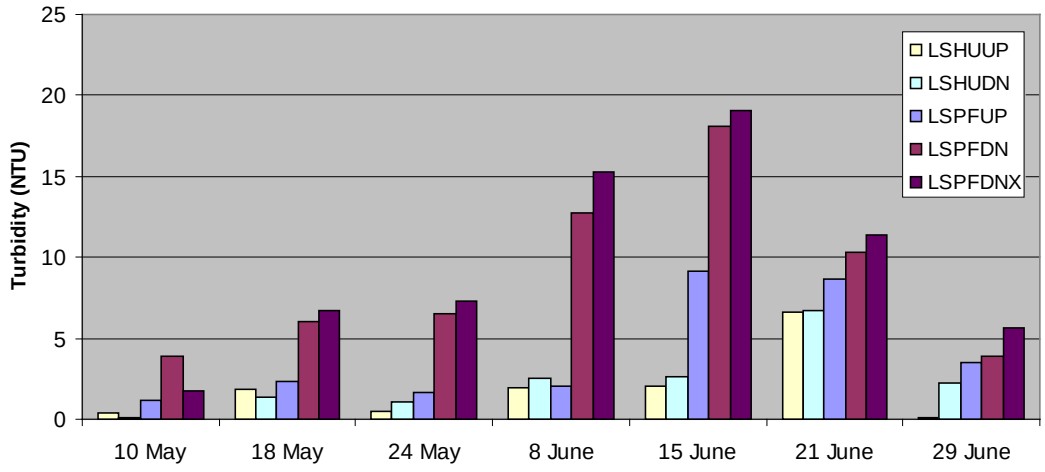

Figure 8. Stream water turbidity in the spring of 2008 at the Little Susitna sampling stations.

[1] Data collected by Hach Sondes hourly. These methods are not part of the study design and are not described within the approved QAPP for 2007/2008 but are included for data collection in 2008/2009.

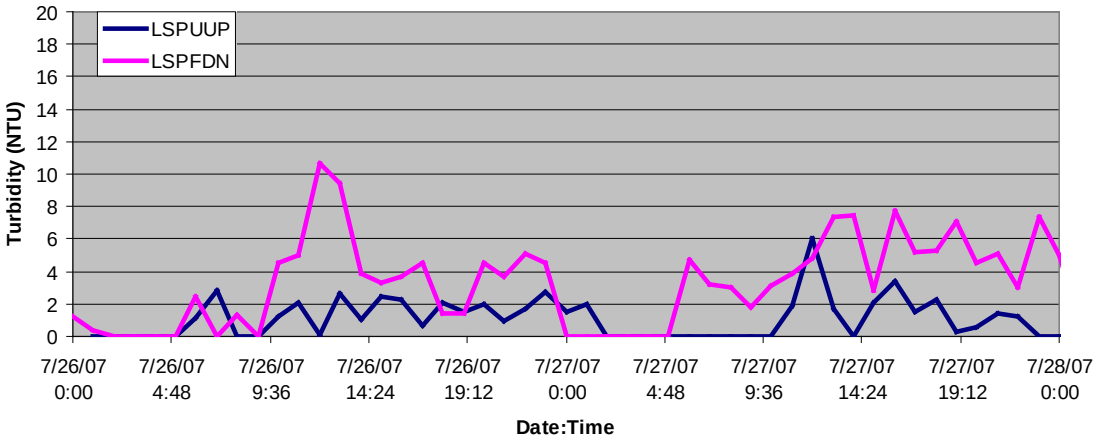

Figure 9. Daily variability in turbidity at the lower river sampling stations during heavy use in July of 2007.

Maximum turbidity recorded in the spring of 2008 was 18 NTU at the site below the Public Use Facility on June 15, which was 16 NTU above background. Turbidity at the reference site and above and below the Public Use Facility for each sampling date is shown in Table 2. There is a greater increase in turbidity below the Public Use Facility compared to the reference site than there is above. Differences were greater in the spring of 2008 than during the fall of 2007. Turbidity was 6 or more NTU above background at this site for three consecutive weeks in June of 2008.

Table 2. Turbidity (NTU) at the upstream reference and sites located above and below the Public Use Facility and the difference among sites for each sampling date.

Date	LSHUUP	LSPFUP	LSPFDN	LSHUUP to LSPFUP	LSHUUP to LSPFDN
7/29/2007	4.7	3.3	7.2	-1.4	2.5
8/5/2007	3.5	7.3	8	3.8	4.5
8/12/2007	4	5.5	10	1.5	6
8/19/2007	3.6	7.4	7.4	3.8	3.8
8/26/2007	3.5	5.7	5.6	2.2	2.1
9/2/2007	2.7	2.7	2.6	0	-0.1
9/9/2007	34	4.2	4.4	-29.8	-29.6
9/17/2007	4.5	3.1	4	-1.4	-0.5
5/10/2008	0.38	1.18	3.89	0.8	3.51
5/18/2008	1.84	2.31	6.04	0.47	4.2
5/24/2008	0.47	1.62	6.47	1.15	6
6/8/2008	1.96	2.03	12.7	0.07	10.74
6/15/2008	2.07	9.17	18.1	7.1	16.03
6/21/2008	6.59	8.63	10.3	2.04	3.71
6/29/2008	0.12	3.54	3.89	3.42	3.77

Water Chemistry and Temperature

The results of sample analyses for pH, specific conductivity, and dissolved oxygen are provided in Appendix A. Stream water pH was near neutral on most sampling dates, ranging from 7.1 to 7.4. However, pH dropped to 6.8 during storm flows at Houston on September 9, 2007. Specific conductivity ranged from 60 to 90 µS/cm. Dissolved oxygen was near saturation on all sampling dates.

Stream water temperatures ranged from 6 to 20°C from May through September of 2007 at the Public Use Facility (Figure 10) and from 4 to 16°C at Miller's Reach (Figure 11). Water temperatures in the Little Susitna River are poorly correlated with regional air temperatures with low r^2 values for regressions between daily maximum stream temperatures and daily maximum air temperatures (Table 3). State water quality standards are 15°C for migration and rearing of anadromous salmon, and 13°C for spawning and incubation (11 AAC 70.070 (b)(10)(A)(iii)). Water temperatures in the lower river often exceed these temperatures, while temperatures near Houston only exceeded 13°C on 13 days in 2007.

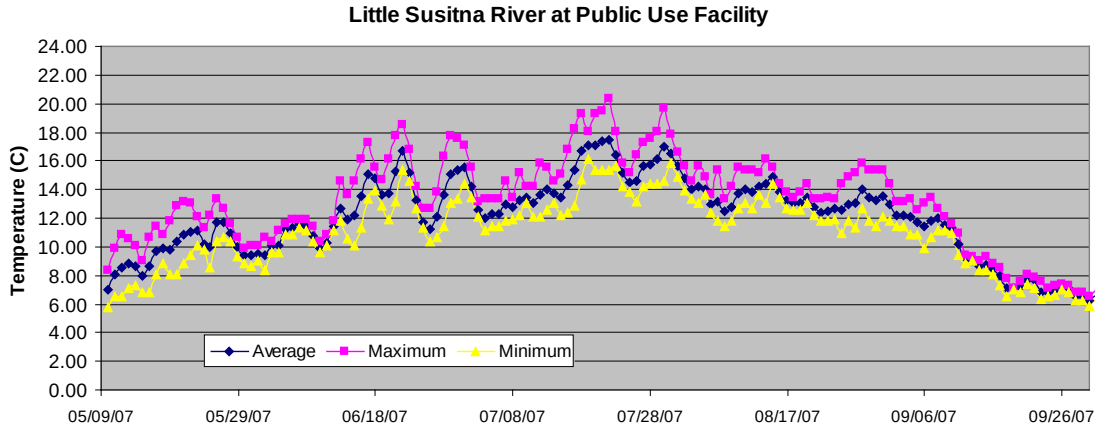

Figure 10. Daily temperature statistics from data recorded below the Public Use Facility.

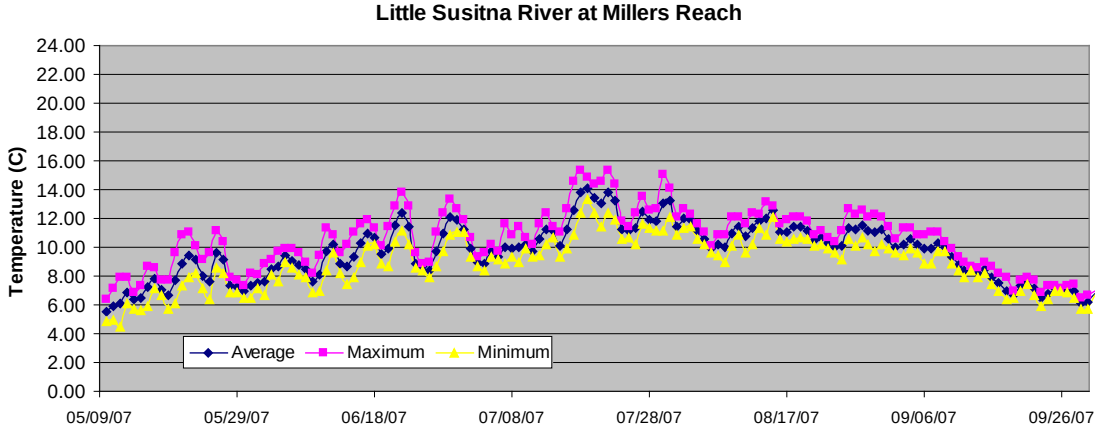

Figure 11. Daily temperature statistics from data recorded at Miller's Reach near the city of Houston.

Table 3. Stream water temperature statistics for two locations on the Little Susitna River for May through September of 2007 and May and June of 2008. Cumulative degree days are the sum of daily average temperatures. Regression coefficient and regression r^2 is for the relationship between maximum daily air temperature and maximum daily water temperature.

	Public Use Facility 2007	Millers Reach 2007	Public Use Facility 2008	Millers Reach 2008
Season Maximum	20.31	15.35	14.39	10.58
Maximum Range	5.35	3.87	5.50	3.57
Total Days	157	157	51	51
Days Max Temp >13	87	13	14	0
Days Max Temp >15	47	3	0	0
Days Max Temp >20	1	0	0	0
June Cumulative Degree Days	380	292	313	247
July Cumulative Degree Days	457	353	N/A	N/A
August Cumulative Degree Days	416	342	N/A	N/A
September Cumulative Degree Days	266	245	N/A	N/A
Regression Coefficient	0.54	0.37	N/A	N/A
Regression r^2	0.51	0.45	N/A	N/A

Juvenile Fish

A total of 333 juvenile salmonids were captured at the four sampling stations in August of 2007 and 67 in September. Juvenile coho salmon dominated the catch, with juvenile Chinook salmon, Dolly Varden char, and rainbow trout also present (Table 4). We observed no tumors or lesions on any of the fish. Only a few fish had eroded dorsal and anal fins; however, these injuries could have occurred within the traps. Catch rates of coho salmon were greatest near Miller's Reach and upstream of the Public Use facility in August. In September catch rates of coho salmon were lowest upstream of Houston and similar among the remaining 3 sites. Chinook salmon were most abundant at Miller's Reach in both August and September. Rainbow trout were captured at all locations, but Dolly Varden were not captured in the lower river. Coho and Chinook salmon were composed primarily of a single age class in both August and September based upon length distribution (Figures 12 and 13).

Table 4. Total salmonid catch and catch per trap for each sampling station in August and September of 2007.

