Keeyask Generation Project

Sediment Management Plan for In-stream Construction

Sediment Management Plan Report

SMP-2020-01

KEEYASK

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KEEYASK GENERATION PROJECT

SEDIMENT MANAGEMENT PLAN FOR IN-STREAM CONSTRUCTION

REPORT #SMP-2020-01

ANNUAL REPORT

April 2019 – March 2020: Year 6 Construction

Prepared by

Manitoba Hydro

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SUMMARY

This *Sediment Management Plan for In-stream Construction* (SMP) was developed for the construction phase of the Keeyask Generation Project (the Project) to minimize the impacts of in-stream sediment generated from construction activities on the Nelson River. Excessive amounts of sediment generated during construction could change the water quality and be harmful to fish and fish habitat.

Sediment in the river is measured every 15 minutes at locations up and downstream of the construction site using an automated system to track sediment changes during major in-stream work, such as placing/removing rock from the river to build cofferdams. A SMP location is shown below. The readings are sent to a computer where personnel watch and compare the amount of sediment between up and downstream, in real time. The change in sediment observed is compared to predetermined action levels, which are 1) and instant reading of at least 200 mg/L above the sediment concentration measured upstream and 2) a one-hour, sustained reading where the sediment is more than 25 mg/L above the sediment concentration measured upstream. These action levels were determined by the Keeyask Hydropower Limited Partnership in consultation with provincial and federal regulators. Should the action levels be exceeded, site personnel would work with the contractor to reduce the amount of sediment entering the river during the construction activity, for example, slowing down in-water rock removal to reduce the amount of sediment produced.

A turbidity senor (left) is used for determining the sediment in the water. It is suspended in the water from a catamaran (right), which is used in both summer and winter for the SMP.

Major instream work activities that were expected to introduce sediment into the river for the reporting period were: installing drains in the South Dam; constructing, and later removing, the North Channel Rock Groin and removing both the Tailrace Cofferdam and the North Channel Cofferdam. The sediment measured during these activities showed no exceedances of the action levels in the SMP during 2019/2020.

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1.0 INTRODUCTION

The Keeyask Generation Project (the Project) is a 695-megawatt (MW) hydroelectric generating station at Gull Rapids on the lower Nelson River in northern Manitoba. The Project is approximately 725 kilometres (km) northeast of Winnipeg, 35 km upstream of the existing Kettle Generating Station, where Gull Lake flows into Stephens Lake, 60 km east of the community of Split Lake, 180 km east-northeast of Thompson and 30 km west of Gillam. Construction of the Project began in July 2014.

The principal structures for the Keeyask Generating Station are:

- North and South Dykes;
- North, Central and South Dams;
- Powerhouse complex including the intake and tailrace channels; and
- Spillway including an approach channel and discharge channel.

The *Keeyask Generation Project: Response to EIS Guidelines*, (EIS) completed in June 2012, provides a summary of predicted effects and planned mitigation for the Project. The *Sediment Management Plan for In-stream Construction* (SMP) (KHLP 2014) was developed for the construction phase of the Project, to minimize the impacts of in-stream sediment from construction activities in the Nelson River. It describes the monitoring and management of Total Suspended Solids (TSS) inputs into the waterway that may occur because of shoreline erosion, in-stream construction, river management, and commissioning of the Spillway and the Powerhouse. The SMP comprises a real-time sediment monitoring program, which is being implemented for in-stream construction activities in the Nelson River, throughout construction.

This report summarizes the results for the sediment monitoring that took place during in-stream construction in the Nelson River from April 2019 to March 2020.

1.1 CONSTRUCTION SUMMARY

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams in the north and central channels of Gull Rapids (Figure 1). These cofferdams resulted in the dewatering of the north and central channels and the diversion of all flow to the south channel. Construction of the Spillway Cofferdam (SWCD), which extends into the south channel of Gull Rapids, was completed in 2015. The rock placement for the inner and outer groins of the Tailrace Cofferdam (TRCD) started in late 2016 and the impervious fill placement was completed in fall 2017. An opening was created to allow fish to move freely over the winter of 2017–2018. The opening was closed in spring 2018 and dewatering of the TRCD occurred in July, at which time a fish salvage was completed. In preparation for commissioning of the spillway, the SWCD was watered-up on both sides of the structure in June 2018. Removal of the SWCD started in early July and continued into August. The spillway was commissioned

between August 3 and 7, 2018. Closing the south channel with the upstream South Dam Cofferdam (SDCD) commenced at the beginning of August 2018 and river closure was achieved on August 16. This closure and the work that continued to seal the cofferdam forced the entire river flow through the spillway. The downstream SDCD was completed in September and the area between the two cofferdams was dewatered, allowing for fish salvage to be completed by late September 2018. Work continued on the upstream SDCD until it was completed in late fall 2018.

During the period of April 2019 to March 2020, most of the construction activity occurred in the dry. Water-up (transfer of water into work areas contained by permanent and temporary structures) began in February 2020. This was followed by lowering / removal of the North Channel Cofferdam, Island Cofferdam and North Channel Rock Groin. Partial removal of the Powerhouse Tailrace Cofferdam was also completed during this time.

As in previous years, an ice boom was installed in Gull Lake to assist in the formation of a stable ice cover.

1.2 FLOWS AND WATER LEVELS

Nelson River flows were near median flow levels between about 3,000-3,500 m^3/s through much of 2019 until about the beginning of October. Flows increased into the winter season, rising to the 95th percentile flow levels between about 4,000-4,400 m^3/s and flows remained elevated through the winter.

Steady flows over much of the summer in 2019 resulted in steady water levels until early October. Water levels increased through October as flows also increased. While flows continued to gradually increase in November, the initiation of an ice cover early in the month also caused water levels to start increasing more sharply than usual at that time of year. Peak winter levels were generally reached in January 2020 and, depending on the location, levels began to decline around the beginning of February in upstream areas, and later in the month in downstream areas.

On February 26, the spillway gates were operated to raise water levels immediately upstream to water-up (i.e., flood) the dewatered work area immediately upstream from the powerhouse. This resulted in Gull Lake water levels rising between 0.2-0.3 m to an elevation of about 156.5 m. Once water-up of the dewatered area was complete, the level dropped to about 156 m as temporary river management structures were lowered or removed. Following that, the spillway was again used to raise upstream levels for removal of the North Channel Rock Groin, which again increased Gull Lake to about 156.5 m, where it remained up to the end of March.