August 13					
Total Catch	**Coho**	**Chinook**	**DV**	**Rainbow**	**Total Salmonids**
LSHUUP	32	2	3	1	38
LSHUDN	106	19	1	0	126
LSPFUP	131	1	0	3	135
LSPFDN	33	1	0	0	34
Catch/Trap	**Coho**	**Chinook**	**DV**	**Rainbow**	**Total Salmonids**
LSHUUP	5.3	0.3	0.5	0.2	6.3
LSHUDN	17.7	3.2	0.2	0.0	21.0
LSPFUP	21.8	0.2	0.0	0.5	22.5
LSPFDN	5.5	0.2	0.0	0.0	5.7
September 16					
Total Catch	**Coho**	**Chinook**	**DV**	**Rainbow**	**Total Salmonids**
LSHUUP	4	1	0	2	7
LSHUDN	13	11	2	2	28
LSPFUP	15	0	0	1	16
LSPFDN	14	1	0	1	16
Catch/Trap	**Coho**	**Chinook**	**DV**	**Rainbow**	**Total Salmonids**
LSHUUP	0.7	0.2	0.0	0.3	1.2
LSHUDN	2.2	1.8	0.3	0.3	4.7
LSPFUP	2.5	0.0	0.0	0.2	2.7
LSPFDN	2.3	0.2	0.0	0.2	2.7

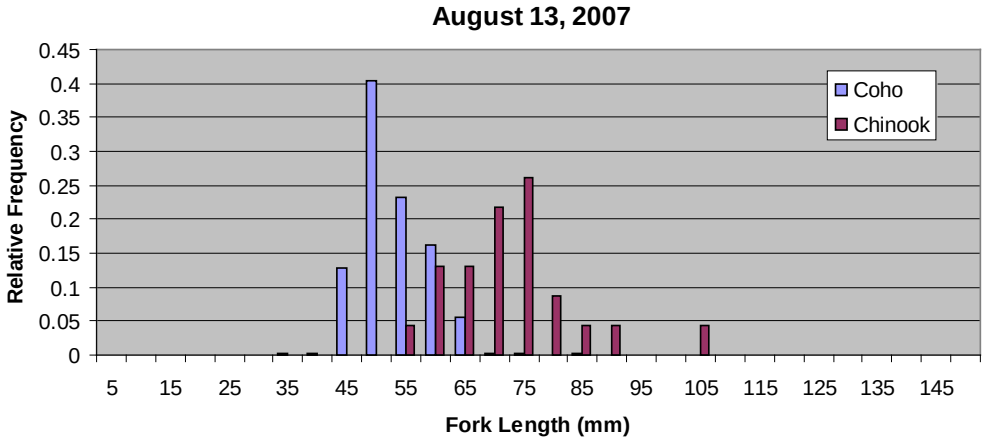

Figure 12. Length frequency distribution for coho and Chinook salmon in August of 2007.

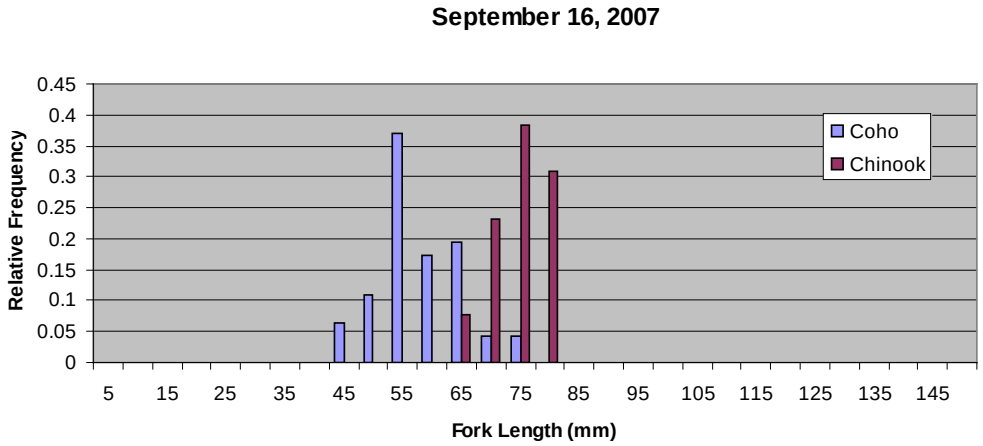

Figure 13. Length frequency distribution for coho and Chinook salmon in September of 2007.

Discussion

The concentrations of TAH within the Little Susitna River exceeded State Water Quality Standards on multiple dates above and below the Public Use Facility during the Chinook salmon fishery in June of 2008 and on one sampling date during the coho fishery in August of 2007. The concentrations during June of 2008 were much greater than those previously reported for the Kenai River (Oasis 2008, Kenai Watershed Forum 2008). We observed 11 to 12 boats on the Little Susitna River during hydrocarbon sampling at the two sites above and below the Public Use Facility. While not strictly comparable due to differences in the time to take samples, these numbers are within the range observed on the Kenai River (Oasis 2008). However, the volume of water within the Little Susitna River, near 500 cfs, is considerably lower than on the Kenai River near Soldotna, where flows are near 15,000 to 16,000 cfs. Similar use with reduced dilution due to lower flows would result in higher concentrations.

Boat use has been shown to be the causal factor related to increased concentrations of TAH within the Kenai River (Oasis 2008) and appears to be the source of hydrocarbons within the Little Susitna River. The use of two-cycle engines is believed to be the primary source; however, improper handling of fuels also could be a contributing factor. Based on our limited surveys, the ratio of 4-cycle to 2-cycle motors was 1:1 in 2007 and increased to near 2:1 in 2008. If 2-cycle motors are the primary source, concentrations should decrease over time as more 4-cycle motors are used. Monitoring of the extent and duration of hydrocarbon contamination along with the type of motors used should be continued in order to test this hypothesis.

We believe that the source of hydrocarbon contamination upstream from Houston was from the adjacent parking area due to the relative amount of constituents within samples and after ruling out other potential sources of contamination. Other potential sources investigated include residual contamination of the sampler or contamination of the sample bottles in the vehicle during transportation to sampling sites. Since all of the

sample bottles were stored and transported together, high concentrations of total xylenes occurred only at LSHUUP, and no hydrocarbons were found in trip blanks, we do not believe that the sample bottles were contaminated in transport. On each sampling date, we started at LSHUUP and worked downstream to LSPFDN. The sampler was cleaned with detergent and water from the Talkeetna Municipal well prior to each sampling event. If the cleaning process introduced hydrocarbons to the sampler, it would be expected to occur on all sampling dates, which it did not, unless there was short term contamination of the Municipal well which seems unlikely. Total xylenes were the major hydrocarbon component from LSHUUP samples, and this component was not found in samples collected from LSPFDNX the week before, so residual contamination of the sampler from the previous week is not possible. Since toluene, and not total xylenes, dominated hydrocarbon samples near the Public Use Facility, and in samples collected on the Kenai River, and we did not observe any boats at the upstream site, we do not believe that motor boats could have been the source of hydrocarbon contamination. The undeveloped parking area near the LSHUUP sampling locations contains garbage and other debris. It is certainly possible that the site has been used as an oil disposal area; however, we do not know if this could result in the volumes necessary to result in consistent contamination.

Stream water turbidity exceeded a 5 NTU difference compared to reference condition for three consecutive weeks at the sampling site located below the Public Use Facility. Differences in turbidity are clearly related to boat use as values within heavy use areas are the same as at reference conditions when boats are absent in the spring and fall and during the hours of 00:00 and 05:00. Turbidity values do not exceed State Water Quality Standards for the growth and propagation of fish and it is not clear whether the increase in turbidity is affecting primary production or the distribution or growth of juvenile salmonids. We measured differences in the abundance of juvenile salmon above and below the Public Use Facility in August during a time when there also were differences in turbidity and similar abundances in September when there were no differences. However, this does not confirm a causal relationship. Other factors that were not measured could have explained these differences such as the distribution of adult salmon, or differences in habitat characteristics. Further study is needed to identify whether differences in turbidity or TAH are having an adverse effect on the biotic community.

Stream water temperatures within the lower river near the Public Use Facility also exceeded State Water Quality Standards. In a separate study, ARRI measured stream water temperatures at 34 locations throughout the Matanuska-Susitna Borough during 2007 (Davis and Davis 2008). Among these sites, maximum stream water temperatures exceeded 15°C over 50% of the time in all but eight of the sampling locations. Based upon measures at these 34 locations, streams were segregated into cool, moderate, and warm water sites. The Little Susitna River at the Public Use Facility was among the cooler of those streams with moderate temperatures. Other streams with moderate temperatures included small and large low-sloped brown-water streams within the Susitna River drainage.

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Appendix A. Water Chemistry Results

Site	Date	Measurement	Value	Units
LSCHR	8/14/2006	Alkalinity	28	mg/L CaCO3
LSEDG	8/14/2006	Alkalinity	26	mg/L CaCO3
LSHUDN	8/14/2006	Alkalinity	26	mg/L CaCO3
LSHUUP	8/14/2006	Alkalinity	28	mg/L CaCO3
LSPFDN	8/14/2006	Alkalinity	38	mg/L CaCO3
LSPFUP	8/14/2006	Alkalinity	38	mg/L CaCO3
LSCHR	5/14/2007	Alkalinity	34	mg/L CaCO3
LSEDG	5/14/2007	Alkalinity	34	mg/L CaCO3
LSHUDN	5/14/2007	Alkalinity	40	mg/L CaCO3
LSHUUP	5/14/2007	Alkalinity	40	mg/L CaCO3
LSPFDN	5/14/2007	Alkalinity	42	mg/L CaCO3
LSPFDNX	5/14/2007	Alkalinity	40	mg/L CaCO3
LSPFUP	5/14/2007	Alkalinity	62	mg/L CaCO3
LSCHR	5/21/2007	Alkalinity	32	mg/L CaCO3
LSEDG	5/21/2007	Alkalinity	24	mg/L CaCO3
LSHUDN	5/21/2007	Alkalinity	38	mg/L CaCO3
LSHUUP	5/21/2007	Alkalinity	38	mg/L CaCO3
LSPFDN	5/21/2007	Alkalinity	40	mg/L CaCO3
LSPFDNX	5/21/2007	Alkalinity	42	mg/L CaCO3
LSPFUP	5/21/2007	Alkalinity	68	mg/L CaCO3
LSCHR	6/4/2007	Alkalinity	24	mg/L CaCO3
LSEDG	6/4/2007	Alkalinity	18	mg/L CaCO3
LSHUDN	6/4/2007	Alkalinity	32	mg/L CaCO3
LSHUUP	6/4/2007	Alkalinity	30	mg/L CaCO3
LSPFDN	6/4/2007	Alkalinity	36	mg/L CaCO3
LSPFDNX	6/4/2007	Alkalinity	36	mg/L CaCO3
LSPFUP	6/4/2007	Alkalinity	36	mg/L CaCO3
LSCHR	6/12/2007	Alkalinity	26	mg/L CaCO3
LSEDG	6/12/2007	Alkalinity	20	mg/L CaCO3
LSHUDN	6/12/2007	Alkalinity	30	mg/L CaCO3
LSHUUP	6/12/2007	Alkalinity	30	mg/L CaCO3
LSPFDN	6/12/2007	Alkalinity	36	mg/L CaCO3
LSPFDNX	6/12/2007	Alkalinity	36	mg/L CaCO3
LSPFUP	6/12/2007	Alkalinity	36	mg/L CaCO3
LSCHR	8/14/2006	Ammonia Nitrogen	0.43	mg/L
LSEDG	8/14/2006	Ammonia Nitrogen	0.024	mg/L
LSHUDN	8/14/2006	Ammonia Nitrogen	0.68	mg/L
LSHUUP	8/14/2006	Ammonia Nitrogen	0.08	mg/L
LSPFDN	8/14/2006	Ammonia Nitrogen	0.10	mg/L
LSPFUP	8/14/2006	Ammonia Nitrogen	0.091	mg/L
LSCHR	5/14/2007	Ammonia Nitrogen	0.088	mg/L
LSEDG	5/14/2007	Ammonia Nitrogen	0.38	mg/L
LSHUDN	5/14/2007	Ammonia Nitrogen	0.044	mg/L

Site	Date	Measurement	Value	Units
LSHUUP	5/14/2007	Ammonia Nitrogen	<0.005	mg/L
LSPFDN	5/14/2007	Ammonia Nitrogen	0.025	mg/L
LSPFDNX	5/14/2007	Ammonia Nitrogen	0.03	mg/L
LSPFUP	5/14/2007	Ammonia Nitrogen	0.091	mg/L
LSCHR	5/21/2007	Ammonia Nitrogen	0.01	mg/L
LSEDG	5/21/2007	Ammonia Nitrogen	<0.005	mg/L
LSHUDN	5/21/2007	Ammonia Nitrogen	<0.005	mg/L
LSHUUP	5/21/2007	Ammonia Nitrogen	<0.005	mg/L
LSPFDN	5/21/2007	Ammonia Nitrogen	0.14	mg/L
LSPFDNX	5/21/2007	Ammonia Nitrogen	<0.005	mg/L
LSPFUP	5/21/2007	Ammonia Nitrogen	0.007	mg/L
LSCHR	6/4/2007	Ammonia Nitrogen	0.063	mg/L
LSEDG	6/4/2007	Ammonia Nitrogen	<0.005	mg/L
LSHUDN	6/4/2007	Ammonia Nitrogen	0.021	mg/L
LSHUUP	6/4/2007	Ammonia Nitrogen	<0.005	mg/L
LSPFDN	6/4/2007	Ammonia Nitrogen	<0.005	mg/L
LSPFDNX	6/4/2007	Ammonia Nitrogen	<0.005	mg/L
LSPFUP	6/4/2007	Ammonia Nitrogen	<0.005	mg/L
LSCHR	6/12/2007	Ammonia Nitrogen	0.014	mg/L
LSEDG	6/12/2007	Ammonia Nitrogen	0.038	mg/L
LSHUDN	6/12/2007	Ammonia Nitrogen	0.056	mg/L
LSHUUP	6/12/2007	Ammonia Nitrogen	0.054	mg/L
LSPFDN	6/12/2007	Ammonia Nitrogen	0.009	mg/L
LSPFDNX	6/12/2007	Ammonia Nitrogen	0.011	mg/L
LSPFUP	6/12/2007	Ammonia Nitrogen	0.012	mg/L
LSCHR	6/20/2007	Ammonia Nitrogen	0.02	mg/L
LSEDG	6/20/2007	Ammonia Nitrogen	0.064	mg/L
LSHUDN	6/20/2007	Ammonia Nitrogen	0.074	mg/L
LSHUUP	6/20/2007	Ammonia Nitrogen	0.013	mg/L
LSPFDN	6/20/2007	Ammonia Nitrogen	0.035	mg/L
LSPFDNX	6/20/2007	Ammonia Nitrogen	0.046	mg/L
LSPFUP	6/20/2007	Ammonia Nitrogen	0.025	mg/L
LSHUDN	7/29/2007	Benzene	<0.5	mg/L
LSHUUP	7/29/2007	Benzene	<0.5	mg/L
LSPFDN	7/29/2007	Benzene	<0.5	mg/L
LSPFDNX	7/29/2007	Benzene	1.4	mg/L
LSPFUP	7/29/2007	Benzene	<0.5	mg/L
LSHUDN	8/5/2007	Benzene	<0.5	mg/L
LSHUUP	8/5/2007	Benzene	<0.5	mg/L
LSPFDN	8/5/2007	Benzene	<0.5	mg/L
LSPFDNX	8/5/2007	Benzene	<0.5	mg/L
LSPFUP	8/5/2007	Benzene	<0.5	mg/L
LSHUDN	8/12/2007	Benzene	<0.5	mg/L
LSHUUP	8/12/2007	Benzene	<0.5	mg/L

Site	Date	Measurement	Value	Units
LSPFDN	8/12/2007	Benzene	<0.5	mg/L
LSPFDNX	8/12/2007	Benzene	<0.5	mg/L
LSPFUP	8/12/2007	Benzene	<0.5	mg/L
LSHUDN	8/19/2007	Benzene	<0.5	mg/L
LSHUUP	8/19/2007	Benzene	<0.5	mg/L
LSPFDN	8/19/2007	Benzene	<0.5	mg/L
LSPFDNX	8/19/2007	Benzene	<0.5	mg/L
LSPFUP	8/19/2007	Benzene	<0.5	mg/L
LSHUDN	8/26/2007	Benzene	<0.5	mg/L
LSHUUP	8/26/2007	Benzene	<0.5	mg/L
LSPFDN	8/26/2007	Benzene	<0.5	mg/L
LSPFDNX	8/26/2007	Benzene	<0.5	mg/L
LSHUDN	9/2/2007	Benzene	<0.5	mg/L
LSHUUP	9/2/2007	Benzene	<0.5	mg/L
LSPFDN	9/2/2007	Benzene	<0.5	mg/L
LSPFDNX	9/2/2007	Benzene	<0.5	mg/L
LSPFUP	9/2/2007	Benzene	<0.5	mg/L
LSHUDN	9/9/2007	Benzene	<0.5	mg/L
LSHUUP	9/9/2007	Benzene	<0.5	mg/L
LSPFDN	9/9/2007	Benzene	<0.5	mg/L
LSPFDNX	9/9/2007	Benzene	<0.5	mg/L
LSPFUP	9/9/2007	Benzene	<0.5	mg/L
LSHUDN	9/16/2007	Benzene	<0.5	mg/L
LSHUUP	9/16/2007	Benzene	<0.5	mg/L
LSPFDN	9/16/2007	Benzene	<0.5	mg/L
LSPFDNX	9/16/2007	Benzene	<0.5	mg/L
LSPFUP	9/16/2007	Benzene	<0.5	mg/L
LSHUDN	5/10/2008	Benzene	<0.5	mg/L
LSHUUP	5/10/2008	Benzene	<0.5	mg/L
LSPFDN	5/10/2008	Benzene	<0.5	mg/L
LSPFDNX	5/10/2008	Benzene	<0.5	mg/L
LSPFUP	5/10/2008	Benzene	<0.5	mg/L
LSHUDN	5/18/2008	Benzene	<0.5	mg/L
LSHUUP	5/18/2008	Benzene	<0.5	mg/L
LSPFDN	5/18/2008	Benzene	<0.5	mg/L
LSPFDNX	5/18/2008	Benzene	<0.5	mg/L
LSPFUP	5/18/2008	Benzene	<0.5	mg/L
LSHUDN	5/24/2008	Benzene	<0.5	mg/L
LSHUUP	5/24/2008	Benzene	<0.5	mg/L
LSPFDN	5/24/2008	Benzene	2.29	mg/L
LSPFDNX	5/24/2008	Benzene	<0.5	mg/L
LSPFUP	5/24/2008	Benzene	<0.5	mg/L
LSHUDN	6/1/2008	Benzene	<0.5	mg/L
LSHUUP	6/1/2008	Benzene	<0.5	mg/L

Site	Date	Measurement	Value	Units
LSPFDN	6/1/2008	Benzene	9.52	mg/L
LSPFDNX	6/1/2008	Benzene	10.2	mg/L
LSPFUP	6/1/2008	Benzene	9.53	mg/L
LSHUDN	6/8/2008	Benzene	<0.5	mg/L
LSHUUP	6/8/2008	Benzene	<0.5	mg/L
LSPFDN	6/8/2008	Benzene	<0.5	mg/L
LSPFDNX	6/8/2008	Benzene	<0.5	mg/L
LSPFUP	6/8/2008	Benzene	<0.5	mg/L
LSHUDN	6/15/2008	Benzene	<0.5	mg/L
LSHUUP	6/15/2008	Benzene	<0.5	mg/L
LSPFDN	6/15/2008	Benzene	6.24	mg/L
LSPFDNX	6/15/2008	Benzene	4.47	mg/L
LSPFUP	6/15/2008	Benzene	2.83	mg/L
LSHUDN	6/21/2008	Benzene	<0.5	mg/L
LSHUUP	6/21/2008	Benzene	<0.5	mg/L
LSPFDN	6/21/2008	Benzene	<0.5	mg/L
LSPFDNX	6/21/2008	Benzene	<0.5	mg/L
LSPFUP	6/21/2008	Benzene	<0.5	mg/L
LSHUDN	6/29/2008	Benzene	<0.5	mg/L
LSHUUP	6/29/2008	Benzene	<0.5	mg/L
LSPFDN	6/29/2008	Benzene	3.33	mg/L
LSPFDNX	6/29/2008	Benzene	3.79	mg/L
LSPFUP	6/29/2008	Benzene	2.79	mg/L
LSCHR	8/14/2006	D.O.	11.43	mg/L
LSEDG	8/14/2006	D.O.	12.41	mg/L
LSHUDN	8/14/2006	D.O.	10.02	mg/L
LSHUUP	8/14/2006	D.O.	11.14	mg/L
LSPFDN	8/14/2006	D.O.	9.79	mg/L
LSPFUP	8/14/2006	D.O.	10.29	mg/L
LSCHR	5/14/2007	D.O.	11.64	mg/L
LSEDG	5/14/2007	D.O.	12.53	mg/L
LSHUDN	5/14/2007	D.O.	13.4	mg/L
LSHUUP	5/14/2007	D.O.	12.63	mg/L
LSPFDN	5/14/2007	D.O.	11.64	mg/L
LSPFUP	5/14/2007	D.O.	11.29	mg/L
LSCHR	5/21/2007	D.O.	12.45	mg/L
LSEDG	5/21/2007	D.O.	12.71	mg/L
LSHUDN	5/21/2007	D.O.	11.92	mg/L
LSPFDN	5/21/2007	D.O.	10.31	mg/L
LSPFUP	5/21/2007	D.O.	10.15	mg/L
LSCHR	6/4/2007	D.O.	11.2	mg/l
LSEDG	6/4/2007	D.O.	11.9	mg/L
LSHUDN	6/4/2007	D.O.	10.1	mg/L
LSHUUP	6/4/2007	D.O.	10.1	mg/L

Site	Date	Measurement	Value	Units
LSPFDN	6/4/2007	D.O.	9.15	mg/L
LSPFUP	6/4/2007	D.O.	9.1	mg/L
LSCHR	6/14/2007	D.O.	12.24	mg/L
LSEDG	6/14/2007	D.O.	12.44	mg/L
LSHUDN	6/14/2007	D.O.	11.05	mg/L
LSHUUP	6/14/2007	D.O.	11.32	mg/L
LSPFDN	6/14/2007	D.O.	9.1	mg/L
LSPFUP	6/14/2007	D.O.	9.0	mg/L
LSCHR	6/20/2007	D.O.	12.15	mg/L
LSEDG	6/20/2007	D.O.	11.47	mg/L
LSHUDN	6/20/2007	D.O.	11.4	mg/L
LSHUUP	6/20/2007	D.O.	11.81	mg/L
LSPFDN	6/20/2007	D.O.	10.66	mg/L
LSPFUP	6/20/2007	D.O.	10.04	mg/L
LSHUDN	8/26/2007	D.O.	10.47	mg/L
LSHUUP	8/26/2007	D.O.	10.48	mg/L
LSPFDN	8/26/2007	D.O.	10.47	mg/L
LSPFUP	8/26/2007	D.O.	10.55	mg/L
LSPFDN	7/23/2007	D.O.	9.45	mg/L
LSPFDNX	7/23/2007	D.O.	9.45	mg/L
LSPFUP	7/23/2007	D.O.	9.29	mg/L
LSHUDN	7/29/2007	D.O.	10.42	mg/L
LSHUUP	7/29/2007	D.O.	10.45	mg/L
LSPFDN	7/29/2007	D.O.	9.4	mg/L
LSPFUP	7/29/2007	D.O.	9.55	mg/L
LSHUDN	8/5/2007	D.O.	10.92	mg/L
LSHUUP	8/5/2007	D.O.	11.26	mg/L
LSPFDN	8/5/2007	D.O.	10.29	mg/L
LSPFUP	8/5/2007	D.O.	10.38	mg/L
LSHUDN	8/12/2007	D.O.	10.16	mg/L
LSHUUP	8/12/2007	D.O.	10.42	mg/L
LSPFDN	8/12/2007	D.O.	10.31	mg/L
LSPFUP	8/12/2007	D.O.	10.53	mg/L
LSHUDN	8/19/2007	D.O.	10.3	mg/L
LSHUUP	8/19/2007	D.O.	10.6	mg/L
LSPFDN	8/19/2007	D.O.	10.46	mg/L
LSPFUP	8/19/2007	D.O.	10.5	mg/L
LSCHR	8/14/2006	D.O. %	96.7	Percent Saturation
LSEDG	8/14/2006	D.O. %	104.2	Percent Saturation
LSHUDN	8/14/2006	D.O. %	95.4	Percent Saturation
LSHUUP	8/14/2006	D.O. %	95.7	Percent Saturation
LSPFDN	8/14/2006	D.O. %	92.4	Percent Saturation
LSPFUP	8/14/2006	D.O. %	94.9	Percent Saturation
LSCHR	5/14/2007	D.O. %	97.6	Percent Saturation