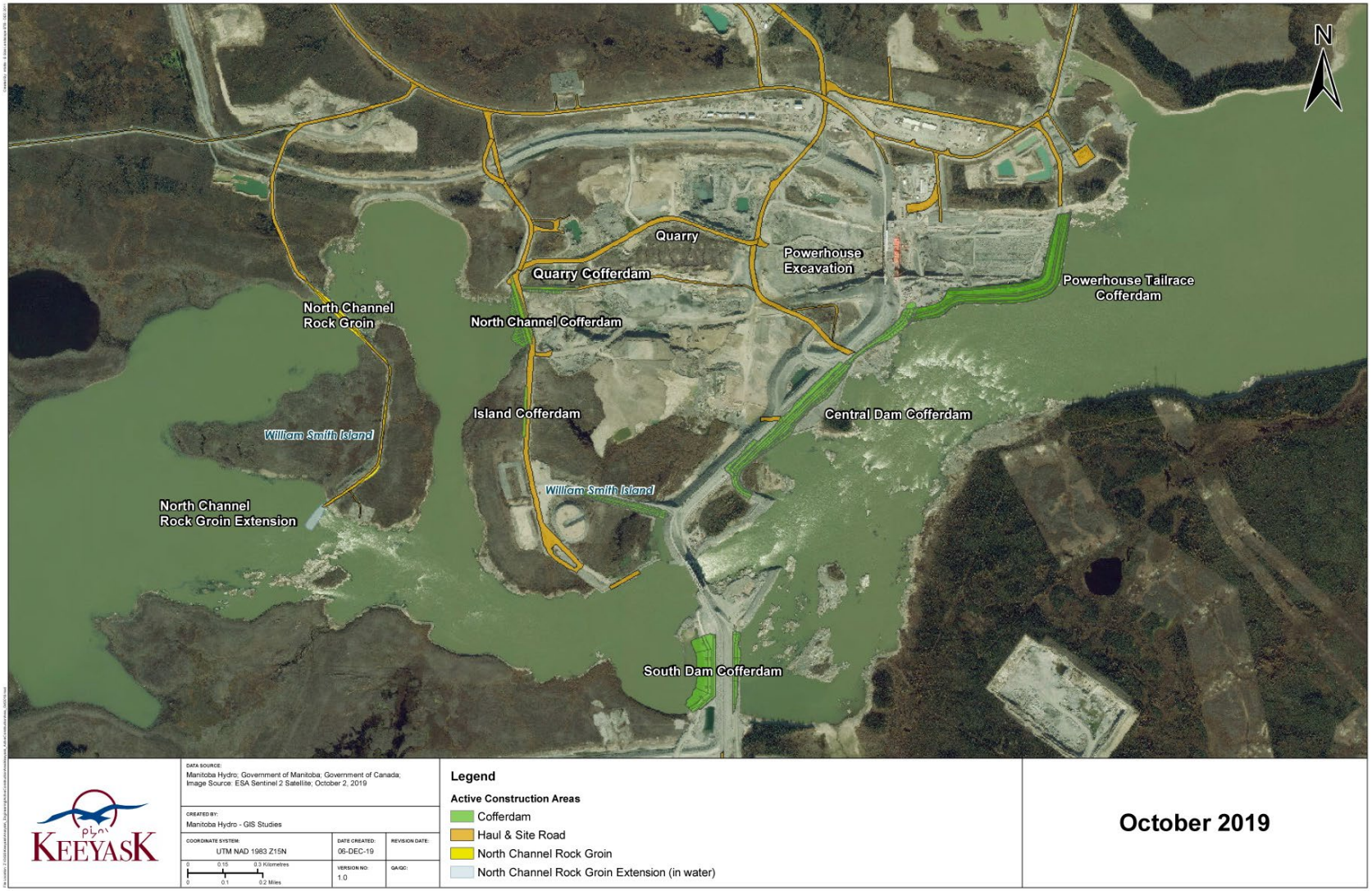

Figure 1: Map of the Keeyask Generating Station site, October 2019

2.0 SEDIMENT MONITORING PROGRAM

As part of the Keeyask Generation Station Project, a detailed real-time sediment monitoring program was developed for the construction phase to monitor sediment inputs from in-stream construction activities in the Nelson River. The *Keeyask Generation Project Sediment Management Plan for In-stream Construction* (SMP) (KHLP 2014) outlines the monitoring and management of Total Suspended Solids (TSS) that may occur because of in-stream construction and commissioning of the Spillway and the Powerhouse.

Turbidity (Tu) is monitored using turbidity loggers at three locations (with a total of five monitoring stations). The turbidity data are converted to TSS values based on the derived relationship between Tu and TSS, as explained in the SMP. Monitoring locations are discussed in more detail in sections 2.1, **Error! Reference source not found.**, and 2.3.

The monitoring locations are consistent with the baseline monitoring sites that were used in the environmental assessment studies. While it is intended that monitoring be undertaken at these locations, the actual locations may be adjusted in the field based on factors such as the safety of personnel and equipment, accessibility, and ambient conditions (*e.g.*, high river flow, high water velocity, unsafe ice).

2.1 OPEN WATER MONITORING STATIONS

During the month of June 2019, the open water monitoring stations were installed on the Nelson River. Five monitoring stations (SMP-1, SMP-2L & SMP-2R, SMP-3L & SMP-3R) were deployed as outlined in the SMP to collect turbidity data for the Project. A backup station (SMP-1A) was installed near SMP-1 as a precaution, so background data would be continuously available if SMP-1, which is the sole upstream monitoring station, failed or became damaged. At each station, sensors were installed two meters below the water's surface (designated TSSS) and two meters above the bottom of the channel (designated TSSB). Figure 2 shows the location of each of the SMP open water monitoring stations. The stations are described in more detail below:

- SMP-1 is located upstream of all construction activities in the Nelson River and monitors ongoing background conditions.
- SMP-2 is located approximately 1.5 km downstream of the future Powerhouse. Data loggers are installed on the left and right sides of the channel (SMP-2L and SMP-2R). This location was chosen, as it is a near-field location within the mixing zone prior to fully mixed conditions.
- SMP-3 is located approximately 9 km downstream from the construction site in the fully mixed zone of the primary flow channel, along the deepest part of the river. This location was chosen because most of the flow passes through this south channel and it is where

increases in TSS will mostly occur. Data loggers are installed on both the left and right sides of the channel (SMP-3L & SMP-3R).

Open water monitoring equipment was removed in fall 2019, near the end of the open water season, on the following days:

- SMP-1 on September 23; and
- SMP-2L, SMP-2R, SMP-3L, SMP-3R on September 29.

Since construction began, flow velocities have increased at the site of SMP-2R, likely due to changes in the river's flow pattern driven by the presence of the Project. The station's location has been moved roughly 450m downstream of the original site due to multiple capsize events in previous years.

2.2 SHOULDER SEASON MONITORING

Shoulder season monitoring was not implemented in 2019 because efforts in previous years to monitor TSS during the ice on and off transition periods have not been successful. Each year, moving ice has destroyed the communication cables between the in-stream turbidity sensors and the data loggers installed on shore.

2.3 WINTER MONITORING STATIONS

The SMP describes modifications to the open water program required in winter when ice is present.

Monitoring stations were in place upstream at SMP-1 and downstream at SMP-3 during the winter of 2018/2019; however, monitoring equipment was not installed at SMP-2 due to unfavorable ice conditions that would cause interference with instrumentation. The equipment was removed in the middle of April, 2019.

In winter 2019/2020, SMP-1, SMP-2, SMP-3L and SMP-3R were installed in January and were still in place at the end of the reporting period (Figure 3). SMP-2 was relocated further downstream in an effort to track any sediment events to the north of the main flow of the Nelson River.

Figure 2: Open water monitoring stations for the Keeyask Sediment Management Plan

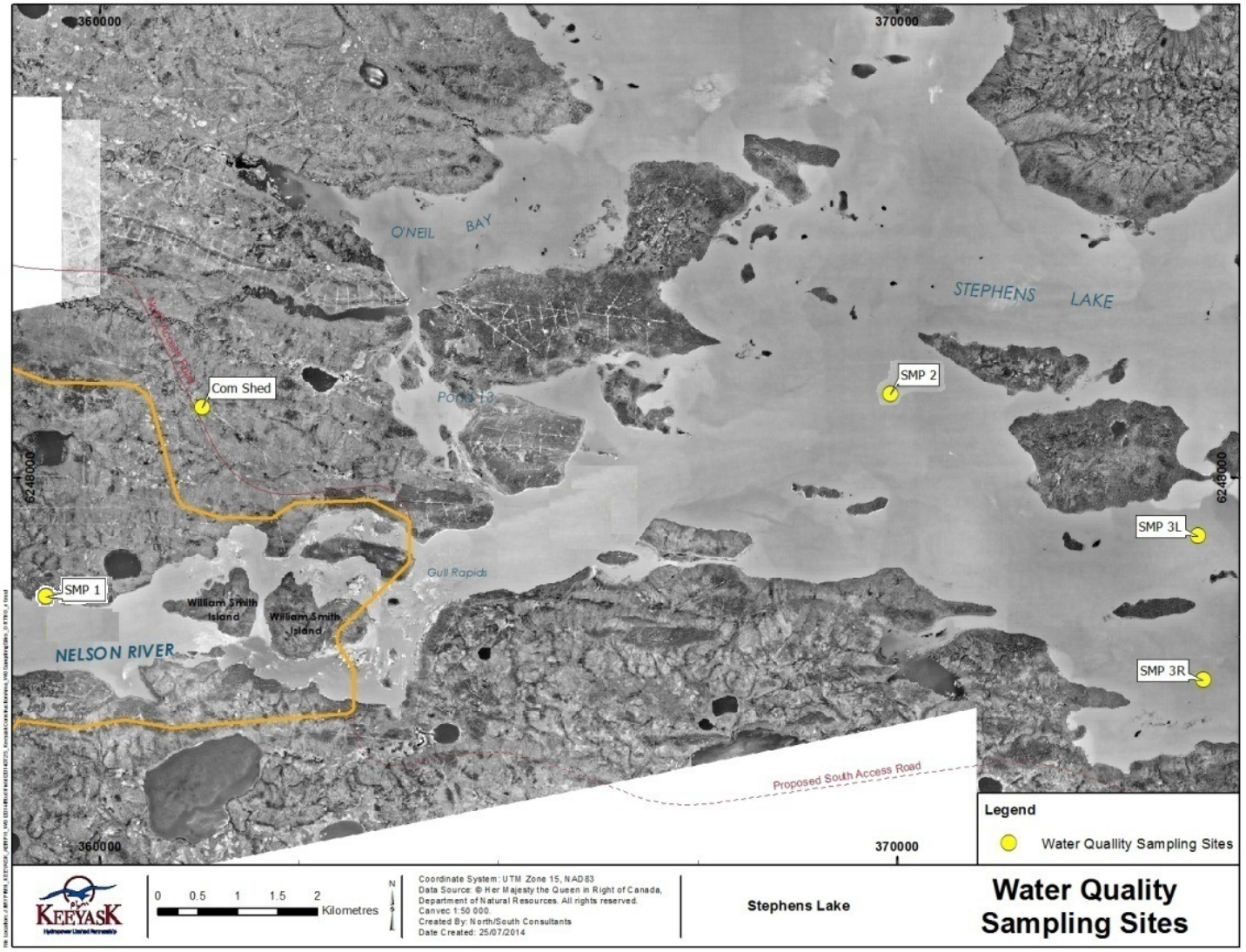

Figure 3: 2019/2020 Winter SMP monitoring station locations

2.4 ACTION AND TARGET LEVELS

As outlined in the SMP, the management of TSS levels during construction incorporates two action levels measured in the mixing zone at SMP-2:

1. Four, consecutive, 15-minute averaged measurements over 25 mg/L above background TSS at monitoring site SMP-1; and
2. One, 15-minute averaged increase of 200 mg/L above background TSS at monitoring site SMP-1.

Both action levels are below acutely lethal thresholds of TSS for freshwater fish, which range from hundreds to hundreds of thousands of mg/L. The action levels at SMP-2 are set such that action is initiated to reduce construction sediment inputs, to maintain a 24-hour average increase of 25 mg/L or less at SMP-3, relative to SMP-1 (background TSS).

An exceedance of these action levels initiates an investigation to identify the source of the TSS, implement secondary mitigation strategies for unanticipated events, and/or modify in-stream construction procedures as outlined in the SMP.

2.5 MANUAL SAMPLING

2.5.1 TURBIDITY /TSS RELATIONSHIP VALIDATION

As outlined in the SMP, the *in-situ* turbidity logger data measured at each monitoring site and the relationship used to calculate TSS from turbidity were confirmed through manual monitoring of turbidity using handheld loggers and collecting water samples for TSS analysis at the same time. Manual sampling in the summer season began in June and ended in late-September of 2019; manual sampling was carried out in the winter between January and March, 2020. Turbidity measurements and TSS samples were collected near the surface, middle, and bottom of the water column near each SMP monitoring station. The results of the manual sampling conducted are provided in Table 1 and Table 3.

2.5.2 DETECTING SEDIMENT PLUMES IN THE MIXING ZONE

To confirm the SMP-2 stations (*i.e.*, left and right locations) were positioned such that the deployed loggers would detect an increase in turbidity from any passing sediment plumes, turbidity measurements were taken along a cross section of the river at twenty sites near SMP-2. Discreet measurements were collected along the transect once during the open water season (Figure 4). Measurements were taken along the transect when work was not occurring (June 19, 2019; Table 2). No measurable variation in the turbidity was detected across the river to indicate

a plume was present. Given that no extensive in-stream work took place during the open water season of 2019, monitoring a second time was not carried out. In-stream construction resumed in February 2020, however, taking discreet measurements along a transect was not possible due to ice cover.