Site	Date	Measurement	Value	Units
LSEDG	5/14/2007	D.O. %	98.3	Percent Saturation
LSHUDN	5/14/2007	D.O. %	107	Percent Saturation
LSHUUP	5/14/2007	D.O. %	100.7	Percent Saturation
LSPFDN	5/14/2007	D.O. %	99.7	Percent Saturation
LSPFUP	5/14/2007	D.O. %	96.7	Percent Saturation
LSCHR	5/21/2007	D.O. %	100.9	Percent Saturation
LSEDG	5/21/2007	D.O. %	100.6	Percent Saturation
LSHUDN	5/21/2007	D.O. %	101.4	Percent Saturation
LSPFDN	5/21/2007	D.O. %	95.3	Percent Saturation
LSPFUP	5/21/2007	D.O. %	91.3	Percent Saturation
LSCHR	6/4/2007	D.O. %	98	Percent Saturation
LSEDG	6/4/2007	D.O. %	100	Percent Saturation
LSHUDN	6/4/2007	D.O. %	95	Percent Saturation
LSHUUP	6/4/2007	D.O. %	95	Percent Saturation
LSPFDN	6/4/2007	D.O. %	85.1	Percent Saturation
LSPFUP	6/4/2007	D.O. %	95.3	Percent Saturation
LSCHR	6/14/2007	D.O. %	99	Percent Saturation
LSEDG	6/14/2007	D.O. %	99.1	Percent Saturation
LSHUDN	6/14/2007	D.O. %	95.8	Percent Saturation
LSHUUP	6/14/2007	D.O. %	95.7	Percent Saturation
LSPFDN	6/14/2007	D.O. %	95	Percent Saturation
LSPFUP	6/14/2007	D.O. %	94	Percent Saturation
LSCHR	6/20/2007	D.O. %	106.5	Percent Saturation
LSEDG	6/20/2007	D.O. %	102.5	Percent Saturation
LSHUDN	6/20/2007	D.O. %	102.9	Percent Saturation
LSHUUP	6/20/2007	D.O. %	104.9	Percent Saturation
LSPFDN	6/20/2007	D.O. %	106.3	Percent Saturation
LSPFUP	6/20/2007	D.O. %	102.3	Percent Saturation
LSPFDN	7/23/2007	D.O. %	94	Percent Saturation
LSPFDNX	7/23/2007	D.O. %	93.9	Percent Saturation
LSPFUP	7/23/2007	D.O. %	94.5	Percent Saturation
LSHUDN	7/29/2007	D.O. %	99.2	Percent Saturation
LSHUUP	7/29/2007	D.O. %	95.4	Percent Saturation
LSPFDN	7/29/2007	D.O. %	99.5	Percent Saturation
LSPFUP	7/29/2007	D.O. %	102.2	Percent Saturation
LSHUDN	8/5/2007	D.O. %	96	Percent Saturation
LSHUUP	8/5/2007	D.O. %	97.9	Percent Saturation
LSPFDN	8/5/2007	D.O. %	97.8	Percent Saturation
LSPFUP	8/5/2007	D.O. %	100.3	Percent Saturation
LSHUDN	8/12/2007	D.O. %	93.3	Percent Saturation
LSHUUP	8/12/2007	D.O. %	94	Percent Saturation
LSPFDN	8/12/2007	D.O. %	101.7	Percent Saturation
LSPFUP	8/12/2007	D.O. %	104.5	Percent Saturation
LSHUDN	8/19/2007	D.O. %	93	Percent Saturation

Site	Date	Measurement	Value	Units
LSHUUP	8/19/2007	D.O. %	94.8	Percent Saturation
LSPFDN	8/19/2007	D.O. %	102.5	Percent Saturation
LSPFUP	8/19/2007	D.O. %	104	Percent Saturation
LSHUDN	8/26/2007	D.O. %	94	Percent Saturation
LSHUUP	8/26/2007	D.O. %	91.1	Percent Saturation
LSPFDN	8/26/2007	D.O. %	99.8	Percent Saturation
LSPFUP	8/26/2007	D.O. %	98.1	Percent Saturation
LSHUDN	7/29/2007	Ethyl Benzene	<0.5	mg/L
LSHUUP	7/29/2007	Ethyl Benzene	<0.5	mg/L
LSPFDN	7/29/2007	Ethyl Benzene	<0.5	mg/L
LSPFDNX	7/29/2007	Ethyl Benzene	<0.5	mg/L
LSPFUP	7/29/2007	Ethyl Benzene	<0.5	mg/L
LSHUDN	8/5/2007	Ethyl Benzene	<0.5	mg/L
LSHUUP	8/5/2007	Ethyl Benzene	<0.5	mg/L
LSPFDN	8/5/2007	Ethyl Benzene	<0.5	mg/L
LSPFDNX	8/5/2007	Ethyl Benzene	<0.5	mg/L
LSPFUP	8/5/2007	Ethyl Benzene	<0.5	mg/L
LSHUDN	8/12/2007	Ethyl Benzene	<0.5	mg/L
LSHUUP	8/12/2007	Ethyl Benzene	<0.5	mg/L
LSPFDN	8/12/2007	Ethyl Benzene	<0.5	mg/L
LSPFDNX	8/12/2007	Ethyl Benzene	<0.5	mg/L
LSPFUP	8/12/2007	Ethyl Benzene	<0.5	mg/L
LSHUDN	8/19/2007	Ethyl Benzene	<0.5	mg/L
LSHUUP	8/19/2007	Ethyl Benzene	<0.5	mg/L
LSPFDN	8/19/2007	Ethyl Benzene	<0.5	mg/L
LSPFDNX	8/19/2007	Ethyl Benzene	<0.5	mg/L
LSPFUP	8/19/2007	Ethyl Benzene	<0.5	mg/L
LSHUDN	8/26/2007	Ethyl Benzene	<0.5	mg/L
LSHUUP	8/26/2007	Ethyl Benzene	<0.5	mg/L
LSPFDN	8/26/2007	Ethyl Benzene	<0.5	mg/L
LSPFDNX	8/26/2007	Ethyl Benzene	<0.5	mg/L
LSHUDN	9/2/2007	Ethyl Benzene	<0.5	mg/L
LSHUUP	9/2/2007	Ethyl Benzene	<0.5	mg/L
LSPFDN	9/2/2007	Ethyl Benzene	<0.5	mg/L
LSPFDNX	9/2/2007	Ethyl Benzene	<0.5	mg/L
LSPFUP	9/2/2007	Ethyl Benzene	<0.5	mg/L
LSHUDN	9/9/2007	Ethyl Benzene	<0.5	mg/L
LSHUUP	9/9/2007	Ethyl Benzene	<0.5	mg/L
LSPFDN	9/9/2007	Ethyl Benzene	<0.5	mg/L
LSPFDNX	9/9/2007	Ethyl Benzene	<0.5	mg/L
LSPFUP	9/9/2007	Ethyl Benzene	<0.5	mg/L
LSHUDN	9/16/2007	Ethyl Benzene	<0.5	mg/L
LSHUUP	9/16/2007	Ethyl Benzene	<0.5	mg/L
LSPFDN	9/16/2007	Ethyl Benzene	<0.5	mg/L

Site	Date	Measurement	Value	Units
LSPFDNX	9/16/2007	Ethyl Benzene	<0.5	mg/L
LSPFUP	9/16/2007	Ethyl Benzene	<0.5	mg/L
LSHUDN	5/10/2008	Ethyl Benzene	<0.5	mg/L
LSHUUP	5/10/2008	Ethyl Benzene	<0.5	mg/L
LSPFDN	5/10/2008	Ethyl Benzene	<0.5	mg/L
LSPFDNX	5/10/2008	Ethyl Benzene	<0.5	mg/L
LSPFUP	5/10/2008	Ethyl Benzene	<0.5	mg/L
LSHUDN	5/18/2008	Ethyl Benzene	<0.5	mg/L
LSHUUP	5/18/2008	Ethyl Benzene	<0.5	mg/L
LSPFDN	5/18/2008	Ethyl Benzene	<0.5	mg/L
LSPFDNX	5/18/2008	Ethyl Benzene	<0.5	mg/L
LSPFUP	5/18/2008	Ethyl Benzene	<0.5	mg/L
LSHUDN	5/24/2008	Ethyl Benzene	<0.5	mg/L
LSHUUP	5/24/2008	Ethyl Benzene	2.89	mg/L
LSPFDN	5/24/2008	Ethyl Benzene	<0.5	mg/L
LSPFDNX	5/24/2008	Ethyl Benzene	<0.5	mg/L
LSPFUP	5/24/2008	Ethyl Benzene	<0.5	mg/L
LSHUDN	6/1/2008	Ethyl Benzene	<0.5	mg/L
LSHUUP	6/1/2008	Ethyl Benzene	1.48	mg/L
LSPFDN	6/1/2008	Ethyl Benzene	1.36	mg/L
LSPFDNX	6/1/2008	Ethyl Benzene	1.34	mg/L
LSPFUP	6/1/2008	Ethyl Benzene	1.41	mg/L
LSHUDN	6/8/2008	Ethyl Benzene	<0.5	mg/L
LSHUUP	6/8/2008	Ethyl Benzene	6.91	mg/L
LSPFDN	6/8/2008	Ethyl Benzene	0.5	mg/L
LSPFDNX	6/8/2008	Ethyl Benzene	<0.5	mg/L
LSPFUP	6/8/2008	Ethyl Benzene	<0.5	mg/L
LSHUDN	6/15/2008	Ethyl Benzene	<0.5	mg/L
LSHUUP	6/15/2008	Ethyl Benzene	<0.5	mg/L
LSPFDN	6/15/2008	Ethyl Benzene	1.17	mg/L
LSPFDNX	6/15/2008	Ethyl Benzene	0.76	mg/L
LSPFUP	6/15/2008	Ethyl Benzene	0.52	mg/L
LSHUDN	6/21/2008	Ethyl Benzene	<0.5	mg/L
LSHUUP	6/21/2008	Ethyl Benzene	<0.5	mg/L
LSPFDN	6/21/2008	Ethyl Benzene	<0.5	mg/L
LSPFDNX	6/21/2008	Ethyl Benzene	<0.5	mg/L
LSPFUP	6/21/2008	Ethyl Benzene	<0.5	mg/L
LSHUDN	6/29/2008	Ethyl Benzene	<0.5	mg/L
LSHUUP	6/29/2008	Ethyl Benzene	<0.5	mg/L
LSPFDN	6/29/2008	Ethyl Benzene	0.83	mg/L
LSPFDNX	6/29/2008	Ethyl Benzene	0.89	mg/L
LSPFUP	6/29/2008	Ethyl Benzene	0.54	mg/L
LSCHR	5/21/2007	Fecal Coliform	0	cfu/100 ml
LSEDG	5/21/2007	Fecal Coliform	5	cfu/100 ml