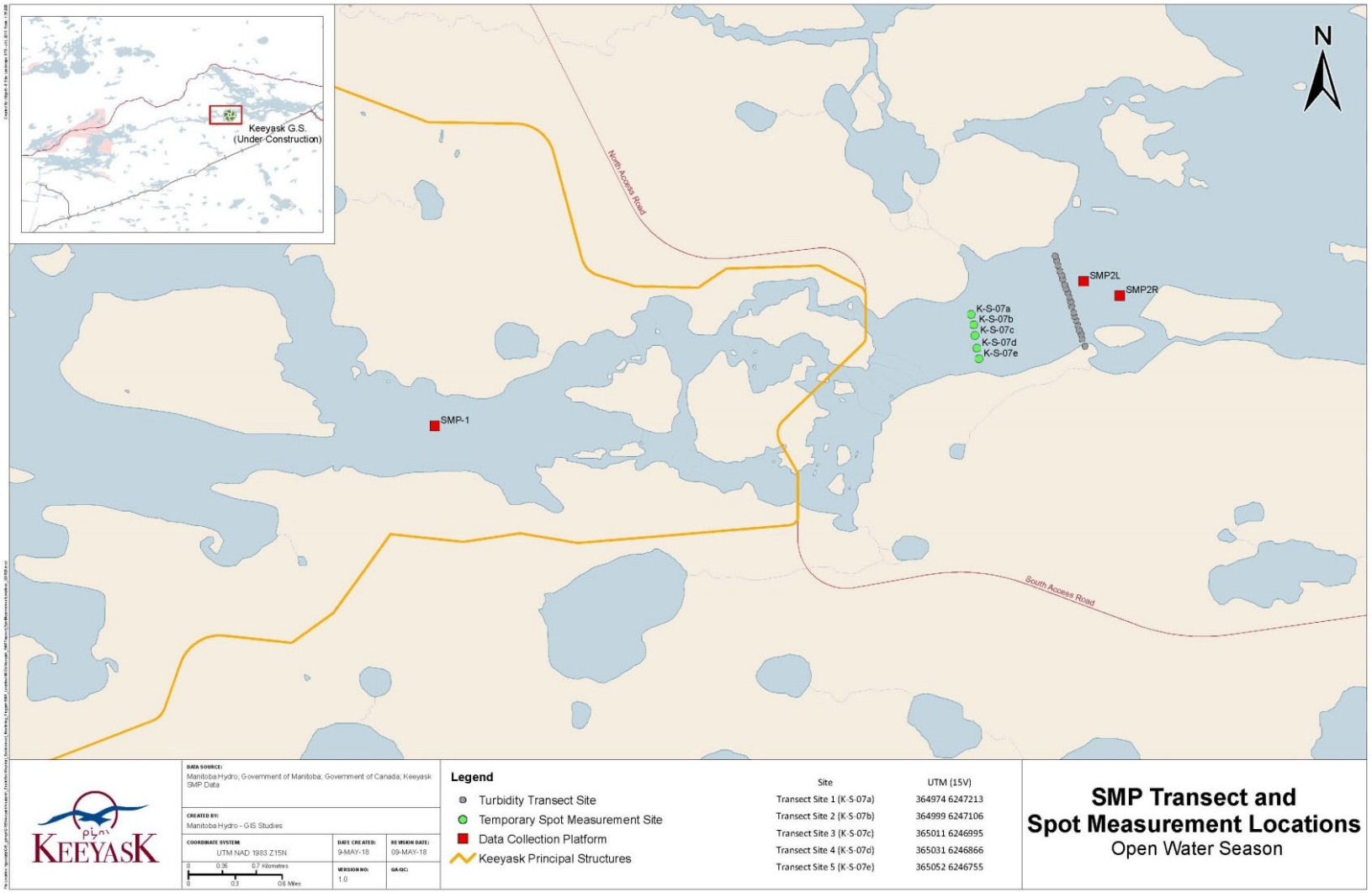

Figure 4: Map of cross-section turbidity transect just upstream of SMP-2 (June 19, 2019), as well as spot measurement sites (K-S-07) from previous years.

3.0 IN-STREAM WORK

3.1 SOUTH DAM FINGER DRAINS

Finger drains were constructed between August 28-30, 2019 at four locations along the downstream side of the South Dam to promote drainage (Figure 5). These drains are a permanent feature of the structure. There were no measurable changes to the TSS in the river during this time frame (Figure 6 and Figure 7).

Figure 5: Geotextile is placed while constructing a finger drain at the South Dam

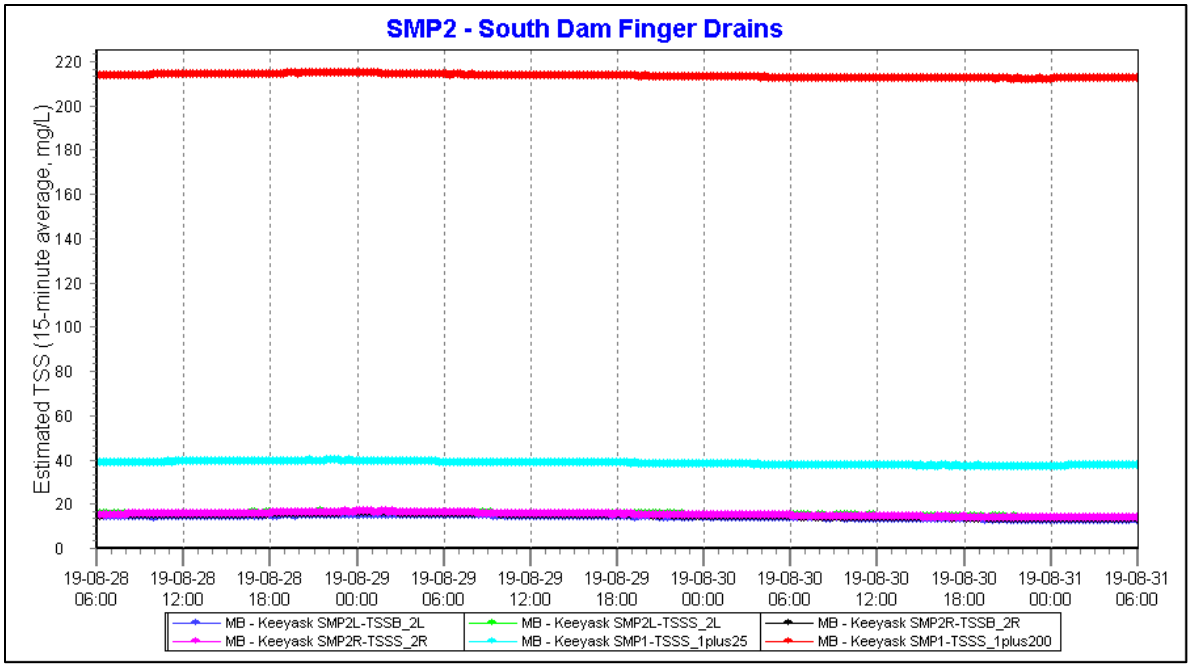

Figure 6: **Total suspended solids (TSS) values (15-minute average, mg/L) from August 28, 2019 through August 30, 2019 at monitoring stations SMP-2L and SMP-2R compared with the SMP action levels, which are shown in light blue and red.**