Site	Date	Measurement	Value	Units
LSHUDN	5/21/2007	Fecal Coliform	2	cfu/100 ml
LSPFDN	5/21/2007	Fecal Coliform	0	cfu/100 ml
LSPFDNX	5/21/2007	Fecal Coliform	5	cfu/100 ml
LSCHR	6/4/2007	Fecal Coliform	39	cfu/100 ml
LSEDG	6/4/2007	Fecal Coliform	2	cfu/100 ml
LSHUDN	6/4/2007	Fecal Coliform	12	cfu/100 ml
LSPFDN	6/4/2007	Fecal Coliform	18	cfu/100 ml
LSPFDNX	6/4/2007	Fecal Coliform	12	cfu/100 ml
LSCHR	6/12/2007	Fecal Coliform	2	cfu/100 ml
LSEDG	6/12/2007	Fecal Coliform	0	cfu/100 ml
LSHUDN	6/12/2007	Fecal Coliform	10	cfu/100 ml
LSPFDN	6/12/2007	Fecal Coliform	58	cfu/100 ml
LSPFDNX	6/12/2007	Fecal Coliform	58	cfu/100 ml
LSCHR	6/18/2007	Fecal Coliform	2	cfu/100 ml
LSEDG	6/18/2007	Fecal Coliform	0	cfu/100 ml
LSHUDN	6/18/2007	Fecal Coliform	11	cfu/100 ml
LSPFDN	6/18/2007	Fecal Coliform	61	cfu/100 ml
LSPFDNX	6/18/2007	Fecal Coliform	34	cfu/100 ml
LSCHR	8/14/2006	Nitrate+Nitrite	0.011	mg/L
LSEDG	8/14/2006	Nitrate+Nitrite	0.035	mg/L
LSHUDN	8/14/2006	Nitrate+Nitrite	0.025	mg/L
LSHUUP	8/14/2006	Nitrate+Nitrite	0.01	mg/L
LSPFDN	8/14/2006	Nitrate+Nitrite	0.021	mg/L
LSPFUP	8/14/2006	Nitrate+Nitrite	0.04	mg/L
LSCHR	5/14/2007	Nitrate+Nitrite	0.51	mg/L
LSEDG	5/14/2007	Nitrate+Nitrite	0.59	mg/L
LSHUDN	5/14/2007	Nitrate+Nitrite	0.35	mg/L
LSHUUP	5/14/2007	Nitrate+Nitrite	0.38	mg/L
LSPFDN	5/14/2007	Nitrate+Nitrite	0.16	mg/L
LSPFDNX	5/14/2007	Nitrate+Nitrite	0.17	mg/L
LSPFUP	5/14/2007	Nitrate+Nitrite	0.13	mg/L
LSCHR	5/21/2007	Nitrate+Nitrite	0.43	mg/L
LSEDG	5/21/2007	Nitrate+Nitrite	0.3	mg/L
LSHUDN	5/21/2007	Nitrate+Nitrite	36	mg/L
LSHUUP	5/21/2007	Nitrate+Nitrite	0.40	mg/L
LSPFDN	5/21/2007	Nitrate+Nitrite	0.19	mg/L
LSPFDNX	5/21/2007	Nitrate+Nitrite	0.2	mg/L
LSPFUP	5/21/2007	Nitrate+Nitrite	0.21	mg/L
LSCHR	6/4/2007	Nitrate+Nitrite	0.21	mg/L
LSEDG	6/4/2007	Nitrate+Nitrite	0.12	mg/L
LSHUDN	6/4/2007	Nitrate+Nitrite	0.21	mg/L
LSHUUP	6/4/2007	Nitrate+Nitrite	0.25	mg/L
LSPFDN	6/4/2007	Nitrate+Nitrite	0.16	mg/L
LSPFDNX	6/4/2007	Nitrate+Nitrite	0.17	mg/L

Site	Date	Measurement	Value	Units
LSPFUP	6/4/2007	Nitrate+Nitrite	0.18	mg/L
LSCHR	6/12/2007	Nitrate+Nitrite	0.14	mg/L
LSEDG	6/12/2007	Nitrate+Nitrite	0.079	mg/L
LSHUDN	6/12/2007	Nitrate+Nitrite	0.17	mg/L
LSHUUP	6/12/2007	Nitrate+Nitrite	0.15	mg/L
LSPFDN	6/12/2007	Nitrate+Nitrite	0.15	mg/L
LSPFDNX	6/12/2007	Nitrate+Nitrite	0.15	mg/L
LSPFUP	6/12/2007	Nitrate+Nitrite	0.15	mg/L
LSCHR	6/20/2007	Nitrate+Nitrite	0.12	mg/L
LSEDG	6/20/2007	Nitrate+Nitrite	0.10	mg/L
LSHUDN	6/20/2007	Nitrate+Nitrite	0.18	mg/L
LSHUUP	6/20/2007	Nitrate+Nitrite	0.19	mg/L
LSPFDN	6/20/2007	Nitrate+Nitrite	0.14	mg/L
LSPFDNX	6/20/2007	Nitrate+Nitrite	0.12	mg/L
LSPFUP	6/20/2007	Nitrate+Nitrite	0.13	mg/L
LSCHR	8/14/2006	pH	7.18	
LSEDG	8/14/2006	pH	7.3	
LSHUDN	8/14/2006	pH	7.17	
LSHUUP	8/14/2006	pH	7.16	
LSPFDN	8/14/2006	pH	7.32	
LSPFDNX	8/14/2006	pH	7.32	
LSPFUP	8/14/2006	pH	7.36	
LSCHR	5/14/2007	pH	7.17	
LSEDG	5/14/2007	pH	7.42	
LSHUDN	5/14/2007	pH	7.28	
LSHUUP	5/14/2007	pH	7.25	
LSPFDN	5/14/2007	pH	7.3	
LSPFDNX	5/14/2007	pH	7.32	
LSPFUP	5/14/2007	pH	7.37	
LSCHR	5/21/2007	pH	7.21	
LSEDG	5/21/2007	pH	7.32	
LSHUDN	5/21/2007	pH	7.33	
LSHUUP	5/21/2007	pH	7.32	
LSPFDN	5/21/2007	pH	7.43	
LSPFDNX	5/21/2007	pH	7.43	
LSPFUP	5/21/2007	pH	7.45	
LSCHR	6/4/2007	pH	7.05	
LSEDG	6/4/2007	pH	7.09	
LSHUDN	6/4/2007	pH	7.15	
LSHUUP	6/4/2007	pH	7.11	
LSPFDN	6/4/2007	pH	7.25	
LSPFDNX	6/4/2007	pH	7.25	
LSPFUP	6/4/2007	pH	7.21	
LSCHR	6/14/2007	pH	7.03	

Site	Date	Measurement	Value	Units
LSEDG	6/14/2007	pH	7.1	
LSHUDN	6/14/2007	pH	7.1	
LSHUUP	6/14/2007	pH	7.06	
LSPFDN	6/14/2007	pH	7.26	
LSPFDNX	6/14/2007	pH	7.23	
LSPFUP	6/14/2007	pH	7.34	
LSCHR	6/20/2007	pH	7.03	
LSEDG	6/20/2007	pH	7.05	
LSHUDN	6/20/2007	pH	7.06	
LSHUUP	6/20/2007	pH	7.07	
LSPFDN	6/20/2007	pH	7.15	
LSPFDNX	6/20/2007	pH	7.16	
LSPFUP	6/20/2007	pH	7.19	
LSPFDN	7/23/2007	pH	7.10	
LSPFDNX	7/23/2007	pH	7.10	
LSPFUP	7/23/2007	pH	7.08	
LSHUDN	7/29/2007	pH	7.13	
LSHUUP	7/29/2007	pH	7.11	
LSPFDN	7/29/2007	pH	7.35	
LSPFDNX	7/29/2007	pH	7.34	
LSPFUP	7/29/2007	pH	7.54	
LSHUDN	8/5/2007	pH	7.11	
LSHUUP	8/5/2007	pH	7.11	
LSPFDN	8/5/2007	pH	7.17	
LSPFDNX	8/5/2007	pH	7.17	
LSPFUP	8/5/2007	pH	7.1	
LSHUDN	8/12/2007	pH	7.21	
LSHUUP	8/12/2007	pH	7.17	
LSPFDN	8/12/2007	pH	7.29	
LSPFDNX	8/12/2007	pH	7.3	
LSPFUP	8/12/2007	pH	7.28	
LSHUDN	8/19/2007	pH	7.19	
LSHUUP	8/19/2007	pH	7.14	
LSPFDN	8/19/2007	pH	7.35	
LSPFDNX	8/19/2007	pH	7.35	
LSPFUP	8/19/2007	pH	7.35	
LSHUDN	8/26/2007	pH	7.13	
LSHUUP	8/26/2007	pH	7.1	
LSPFDN	8/26/2007	pH	7.36	
LSPFDNX	8/26/2007	pH	7.36	
LSPFUP	8/26/2007	pH	7.33	
LSHUDN	9/9/2007	pH	6.81	
LSHUUP	9/9/2007	pH	6.76	
LSPFDN	9/9/2007	pH	7.24	

Site	Date	Measurement	Value	Units
LSPFDNX	9/9/2007	pH	7.27	
LSPFUP	9/9/2007	pH	7.27	
LSHUDN	9/17/2007	pH	7.04	
LSHUUP	9/17/2007	pH	6.91	
LSPFDN	9/17/2007	pH	7.02	
LSPFDNX	9/17/2007	pH	7.01	
LSPFUP	9/17/2007	pH	7.11	
LSHUDN	5/10/2008	pH	7.33	
LSHUUP	5/10/2008	pH	7.28	
LSPFDN	5/10/2008	pH	7.2	
LSPFDNX	5/10/2008	pH	7.27	
LSPFUP	5/10/2008	pH	7.27	
LSHUDN	5/18/2008	pH	7.6	
LSHUUP	5/18/2008	pH	7.61	
LSPFDN	5/18/2008	pH	7.52	
LSPFDNX	5/18/2008	pH	7.5	
LSPFUP	5/18/2008	pH	7.54	
LSHUDN	5/24/2008	pH	7.47	
LSHUUP	5/24/2008	pH	7.45	
LSPFDN	5/24/2008	pH	7.36	
LSPFDNX	5/24/2008	pH	7.23	
LSPFUP	5/24/2008	pH	7.48	
LSHUDN	6/8/2008	pH	7.5	
LSHUUP	6/8/2008	pH	7.43	
LSPFDN	6/8/2008	pH	7.56	
LSPFDNX	6/8/2008	pH	7.54	
LSPFUP	6/8/2008	pH	7.79	
LSHUDN	6/15/2008	pH	7.37	
LSHUUP	6/15/2008	pH	7.33	
LSPFDN	6/15/2008	pH	7.42	
LSPFDNX	6/15/2008	pH	7.42	
LSPFUP	6/15/2008	pH	7.36	
LSHUDN	6/21/2008	pH	7.54	
LSHUUP	6/21/2008	pH	7.49	
LSPFDN	6/21/2008	pH	7.62	
LSPFDNX	6/21/2008	pH	7.62	
LSPFUP	6/21/2008	pH	7.65	
LSHUDN	6/29/2008	pH	7.3	
LSHUUP	6/29/2008	pH	7.25	
LSPFDN	6/29/2008	pH	7.28	
LSPFDNX	6/29/2008	pH	7.3	
LSPFUP	6/29/2008	pH	7.2	
LSCHR	8/14/2006	Specific Conductance	61.6	μS/cm
LSEDG	8/14/2006	Specific Conductance	56.3	μS/cm

Site	Date	Measurement	Value	Units
LSHUDN	8/14/2006	Specific Conductance	63.8	µS/cm
LSHUUP	8/14/2006	Specific Conductance	63.2	µS/cm
LSPFDN	8/14/2006	Specific Conductance	88.2	µS/cm
LSPFDNX	8/14/2006	Specific Conductance	87.5	µS/cm
LSPFUP	8/14/2006	Specific Conductance	84.4	µS/cm
LSCHR	5/8/2007	Specific Conductance	88.8	µS/cm
LSEDG	5/8/2007	Specific Conductance	87.3	µS/cm
LSEDGX	5/8/2007	Specific Conductance	87.6	µS/cm
LSHUDN	5/8/2007	Specific Conductance	96.9	µS/cm
LSPFDN	5/8/2007	Specific Conductance	87	µS/cm
LSPFDNX	5/8/2007	Specific Conductance	89.1	µS/cm
LSCHR	5/14/2007	Specific Conductance	95.5	µS/cm
LSEDG	5/14/2007	Specific Conductance	98.9	µS/cm
LSHUDN	5/14/2007	Specific Conductance	101.8	µS/cm
LSHUUP	5/14/2007	Specific Conductance	100.6	µS/cm
LSPFDN	5/14/2007	Specific Conductance	95.5	µS/cm
LSPFDNX	5/14/2007	Specific Conductance	94.4	µS/cm
LSPFUP	5/14/2007	Specific Conductance	138.8	µS/cm
LSCHR	5/21/2007	Specific Conductance	87.2	µS/cm
LSEDG	5/21/2007	Specific Conductance	69.8	µS/cm
LSHUDN	5/21/2007	Specific Conductance	99.9	µS/cm
LSHUUP	5/21/2007	Specific Conductance	94.5	µS/cm
LSPFDN	5/21/2007	Specific Conductance	102.1	µS/cm
LSPFDNX	5/21/2007	Specific Conductance	101.7	µS/cm
LSPFUP	5/21/2007	Specific Conductance	150.1	µS/cm
LSCHR	6/4/2007	Specific Conductance	66.5	µS/cm
LSEDG	6/4/2007	Specific Conductance	50.8	µS/cm
LSHUDN	6/4/2007	Specific Conductance	79	µS/cm
LSHUUP	6/4/2007	Specific Conductance	77.9	µS/cm
LSPFDN	6/4/2007	Specific Conductance	89.5	µS/cm
LSPFDNX	6/4/2007	Specific Conductance	89.3	µS/cm
LSPFUP	6/4/2007	Specific Conductance	89.5	µS/cm
LSCHR	6/14/2007	Specific Conductance	57.5	µS/cm
LSEDG	6/14/2007	Specific Conductance	46	µS/cm
LSHUDN	6/14/2007	Specific Conductance	66.7	µS/cm
LSHUUP	6/14/2007	Specific Conductance	64.4	µS/cm
LSPFDN	6/14/2007	Specific Conductance	78.8	µS/cm
LSPFDNX	6/14/2007	Specific Conductance	76.9	µS/cm
LSPFUP	6/14/2007	Specific Conductance	104.1	µS/cm
LSCHR	6/20/2007	Specific Conductance	60.5	µS/cm
LSEDG	6/20/2007	Specific Conductance	52.3	µS/cm
LSHUDN	6/20/2007	Specific Conductance	76	µS/cm
LSHUUP	6/20/2007	Specific Conductance	73.3	µS/cm
LSPFDN	6/20/2007	Specific Conductance	80.5	µS/cm