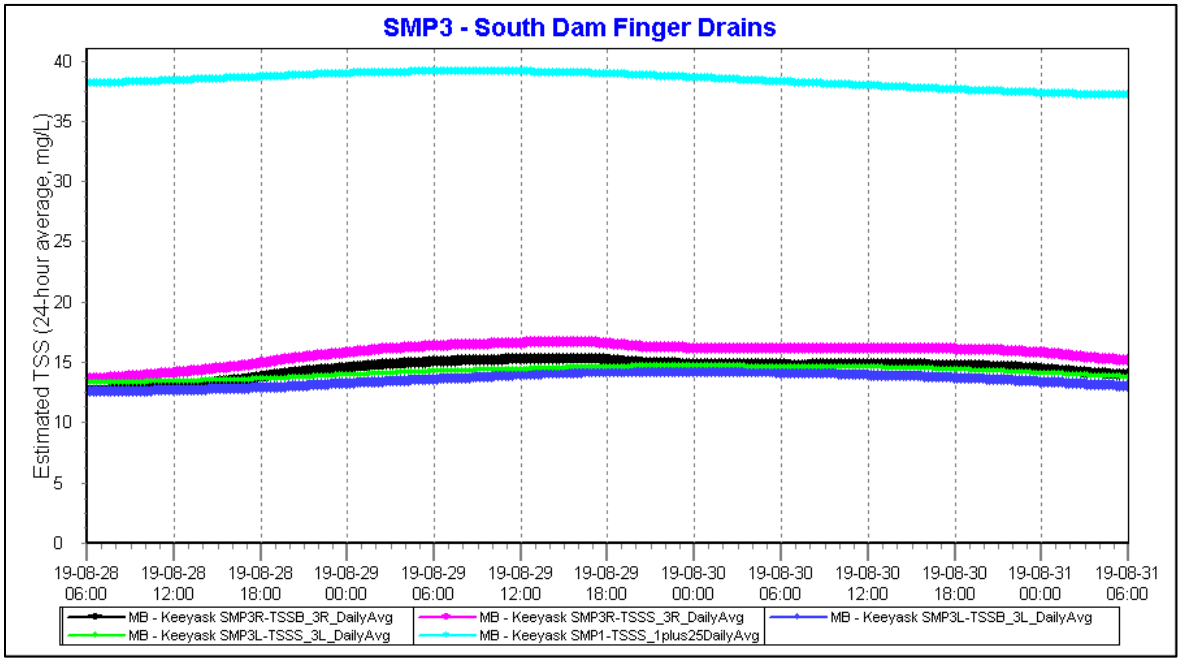

Figure 7: **Total suspended solids (TSS) values (24-hour rolling average, mg/L) from August 28, 2019 through August 30, 2019 at monitoring stations SMP-3L and SMP-3R compared with the action level, which is shown in light blue.**

3.2 NORTH CHANNEL ROCK GROIN EXTENSION

The North Channel Rock Groin (NCRG) was re-installed from October 26 to November 7, 2019 (Figure 8) to counteract the increasing Nelson River inflows and promote the formation of an ice cover in concert with the Keeyask ice booms. The SMP real-time monitoring stations were not deployed, nor was it possible to safely take spot measurements downstream. There were no sediment plumes observed during this work.

Figure 8: An excavator places large rockfill delivered by a haul truck into the river for the NCRG Extension

3.3 NORTH CHANNEL ROCK GROIN REMOVAL

The North Channel Rock Groin (NCRG) was constructed in 2014 and can be seen in Figure 1. Removal of the NCRG occurred between March 21 and April 9, 2020 (Figure 9).

Figure 9: Excavation of the NCRG. Photo taken facing northwest on March 27, 2020.

There were no significant sediment plumes observed while the NCRG was being removed and no detectable change in the TSS measured by the SMP sensors as a consequence of this work (Figure 10 and Figure 11).

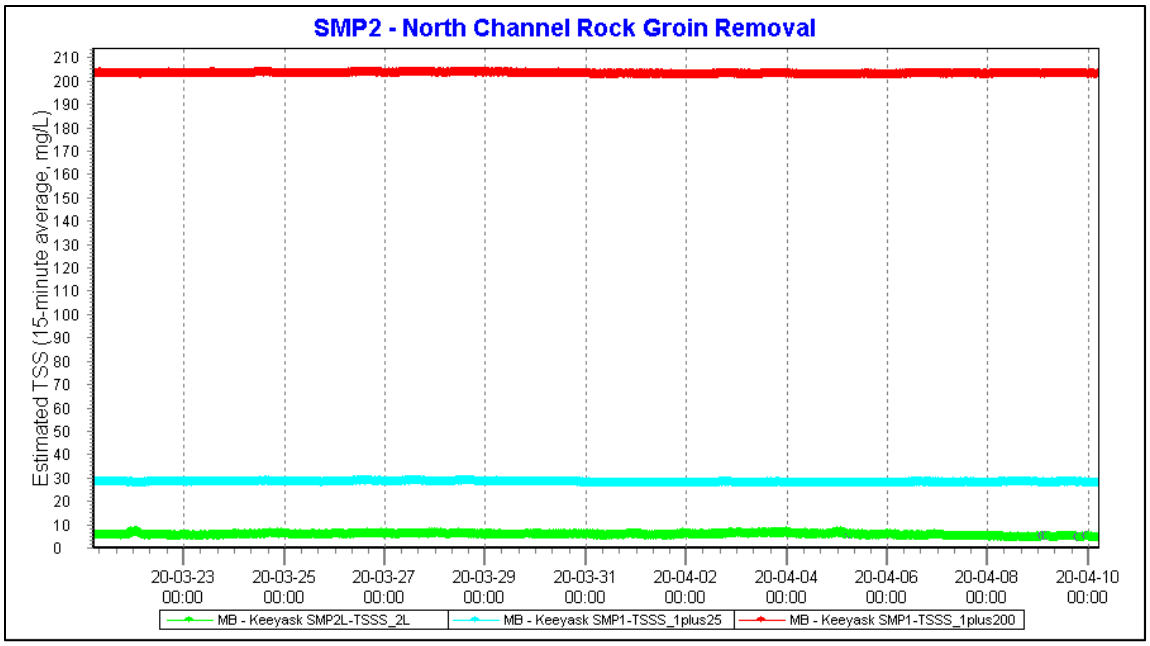

Figure 10: Total suspended solids (TSS) values (15-minute average, mg/L) from March 22, 2020 through March 31, 2020 at monitoring station SMP-2L compared with the action levels, which are shown in light blue and red.

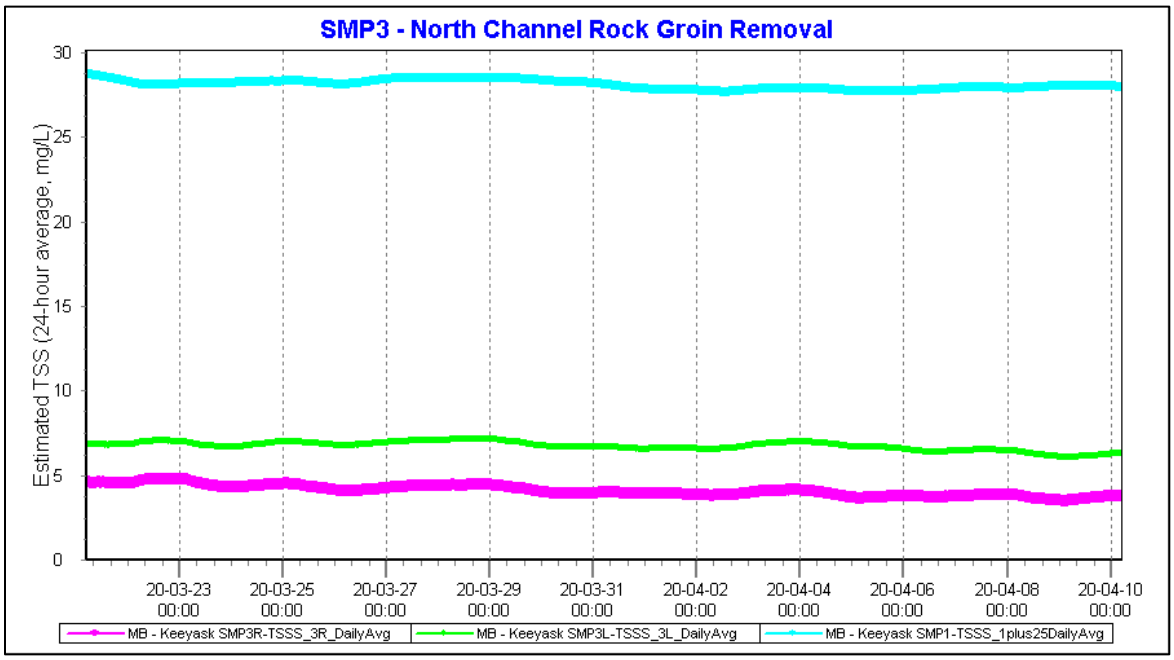

Figure 11: Total suspended solids (TSS) values (24-hour rolling average, mg/L) from March 21, 2020 through March 31, 2020 at monitoring stations SMP-3L and SMP-3R compared with the action level, which is shown in light blue.

3.4 TAILRACE COFFERDAM REMOVAL

Work was conducted within the confines of the Tailrace Cofferdam (TRCD) after its construction in 2018, and included the removal of the Powerhouse Cofferdam, construction of the tailrace sturgeon spawning shoals and shaping the tailrace discharge channel in accordance with the final design specifications.

Prior to removing the cofferdam, water levels were equalized on both sides of it by pumping water into the area bounded by the TRCD using sumps that were installed within the turnouts.

The TRCD has an inner and outer rock groin, and between the groins is a central core of semi-pervious and impervious material. Removal of the TRCD in the wet began on March 12, 2020. During the removal of the core material, which consists of fine material, a small sediment plume could be seen in the river (Figure 12). Care was taken to reduce the fine material from being carried away in the current by removing the core in advance of the rock groins to maintain a less turbulent area between the two (Figure 13). No measurable change in the river TSS levels were detected downstream by the SMP sensors (Figure 14 and Figure 15). The TRCD removal continued after March 31, 2020.

Figure 12: Removal in the wet of the TRCD. A small sediment plume can be seen on the right side of the photo. Photograph taken facing northeast, March 13, 2020

Figure 13: Removal of the TRCD facing west towards the Powerhouse. The inner and outer groins can be seen protruding past the core material, which was taken out first to minimize the suspension of the fine material. Photo taken on April 19, 2020.

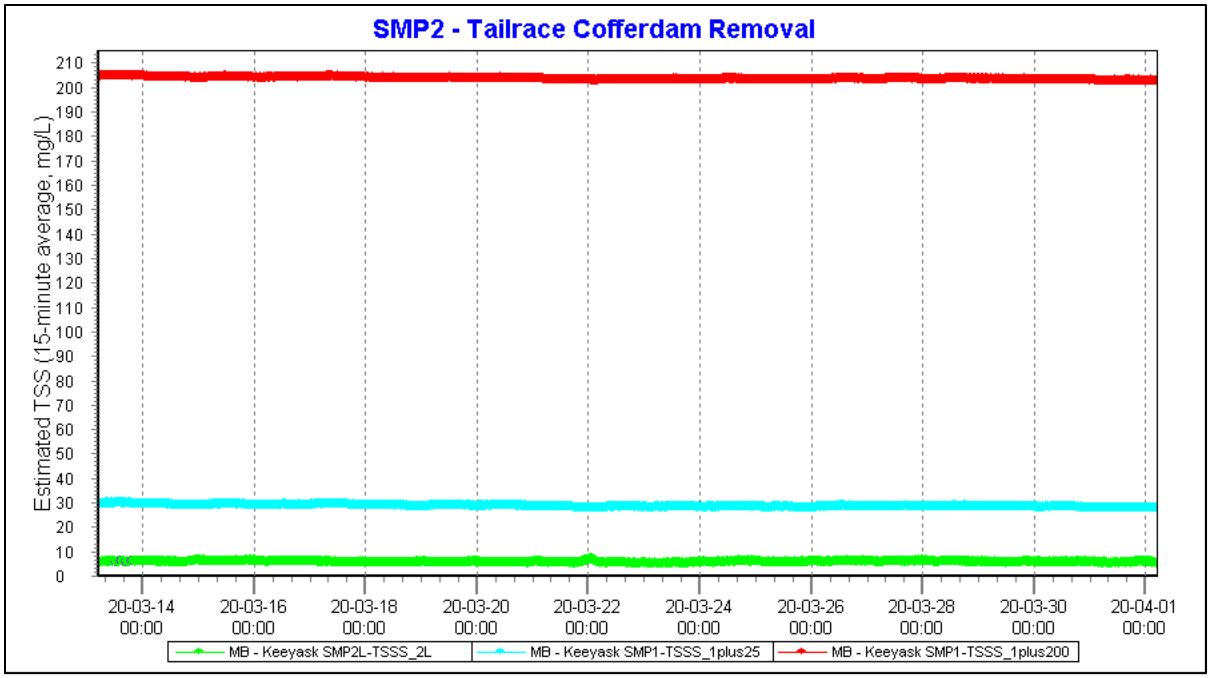

Figure 14: **Total suspended solids (TSS) values (15-minute average, mg/L) from March 13, 2020 through March 31, 2020 at monitoring station SMP-2L compared with the action levels, which are shown in light blue and red.**