Site	Date	Measurement	Value	Units
LSPFDNX	6/20/2007	Specific Conductance	80.2	µS/cm
LSPFUP	6/20/2007	Specific Conductance	99.5	µS/cm
LSPFDN	7/23/2007	Specific Conductance	97.4	µS/cm
LSPFDNX	7/23/2007	Specific Conductance	98.1	µS/cm
LSPFUP	7/23/2007	Specific Conductance	94.1	µS/cm
LSHUDN	7/29/2007	Specific Conductance	90	µS/cm
LSHUUP	7/29/2007	Specific Conductance	88.2	µS/cm
LSPFDN	7/29/2007	Specific Conductance	95.4	µS/cm
LSPFDNX	7/29/2007	Specific Conductance	99.9	µS/cm
LSPFUP	7/29/2007	Specific Conductance	130.2	µS/cm
LSHUDN	8/5/2007	Specific Conductance	88.6	µS/cm
LSHUUP	8/5/2007	Specific Conductance	84.4	µS/cm
LSPFDN	8/5/2007	Specific Conductance	92.5	µS/cm
LSPFDNX	8/5/2007	Specific Conductance	94.2	µS/cm
LSPFUP	8/5/2007	Specific Conductance	97	µS/cm
LSHUDN	8/12/2007	Specific Conductance	75.1	µS/cm
LSHUUP	8/12/2007	Specific Conductance	73.6	µS/cm
LSPFDN	8/12/2007	Specific Conductance	78.6	µS/cm
LSPFDNx	8/12/2007	Specific Conductance	76.6	µS/cm
LSPFUP	8/12/2007	Specific Conductance	81.1	µS/cm
LSHUDN	8/19/2007	Specific Conductance	97.4	µS/cm
LSHUUP	8/19/2007	Specific Conductance	86.5	µS/cm
LSPFDN	8/19/2007	Specific Conductance	91.8	µS/cm
LSPFDNX	8/19/2007	Specific Conductance	91.7	µS/cm
LSPFUP	8/19/2007	Specific Conductance	91.8	µS/cm
LSHUDN	8/26/2007	Specific Conductance	91	µS/cm
LSHUUP	8/26/2007	Specific Conductance	89.7	µS/cm
LSPFDN	8/26/2007	Specific Conductance	99.9	µS/cm
LSPFDNX	8/26/2007	Specific Conductance	99.4	µS/cm
LSPFUP	8/26/2007	Specific Conductance	108.1	µS/cm
LSHUDN	9/9/2007	Specific Conductance	66.8	µS/cm
LSHUUP	9/9/2007	Specific Conductance	58.8	µS/cm
LSPFDN	9/9/2007	Specific Conductance	102.2	µS/cm
LSPFDNX	9/9/2007	Specific Conductance	102.2	µS/cm
LSPFUP	9/9/2007	Specific Conductance	100.4	µS/cm
LSHUDN	9/17/2007	Specific Conductance	84.1	µS/cm
LSHUUP	9/17/2007	Specific Conductance	79.8	µS/cm
LSPFDN	9/17/2007	Specific Conductance	81.2	µS/cm
LSPFDNX	9/17/2007	Specific Conductance	83.7	µS/cm
LSPFUP	9/17/2007	Specific Conductance	85.4	µS/cm
LSHUDN	5/10/2008	Specific Conductance	94.4	µS/cm
LSHUUP	5/10/2008	Specific Conductance	92.2	µS/cm
LSPFDN	5/10/2008	Specific Conductance	88.9	µS/cm
LSPFDNX	5/10/2008	Specific Conductance	88.9	µS/cm

Site	Date	Measurement	Value	Units
LSPFUP	5/10/2008	Specific Conductance	99.2	µS/cm
LSHUDN	5/18/2008	Specific Conductance	95.8	µS/cm
LSHUUP	5/18/2008	Specific Conductance	91.1	µS/cm
LSPFDN	5/18/2008	Specific Conductance	94.5	µS/cm
LSPFDNX	5/18/2008	Specific Conductance	95.2	µS/cm
LSPFUP	5/18/2008	Specific Conductance	98.6	µS/cm
LSHUDN	5/24/2008	Specific Conductance	83.5	µS/cm
LSHUUP	5/24/2008	Specific Conductance	83.8	µS/cm
LSPFDN	5/24/2008	Specific Conductance	124.6	µS/cm
LSPFDNX	5/24/2008	Specific Conductance	92.9	µS/cm
LSPFUP	5/24/2008	Specific Conductance	90.7	µS/cm
LSHUDN	6/8/2008	Specific Conductance	81.6	µS/cm
LSHUUP	6/8/2008	Specific Conductance	81.8	µS/cm
LSPFDN	6/8/2008	Specific Conductance	89.3	µS/cm
LSPFDNX	6/8/2008	Specific Conductance	88.9	µS/cm
LSPFUP	6/8/2008	Specific Conductance	149.2	µS/cm
LSHUDN	6/15/2008	Specific Conductance	71.2	µS/cm
LSHUUP	6/15/2008	Specific Conductance	77.5	µS/cm
LSPFDN	6/15/2008	Specific Conductance	80	µS/cm
LSPFDNX	6/15/2008	Specific Conductance	80	µS/cm
LSPFUP	6/15/2008	Specific Conductance	91.7	µS/cm
LSHUDN	6/21/2008	Specific Conductance	65.1	µS/cm
LSHUUP	6/21/2008	Specific Conductance	66.6	µS/cm
LSPFDN	6/21/2008	Specific Conductance	71.5	µS/cm
LSPFDNX	6/21/2008	Specific Conductance	75	µS/cm
LSPFUP	6/21/2008	Specific Conductance	77.9	µS/cm
LSHUDN	6/29/2008	Specific Conductance	80.3	µS/cm
LSHUUP	6/29/2008	Specific Conductance	79.2	µS/cm
LSPFDN	6/29/2008	Specific Conductance	83.9	µS/cm
LSPFDNX	6/29/2008	Specific Conductance	81.2	µS/cm
LSPFUP	6/29/2008	Specific Conductance	83.2	µS/cm
LSCHR	8/14/2006	Temperature	8.1	Celsius
LSEDG	8/14/2006	Temperature	7.4	Celsius
LSHUDN	8/14/2006	Temperature	8.8	Celsius
LSHUUP	8/14/2006	Temperature	8.6	Celsius
LSPFDN	8/14/2006	Temperature	12.6	Celsius
LSPFUP	8/14/2006	Temperature	12	Celsius
LSCHR	5/14/2007	Temperature	6.2	Celsius
LSEDG	5/14/2007	Temperature	5	Celsius
LSHUDN	5/14/2007	Temperature	6.1	Celsius
LSHUUP	5/14/2007	Temperature	5.6	Celsius
LSPFDN	5/14/2007	Temperature	8.6	Celsius
LSPFUP	5/14/2007	Temperature	8.6	Celsius
LSCHR	5/21/2007	Temperature	6.4	Celsius

Site	Date	Measurement	Value	Units
LSEDG	5/21/2007	Temperature	5.4	Celsius
LSHUDN	5/21/2007	Temperature	8.3	Celsius
LSPFDN	5/21/2007	Temperature	11.9	Celsius
LSPFUP	5/21/2007	Temperature	10.7	Celsius
LSCHR	6/4/2007	Temperature	6.5	Celsius
LSEDG	6/4/2007	Temperature	6	Celsius
LSHUDN	6/4/2007	Temperature	8.5	Celsius
LSHUUP	6/4/2007	Temperature	8	Celsius
LSPFDN	6/4/2007	Temperature	12.1	Celsius
LSPFUP	6/4/2007	Temperature	12.4	Celsius
LSCHR	6/14/2007	Temperature	6.2	Celsius
LSEDG	6/14/2007	Temperature	5.7	Celsius
LSHUDN	6/14/2007	Temperature	8.3	Celsius
LSHUUP	6/14/2007	Temperature	8.0	Celsius
LSPFUP	6/14/2007	Temperature	13	Celsius
LSCHR	6/20/2007	Temperature	9.7	Celsius
LSEDG	6/20/2007	Temperature	10.3	Celsius
LSHUDN	6/20/2007	Temperature	10.7	Celsius
LSHUUP	6/20/2007	Temperature	10	Celsius
LSPFDN	6/20/2007	Temperature	15.3	Celsius
LSPFUP	6/20/2007	Temperature	16.6	Celsius
LSPFDN	7/23/2007	Temperature	15.1	Celsius
LSPFDNX	7/23/2007	Temperature	15	Celsius
LSPFUP	7/23/2007	Temperature	15.1	Celsius
LSHUDN	7/29/2007	Temperature	12.7	Celsius
LSHUUP	7/29/2007	Temperature	11.3	Celsius
LSPFDN	7/29/2007	Temperature	18	Celsius
LSPFUP	7/29/2007	Temperature	18.7	Celsius
LSHUDN	8/5/2007	Temperature	9.7	Celsius
LSHUUP	8/5/2007	Temperature	9.3	Celsius
LSPFDN	8/5/2007	Temperature	13.1	Celsius
LSPFUP	8/5/2007	Temperature	13.1	Celsius
LSHUDN	8/12/2007	Temperature	11.4	Celsius
LSHUUP	8/12/2007	Temperature	10.6	Celsius
LSPFDN	8/12/2007	Temperature	14.9	Celsius
LSPFUP	8/12/2007	Temperature	15.2	Celsius
LSHUDN	8/19/2007	Temperature	10.9	Celsius
LSHUUP	8/19/2007	Temperature	10.3	Celsius
LSPFDN	8/19/2007	Temperature	14.6	Celsius
LSPFUP	8/19/2007	Temperature	14.9	Celsius
LSHUDN	8/26/2007	Temperature	9.9	Celsius
LSHUUP	8/26/2007	Temperature	9.3	Celsius
LSPFDN	8/26/2007	Temperature	13.2	Celsius
LSPFUP	8/26/2007	Temperature	12.5	Celsius

Site	Date	Measurement	Value	Units
LSHUDN	7/29/2007	Toluene	<0.5	mg/L
LSHUUP	7/29/2007	Toluene	<0.5	mg/L
LSPFDN	7/29/2007	Toluene	4.1	mg/L
LSPFDNX	7/29/2007	Toluene	4.3	mg/L
LSPFUP	7/29/2007	Toluene	2.6	mg/L
LSHUDN	8/5/2007	Toluene	<0.5	mg/L
LSHUUP	8/5/2007	Toluene	<0.5	mg/L
LSPFDN	8/5/2007	Toluene	<0.5	mg/L
LSPFDNX	8/5/2007	Toluene	<0.5	mg/L
LSPFUP	8/5/2007	Toluene	<0.5	mg/L
LSHUDN	8/12/2007	Toluene	<0.5	mg/L
LSHUUP	8/12/2007	Toluene	<0.5	mg/L
LSPFDN	8/12/2007	Toluene	<0.5	mg/L
LSPFDNX	8/12/2007	Toluene	<0.5	mg/L
LSPFUP	8/12/2007	Toluene	<0.5	mg/L
LSHUDN	8/19/2007	Toluene	<0.5	mg/L
LSHUUP	8/19/2007	Toluene	<0.5	mg/L
LSPFDN	8/19/2007	Toluene	8.17	mg/L
LSPFDNX	8/19/2007	Toluene	6.57	mg/L
LSPFUP	8/19/2007	Toluene	5.6	mg/L
LSHUDN	8/26/2007	Toluene	<0.5	mg/L
LSHUUP	8/26/2007	Toluene	<0.5	mg/L
LSPFDN	8/26/2007	Toluene	<0.5	mg/L
LSPFDNX	8/26/2007	Toluene	<0.5	mg/L
LSHUDN	9/2/2007	Toluene	<0.5	mg/L
LSHUUP	9/2/2007	Toluene	<0.5	mg/L
LSPFDN	9/2/2007	Toluene	<0.5	mg/L
LSPFDNX	9/2/2007	Toluene	<0.5	mg/L
LSPFUP	9/2/2007	Toluene	<0.5	mg/L
LSHUDN	9/9/2007	Toluene	<0.5	mg/L
LSHUUP	9/9/2007	Toluene	<0.5	mg/L
LSPFDN	9/9/2007	Toluene	<0.5	mg/L
LSPFDNX	9/9/2007	Toluene	<0.5	mg/L
LSPFUP	9/9/2007	Toluene	<0.5	mg/L
LSHUDN	9/16/2007	Toluene	<0.5	mg/L
LSHUUP	9/16/2007	Toluene	<0.5	mg/L
LSPFDN	9/16/2007	Toluene	<0.5	mg/L
LSPFDNX	9/16/2007	Toluene	<0.5	mg/L
LSPFUP	9/16/2007	Toluene	<0.5	mg/L
LSHUDN	5/10/2008	Toluene	<0.5	mg/L
LSHUUP	5/10/2008	Toluene	<0.5	mg/L
LSPFDN	5/10/2008	Toluene	<0.5	mg/L
LSPFDNX	5/10/2008	Toluene	<0.5	mg/L
LSPFUP	5/10/2008	Toluene	<0.5	mg/L

Site	Date	Measurement	Value	Units
LSHUDN	5/18/2008	Toluene	<0.5	mg/L
LSHUUP	5/18/2008	Toluene	<0.5	mg/L
LSPFDN	5/18/2008	Toluene	<0.5	mg/L
LSPFDNX	5/18/2008	Toluene	<0.5	mg/L
LSPFUP	5/18/2008	Toluene	<0.5	mg/L
LSHUDN	5/24/2008	Toluene	<0.5	mg/L
LSHUUP	5/24/2008	Toluene	4.73	mg/L
LSPFDN	5/24/2008	Toluene	2.96	mg/L
LSPFDNX	5/24/2008	Toluene	2.1	mg/L
LSPFUP	5/24/2008	Toluene	1.2	mg/L
LSHUDN	6/1/2008	Toluene	<0.5	mg/L
LSHUUP	6/1/2008	Toluene	2.89	mg/L
LSPFDN	6/1/2008	Toluene	13.0	mg/L
LSPFDNX	6/1/2008	Toluene	12.9	mg/L
LSPFUP	6/1/2008	Toluene	13.7	mg/L
LSHUDN	6/8/2008	Toluene	<0.5	mg/L
LSHUUP	6/8/2008	Toluene	7.64	mg/L
LSPFDN	6/8/2008	Toluene	74.7	mg/L
LSPFDNX	6/8/2008	Toluene	55.8	mg/L
LSPFUP	6/8/2008	Toluene	36.7	mg/L
LSHUDN	6/15/2008	Toluene	0.73	mg/L
LSHUUP	6/15/2008	Toluene	0.73	mg/L
LSPFDN	6/15/2008	Toluene	12.3	mg/L
LSPFDNX	6/15/2008	Toluene	7.61	mg/L
LSPFUP	6/15/2008	Toluene	4.88	mg/L
LSHUDN	6/21/2008	Toluene	<0.5	mg/L
LSHUUP	6/21/2008	Toluene	<0.5	mg/L
LSPFDN	6/21/2008	Toluene	9.09	mg/L
LSPFDNX	6/21/2008	Toluene	3.08	mg/L
LSPFUP	6/21/2008	Toluene	<0.5	mg/L
LSHUDN	6/29/2008	Toluene	1.15	mg/L
LSHUUP	6/29/2008	Toluene	0.7	mg/L
LSPFDN	6/29/2008	Toluene	7.47	mg/L
LSPFDNX	6/29/2008	Toluene	8.32	mg/L
LSPFUP	6/29/2008	Toluene	6.05	mg/L
LSCHR	8/14/2006	Total Dissolved Phosphorus	0.044	mg/L
LSEDG	8/14/2006	Total Dissolved Phosphorus	0.011	mg/L
LSHUDN	8/14/2006	Total Dissolved Phosphorus	0.093	mg/L
LSHUUP	8/14/2006	Total Dissolved Phosphorus	0.1	mg/L
LSPFDN	8/14/2006	Total Dissolved Phosphorus	0.033	mg/L
LSPFUP	8/14/2006	Total Dissolved Phosphorus	0.04	mg/L
LSCHR	5/14/2007	Total Dissolved Phosphorus	0.005	mg/L
LSEDG	5/14/2007	Total Dissolved Phosphorus	0.02	mg/L
LSHUDN	5/14/2007	Total Dissolved Phosphorus	0.007	mg/L

Site	Date	Measurement	Value	Units
LSHUUP	5/14/2007	Total Dissolved Phosphorus	0.005	mg/L
LSPFDN	5/14/2007	Total Dissolved Phosphorus	0.007	mg/L
LSPFDNX	5/14/2007	Total Dissolved Phosphorus	0.007	mg/L
LSPFUP	5/14/2007	Total Dissolved Phosphorus	0.007	mg/L
LSCHR	5/21/2007	Total Dissolved Phosphorus	0.017	mg/L
LSEDG	5/21/2007	Total Dissolved Phosphorus	0.014	mg/L
LSHUDN	5/21/2007	Total Dissolved Phosphorus	0.011	mg/L
LSHUUP	5/21/2007	Total Dissolved Phosphorus	0.011	mg/L
LSPFDN	5/21/2007	Total Dissolved Phosphorus	0.017	mg/L
LSPFDNX	5/21/2007	Total Dissolved Phosphorus	0.014	mg/L
LSPFUP	5/21/2007	Total Dissolved Phosphorus	0.017	mg/L
LSCHR	6/4/2007	Total Dissolved Phosphorus	0.09	mg/L
LSEDG	6/4/2007	Total Dissolved Phosphorus	0.034	mg/L
LSHUDN	6/4/2007	Total Dissolved Phosphorus	0.044	mg/L
LSHUUP	6/4/2007	Total Dissolved Phosphorus	0.032	mg/L
LSPFDN	6/4/2007	Total Dissolved Phosphorus	0.043	mg/L
LSPFDNX	6/4/2007	Total Dissolved Phosphorus	0.031	mg/L
LSPFUP	6/4/2007	Total Dissolved Phosphorus	0.032	mg/L
LSCHR	6/12/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSEDG	6/12/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSHUDN	6/12/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSHUUP	6/12/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSPFDN	6/12/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSPFDNX	6/12/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSPFUP	6/12/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSCHR	6/20/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSEDG	6/20/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSHUDN	6/20/2007	Total Dissolved Phosphorus	0.005	mg/L
LSHUUP	6/20/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSPFDN	6/20/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSPFDNX	6/20/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSPFUP	6/20/2007	Total Dissolved Phosphorus	<0.001	mg/L
LSCHR	8/14/2006	Total Phosphorus	0.045	mg/L
LSEDG	8/14/2006	Total Phosphorus	0.013	mg/L
LSHUDN	8/14/2006	Total Phosphorus	0.12	mg/L
LSHUUP	8/14/2006	Total Phosphorus	0.1	mg/L
LSPFDN	8/14/2006	Total Phosphorus	0.039	mg/L
LSPFUP	8/14/2006	Total Phosphorus	0.043	mg/L
LSCHR	5/14/2007	Total Phosphorus	0.015	mg/L
LSEDG	5/14/2007	Total Phosphorus	0.013	mg/L
LSHUDN	5/14/2007	Total Phosphorus	0.012	mg/L
LSHUUP	5/14/2007	Total Phosphorus	0.034	mg/L
LSPFDN	5/14/2007	Total Phosphorus	0.053	mg/L
LSPFDNX	5/14/2007	Total Phosphorus	0.046	mg/L

Site	Date	Measurement	Value	Units
LSPFUP	5/14/2007	Total Phosphorus	0.006	mg/L
LSCHR	5/21/2007	Total Phosphorus	0.016	mg/L
LSEDG	5/21/2007	Total Phosphorus	0.014	mg/L
LSHUDN	5/21/2007	Total Phosphorus	0.018	mg/L
LSHUUP	5/21/2007	Total Phosphorus	0.016	mg/L
LSPFDN	5/21/2007	Total Phosphorus	0.017	mg/L
LSPFDNX	5/21/2007	Total Phosphorus	0.016	mg/L
LSPFUP	5/21/2007	Total Phosphorus	0.017	mg/L
LSCHR	6/4/2007	Total Phosphorus	0.026	mg/L
LSEDG	6/4/2007	Total Phosphorus	0.04	mg/L
LSHUDN	6/4/2007	Total Phosphorus	0.053	mg/L
LSHUUP	6/4/2007	Total Phosphorus	0.04	mg/L
LSPFDN	6/4/2007	Total Phosphorus	0.05	mg/L
LSPFDNX	6/4/2007	Total Phosphorus	0.055	mg/L
LSPFUP	6/4/2007	Total Phosphorus	0.041	mg/L
LSCHR	6/12/2007	Total Phosphorus	0.02	mg/L
LSEDG	6/12/2007	Total Phosphorus	0.009	mg/L
LSHUDN	6/12/2007	Total Phosphorus	0.028	mg/L
LSHUUP	6/12/2007	Total Phosphorus	0.016	mg/L
LSPFDN	6/12/2007	Total Phosphorus	0.034	mg/L
LSPFDNX	6/12/2007	Total Phosphorus	0.05	mg/L
LSPFUP	6/12/2007	Total Phosphorus	0.038	mg/L
LSCHR	6/20/2007	Total Phosphorus	0.02	mg/L
LSEDG	6/20/2007	Total Phosphorus	0.016	mg/L
LSHUDN	6/20/2007	Total Phosphorus	0.022	mg/L
LSHUUP	6/20/2007	Total Phosphorus	0.015	mg/L
LSPFDN	6/20/2007	Total Phosphorus	0.07	mg/L
LSPFDNX	6/20/2007	Total Phosphorus	0.044	mg/L
LSPFUP	6/20/2007	Total Phosphorus	0.026	mg/L
LSHUDN	7/29/2007	Total Xylene	<1.0	mg/L
LSHUUP	7/29/2007	Total Xylene	<1.0	mg/L
LSPFDN	7/29/2007	Total Xylene	1.0	mg/L
LSPFDNX	7/29/2007	Total Xylene	1.1	mg/L
LSPFUP	7/29/2007	Total Xylene	<1.0	mg/L
LSHUDN	8/5/2007	Total Xylene	<1.0	mg/L
LSHUUP	8/5/2007	Total Xylene	<1.0	mg/L
LSPFDN	8/5/2007	Total Xylene	<1.0	mg/L
LSPFDNX	8/5/2007	Total Xylene	<1.0	mg/L
LSPFUP	8/5/2007	Total Xylene	<1.0	mg/L
LSHUDN	8/12/2007	Total Xylene	<1.0	mg/L
LSHUUP	8/12/2007	Total Xylene	<1.0	mg/L
LSPFDN	8/12/2007	Total Xylene	<1.0	mg/L
LSPFDNX	8/12/2007	Total Xylene	<1.0	mg/L
LSPFUP	8/12/2007	Total Xylene	<1.0	mg/L