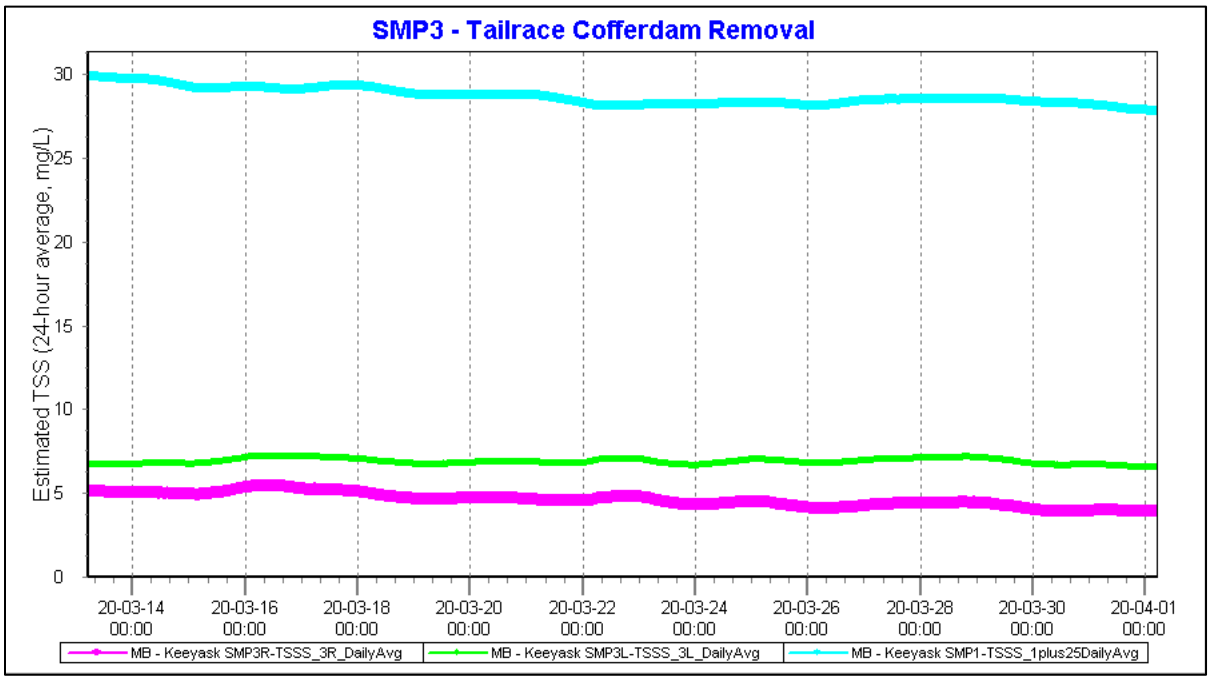

Figure 15: **Total suspended solids (TSS) values (24-hour average, mg/L) from March 13, 2020 through March 31, 2020 at monitoring stations SMP-3L and SMP-3R compared with the action level, which is shown in light blue.**

3.5 NORTH CHANNEL COFFERDAM REMOVAL

The North Channel Cofferdam (NCCD) was constructed in 2015 and consists of larger class rock on the outer berms, with a semi-impervious core constructed of fine silts and sands.

Excavation of the NCCD in the wet commenced on March 13 and continued until March 20, 2020. Numerous excavators were used to conduct the work, starting on the upstream side (Figure 16) and moving to the downstream side. (Figure 17). There was no measurable effect on instream TSS levels measured by the SMP sensors during the work (Figure 18 and Figure 19).

Figure 16: Removal of the NCCD. Photo facing south and taken March 13, 2020.

Figure 17: Removal of the NCCD after completion. The photo was taken facing north on March 20, 2020.

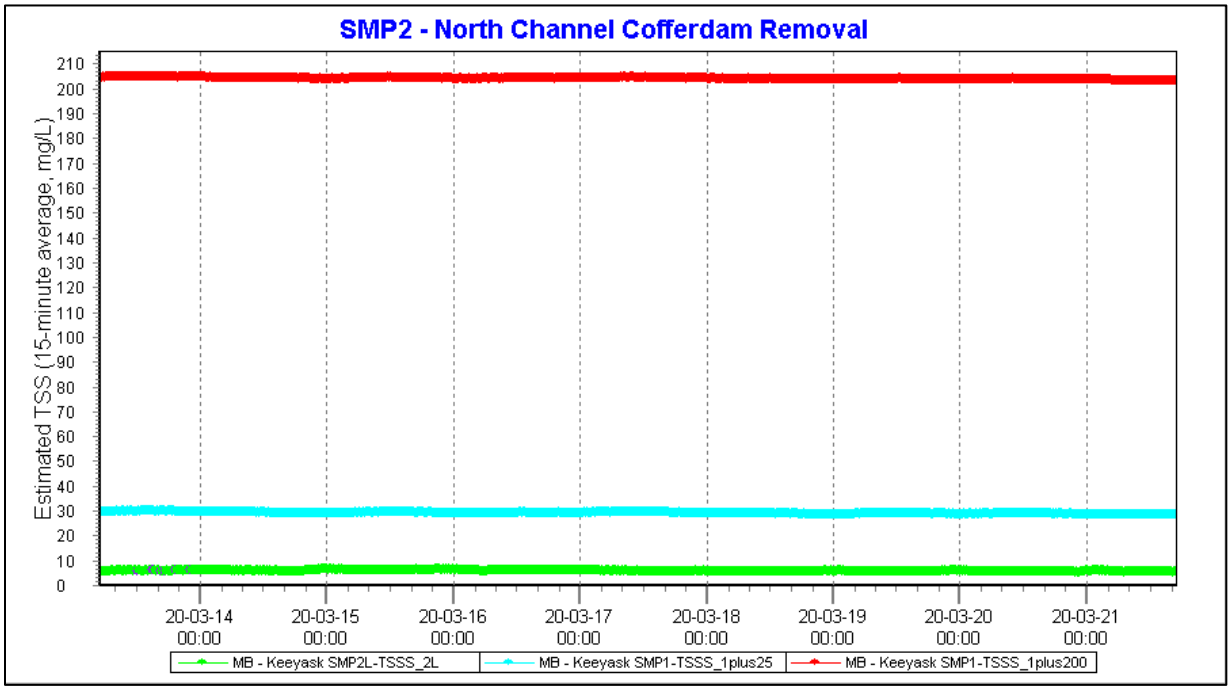

Figure 18: Total suspended solids (TSS) values (15-minute average, mg/L) from March 13, 2020 through March 21, 2020 at monitoring station SMP-2L compared with the action levels, which are shown in light blue and red.