Site	Date	Measurement	Value	Units
LSHUDN	8/19/2007	Total Xylene	<1.0	mg/L
LSHUUP	8/19/2007	Total Xylene	<1.0	mg/L
LSPFDN	8/19/2007	Total Xylene	2	mg/L
LSPFDNX	8/19/2007	Total Xylene	1.58	mg/L
LSPFUP	8/19/2007	Total Xylene	1.1	mg/L
LSHUDN	8/26/2007	Total Xylene	<1.0	mg/L
LSHUUP	8/26/2007	Total Xylene	<1.0	mg/L
LSPFDN	8/26/2007	Total Xylene	<1.0	mg/L
LSPFDNX	8/26/2007	Total Xylene	<1.0	mg/L
LSHUDN	9/2/2007	Total Xylene	<1.0	mg/L
LSHUUP	9/2/2007	Total Xylene	<1.0	mg/L
LSPFDN	9/2/2007	Total Xylene	<1.0	mg/L
LSPFDNX	9/2/2007	Total Xylene	<1.0	mg/L
LSPFUP	9/2/2007	Total Xylene	<1.0	mg/L
LSHUDN	9/9/2007	Total Xylene	<1.0	mg/L
LSHUUP	9/9/2007	Total Xylene	<1.0	mg/L
LSPFDN	9/9/2007	Total Xylene	<1.0	mg/L
LSPFDNX	9/9/2007	Total Xylene	<1.0	mg/L
LSPFUP	9/9/2007	Total Xylene	<1.0	mg/L
LSHUDN	9/16/2007	Total Xylene	<1.0	mg/L
LSHUUP	9/16/2007	Total Xylene	<1.0	mg/L
LSPFDN	9/16/2007	Total Xylene	<1.0	mg/L
LSPFDNX	9/16/2007	Total Xylene	<1.0	mg/L
LSPFUP	9/16/2007	Total Xylene	<1.0	mg/L
LSHUDN	5/10/2008	Total Xylene	<1	mg/L
LSHUUP	5/10/2008	Total Xylene	<1	mg/L
LSPFDN	5/10/2008	Total Xylene	<1	mg/L
LSPFDNX	5/10/2008	Total Xylene	<1	mg/L
LSPFUP	5/10/2008	Total Xylene	<1	mg/L
LSHUDN	5/18/2008	Total Xylene	<1	mg/L
LSHUUP	5/18/2008	Total Xylene	1.53	mg/L
LSPFDN	5/18/2008	Total Xylene	<1	mg/L
LSPFDNX	5/18/2008	Total Xylene	<1	mg/L
LSPFUP	5/18/2008	Total Xylene	<1	mg/L
LSHUDN	5/24/2008	Total Xylene	<1	mg/L
LSHUUP	5/24/2008	Total Xylene	8.22	mg/L
LSPFDN	5/24/2008	Total Xylene	<1	mg/L
LSPFDNX	5/24/2008	Total Xylene	<1	mg/L
LSPFUP	5/24/2008	Total Xylene	<1	mg/L
LSHUDN	6/1/2008	Total Xylene	<1	mg/L
LSHUUP	6/1/2008	Total Xylene	4.78	mg/L
LSPFDN	6/1/2008	Total Xylene	3.73	mg/L
LSPFDNX	6/1/2008	Total Xylene	3.31	mg/L
LSPFUP	6/1/2008	Total Xylene	3.95	mg/L

Site	Date	Measurement	Value	Units
LSHUDN	6/8/2008	Total Xylene	<1	mg/L
LSHUUP	6/8/2008	Total Xylene	24.3	mg/L
LSPFDN	6/8/2008	Total Xylene	<1	mg/L
LSPFDNX	6/8/2008	Total Xylene	<1	mg/L
LSPFUP	6/8/2008	Total Xylene	<1	mg/L
LSHUDN	6/15/2008	Total Xylene	<1	mg/L
LSHUUP	6/15/2008	Total Xylene	<1	mg/L
LSPFDN	6/15/2008	Total Xylene	3.13	mg/L
LSPFDNX	6/15/2008	Total Xylene	2.19	mg/L
LSPFUP	6/15/2008	Total Xylene	1.34	mg/L
LSHUDN	6/21/2008	Total Xylene	<1	mg/L
LSHUUP	6/21/2008	Total Xylene	<1	mg/L
LSPFDN	6/21/2008	Total Xylene	<1	mg/L
LSPFDNX	6/21/2008	Total Xylene	1.61	mg/L
LSPFUP	6/21/2008	Total Xylene	<1	mg/L
LSHUDN	6/29/2008	Total Xylene	<1	mg/L
LSHUUP	6/29/2008	Total Xylene	<1	mg/L
LSPFDN	6/29/2008	Total Xylene	1.47	mg/L
LSPFDNX	6/29/2008	Total Xylene	1.71	mg/L
LSPFUP	6/29/2008	Total Xylene	1.64	mg/L
LSCHR	8/14/2006	Turbidity	5.5	NTU
LSEDG	8/14/2006	Turbidity	3.7	NTU
LSHUDN	8/14/2006	Turbidity	8.1	NTU
LSHUUP	8/14/2006	Turbidity	6.1	NTU
LSPFDN	8/14/2006	Turbidity	7.8	NTU
LSPFDNX	8/14/2006	Turbidity	5.3	NTU
LSPFUP	8/14/2006	Turbidity	5	NTU
LSCHR	5/14/2007	Turbidity	0.9	NTU
LSEDG	5/14/2007	Turbidity	1.1	NTU
LSHUDN	5/14/2007	Turbidity	1.5	NTU
LSHUUP	5/14/2007	Turbidity	1.5	NTU
LSPFDN	5/14/2007	Turbidity	2.7	NTU
LSPFDNX	5/14/2007	Turbidity	2.5	NTU
LSPFUP	5/14/2007	Turbidity	1.7	NTU
LSCHR	5/21/2007	Turbidity	1.6	NTU
LSEDG	5/21/2007	Turbidity	1.5	NTU
LSHUDN	5/21/2007	Turbidity	2	NTU
LSHUUP	5/21/2007	Turbidity	1.2	NTU
LSPFDN	5/21/2007	Turbidity	2	NTU
LSPFDNX	5/21/2007	Turbidity	2.1	NTU
LSPFUP	5/21/2007	Turbidity	1.8	NTU
LSCHR	6/4/2007	Turbidity	1.3	NTU
LSEDG	6/4/2007	Turbidity	1.4	NTU
LSHUDN	6/4/2007	Turbidity	1.6	NTU

Site	Date	Measurement	Value	Units
LSHUUP	6/4/2007	Turbidity	1.6	NTU
LSPFDN	6/4/2007	Turbidity	2.5	NTU
LSPFDNX	6/4/2007	Turbidity	3	NTU
LSPFUP	6/4/2007	Turbidity	2.5	NTU
LSCHR	6/14/2007	Turbidity	3.5	NTU
LSEDG	6/14/2007	Turbidity	3.8	NTU
LSHUDN	6/14/2007	Turbidity	4.2	NTU
LSHUUP	6/14/2007	Turbidity	3.8	NTU
LSPFDN	6/14/2007	Turbidity	13	NTU
LSPFDNX	6/14/2007	Turbidity	18	NTU
LSPFUP	6/14/2007	Turbidity	5.9	NTU
LSCHR	6/20/2007	Turbidity	5.2	NTU
LSEDG	6/20/2007	Turbidity	3.6	NTU
LSHUDN	6/20/2007	Turbidity	5.4	NTU
LSHUUP	6/20/2007	Turbidity	5.6	NTU
LSPFDN	6/20/2007	Turbidity	12	NTU
LSPFDNX	6/20/2007	Turbidity	16	NTU
LSPFUP	6/20/2007	Turbidity	8.9	NTU
LSPFDN	7/23/2007	Turbidity	8	NTU
LSPFDNX	7/23/2007	Turbidity	5.5	NTU
LSPFUP	7/23/2007	Turbidity	2.5	NTU
LSHUDN	7/29/2007	Turbidity	4	NTU
LSHUUP	7/29/2007	Turbidity	4.7	NTU
LSPFDN	7/29/2007	Turbidity	7.2	NTU
LSPFDNX	7/29/2007	Turbidity	4.1	NTU
LSPFUP	7/29/2007	Turbidity	3.3	NTU
LSHUDN	8/5/2007	Turbidity	4.5	NTU
LSHUUP	8/5/2007	Turbidity	3.5	NTU
LSPFDN	8/5/2007	Turbidity	8	NTU
LSPFDNX	8/5/2007	Turbidity	7.4	NTU
LSPFUP	8/5/2007	Turbidity	7.3	NTU
LSHUDN	8/12/2007	Turbidity	3.9	NTU
LSHUUP	8/12/2007	Turbidity	4	NTU
LSPFDN	8/12/2007	Turbidity	10	NTU
LSPFDNX	8/12/2007	Turbidity	10	NTU
LSPFUP	8/12/2007	Turbidity	5.5	NTU
LSHUDN	8/19/2007	Turbidity	3.1	NTU
LSHUUP	8/19/2007	Turbidity	3.6	NTU
LSPFDN	8/19/2007	Turbidity	7.4	NTU
LSPFDNX	8/19/2007	Turbidity	7.1	NTU
LSPFUP	8/19/2007	Turbidity	7.4	NTU
LSHUDN	8/26/2007	Turbidity	4.9	NTU
LSHUUP	8/26/2007	Turbidity	3.5	NTU
LSPFDN	8/26/2007	Turbidity	5.6	NTU

Site	Date	Measurement	Value	Units
LSPFDNX	8/26/2007	Turbidity	4.9	NTU
LSPFUP	8/26/2007	Turbidity	5.7	NTU
LSHUDN	9/2/2007	Turbidity	2.7	NTU
LSHUUP	9/2/2007	Turbidity	2.7	NTU
LSPFDN	9/2/2007	Turbidity	2.6	NTU
LSPFDNX	9/2/2007	Turbidity	2.6	NTU
LSPFUP	9/2/2007	Turbidity	2.7	NTU
LSHUDN	9/9/2007	Turbidity	43	NTU
LSHUUP	9/9/2007	Turbidity	34	NTU
LSPFDN	9/9/2007	Turbidity	4.4	NTU
LSPFDNX	9/9/2007	Turbidity	6.8	NTU
LSPFUP	9/9/2007	Turbidity	4.2	NTU
LSHUDN	9/17/2007	Turbidity	6	NTU
LSHUUP	9/17/2007	Turbidity	4.5	NTU
LSPFDN	9/17/2007	Turbidity	4	NTU
LSPFDNX	9/17/2007	Turbidity	3.8	NTU
LSPFUP	9/17/2007	Turbidity	3.1	NTU
LSHUDN	5/10/2008	Turbidity	0.06	NTU
LSHUUP	5/10/2008	Turbidity	0.38	NTU
LSPFDN	5/10/2008	Turbidity	3.89	NTU
LSPFDNX	5/10/2008	Turbidity	1.79	NTU
LSPFUP	5/10/2008	Turbidity	1.18	NTU
LSHUDN	5/18/2008	Turbidity	1.41	NTU
LSHUUP	5/18/2008	Turbidity	1.84	NTU
LSPFDN	5/18/2008	Turbidity	6.04	NTU
LSPFDNX	5/18/2008	Turbidity	6.73	NTU
LSPFUP	5/18/2008	Turbidity	2.31	NTU
LSHUDN	5/24/2008	Turbidity	1.07	NTU
LSHUUP	5/24/2008	Turbidity	0.47	NTU
LSPFDN	5/24/2008	Turbidity	6.47	NTU
LSPFDNX	5/24/2008	Turbidity	7.26	NTU
LSPFUP	5/24/2008	Turbidity	1.62	NTU
LSHUDN	6/8/2008	Turbidity	2.56	NTU
LSHUUP	6/8/2008	Turbidity	1.96	NTU
LSPFDN	6/8/2008	Turbidity	12.7	NTU
LSPFDNX	6/8/2008	Turbidity	15.3	NTU
LSPFUP	6/8/2008	Turbidity	2.03	NTU
LSHUDN	6/15/2008	Turbidity	2.58	NTU
LSHUUP	6/15/2008	Turbidity	2.07	NTU
LSPFDN	6/15/2008	Turbidity	18.1	NTU
LSPFDNX	6/15/2008	Turbidity	19.1	NTU
LSPFUP	6/15/2008	Turbidity	9.17	NTU
LSHUDN	6/21/2008	Turbidity	6.69	NTU
LSHUUP	6/21/2008	Turbidity	6.59	NTU

Site	Date	Measurement	Value	Units
LSPFDN	6/21/2008	Turbidity	10.3	NTU
LSPFDNX	6/21/2008	Turbidity	11.4	NTU
LSPFUP	6/21/2008	Turbidity	8.63	NTU
LSHUDN	6/29/2008	Turbidity	2.28	NTU
LSHUUP	6/29/2008	Turbidity	0.12	NTU
LSPFDN	6/29/2008	Turbidity	3.89	NTU
LSPFDNX	6/29/2008	Turbidity	5.6	NTU
LSPFUP	6/29/2008	Turbidity	3.54	NTU

Appendix B. Sampling Plan and QAPP