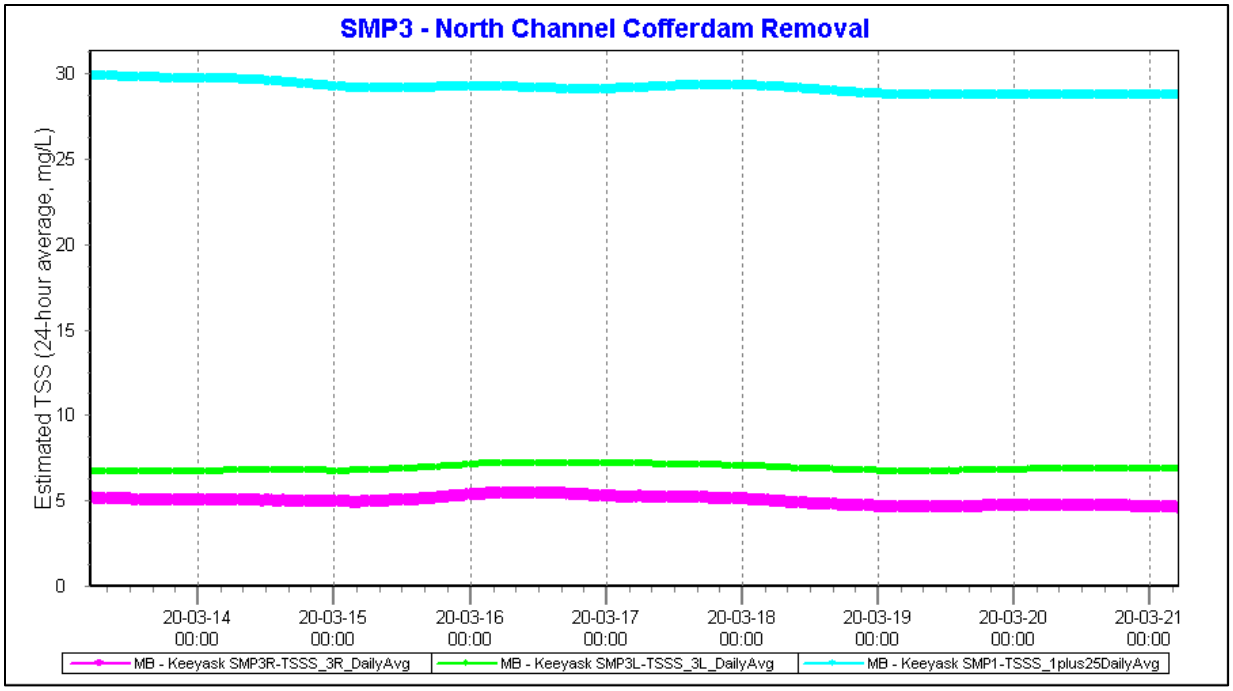

Figure 19: Total suspended solids (TSS) values (24-hour rolling average, mg/L) from March 13, 2020 through March 20, 2020 at monitoring stations SMP-3L and SMP-3R compared with the action level, which is shown in light blue.0

4.0 PREDICTED VS. OBSERVED EFFECTS ON IN-STREAM TSS

As described in the SMP, river management during construction will introduce additional sediment into the Nelson River due to shoreline erosion, construction and removal of cofferdams, and commissioning of the Spillway and the Powerhouse. The predicted effects of in-stream construction presented in the SMP (Figure 20) were based on the proposed construction timeline at the time that the analyses were performed and assumed fully mixed conditions at SMP-2.

4.1 PREDICTED EFFECTS

The predicted effects of removing the upstream cofferdams and rock groin were expected to produce locally elevated TSS near where the work was occurring. Since the sediment would mix rapidly when it reached the main flow and as it passed through the Spillway, there were no discernable effects predicted downstream.

The potential effects on TSS from the removal of the Tailrace Cofferdam (TRCD) are outlined in the Sedimentation section of the Physical Environment Supporting Volume that was part of the Keeyask EIS (KHLP 2012) (Figure 20).

On January 10, 2020, a request was submitted to modify the *Fisheries Act* Authorization, specifically to conduct in-stream work to lower/remove the TRCD, NCCD, Island Cofferdam (ICD) and NCRG during Fisheries and Oceans Canada's (DFO) restricted activity timing windows for work in northern Manitoba. As part of the submission, the potential effects of removing structures on in-stream TSS were considered. Based on previous estimates and previous experience while removing the Spillway Cofferdam, the effects of removing the NCCD, ICD and NCRG were not predicted to cause discernible effects on the TSS (turbidity) at the downstream SMP monitoring sites. More detailed analyses and sediment transport modeling was performed to consider the potential effects of TRCD removal. The analysis considered that the TRCD construction was different than what was considered in previous estimates; specifically, the finer core material was better protected from exposure to flow than originally assumed. The analysis concluded that in-stream TSS increases of 5 mg/L or more, would be confined to areas within about 100 m of the work area. The effects were predicted to dissipate to less than 1 mg/L above the river's baseline TSS at the downstream SMP monitoring sites.

In addition to in-stream work to remove the aforementioned structures, water-up (transfer of water into work areas contained by permanent and temporary structures) commenced in February 2020. Upstream water level increases varied, rising a few meters at the spillway and about 0.2-0.4 m on Gull Lake. Water-up resulted in new flooding of terrestrial areas, particularly between the dam and the head of Gull Rapids where larger water level increases occurred. This

flooding has the potential to add sediment to the river, however the potential effects were estimated as they cannot be reasonably quantified.

4.2 OBSERVED EFFECTS

As noted in Section 2.3, continuous turbidity monitoring equipment was deployed at sites SMP-1, SMP-2, SMP-3 and SMP-3R in January 2020 and monitoring was performed at these sites to the end of the reporting period on March 31. The continuous turbidity data were used to estimate continuous TSS concentrations based on the turbidity to TSS relationship used for the SMP. For each site, the continuous monitoring results were first reviewed to remove erroneous data (e.g., due to equipment malfunction). The continuous TU data and calculated TSS values were then compared with the discrete turbidity readings and laboratory measured TSS concentrations obtained from periodic site visits and water sampling (Table 33). The comparison noted some deviations between the continuous TU and TSS levels and the data were adjusted to get better agreement between the continuous and discrete TSS. Portions of the few weeks of SMP-2 and SMP-3L TU data available needed to be shifted down by about 9 NTU and 6 NTU, respectively as values were markedly different from other continuous and discrete data, which may occur with a calibration error. Other adjustments were smaller, with continuous turbidity levels being adjusted from +1 NTU to -2 NTU.

The calculated, continuous TSS concentrations at the four monitoring sites were compared (Figure 21) to determine if there were any apparent effects due to construction activities. Construction activity began on February 26 with the start of water-up; the effects of water-up on water levels remained through to the end of the reporting period. From the start of winter monitoring through about the first week of February, the calculated TSS at sites SMP2 and SMP-3R declined from about 7-10 mg/l to about 5-6 mg/l. At the same time, there were TSS increases from about 3-4 mg/L to about 5-6 mg/L at SMP-1 and SMP-3L. Over the next couple weeks, the TSS at sites SMP-2, SMP-3L and SMP-3R remained at about 5-6 mg/L. While the TSS at SMP-1 dropped to about 4 mg/L during this period (a discrete reading from this period was about 4.8 mg/L), it rose to about 5-6 mg/L before water-up began.

From February 23, prior to water-up, through about March 20, the calculated TSS at the four sites remained between about 4.5-6 mg/L, and the difference between sites was less than 1 mg/L, and often less than 0.5 mg/L (Figure 21). Based on these results, there were no apparent impacts to TSS during water-up, TRCD removal, or NCCD removal, either individually or combined.

From March 20-31, the calculated TSS at SMP-1 and SMP-3R was generally 4-4.5 mg/L, while sites SMP-2 and SMP-3L were roughly 1-1.5 mg/L higher, between about 4.5-6 mg/L. It is noted that the deviations between the two sites with lower TSS and the two with higher TSS remained relatively consistent. If the 1-1.5 mg/L difference was due to in-stream construction, it would be anticipated that the TSS at the affected sites (i.e. SMP-2 and SMP-3L) would have fluctuated with work starts and stoppages, and the TSS would decrease towards to the TSS at SMP-1 and

SMP-3R when no work was occurring. The deviation also does not appear to result from flooding due to water-up because that would be expected to affect the 3 downstream sites similarly, which does not appear to be the case.

Based on the TSS results observed, it is clear the initial estimate of the effects of TRCD removal were overly conservative. Generally, the observed results do not clearly suggest there were effects that resulted from in-stream construction activity as the deviations were relatively small and not unlike the deviations that were observed when no construction activity was occurring. Also, the pattern of the TSS differences does not seem to reflect work starts and stoppages. Overall, to the extent in-stream construction may have increased TSS at the downstream monitoring sites, the effect was likely less than a 1 mg/l change, which is expected based on the most recent estimates.

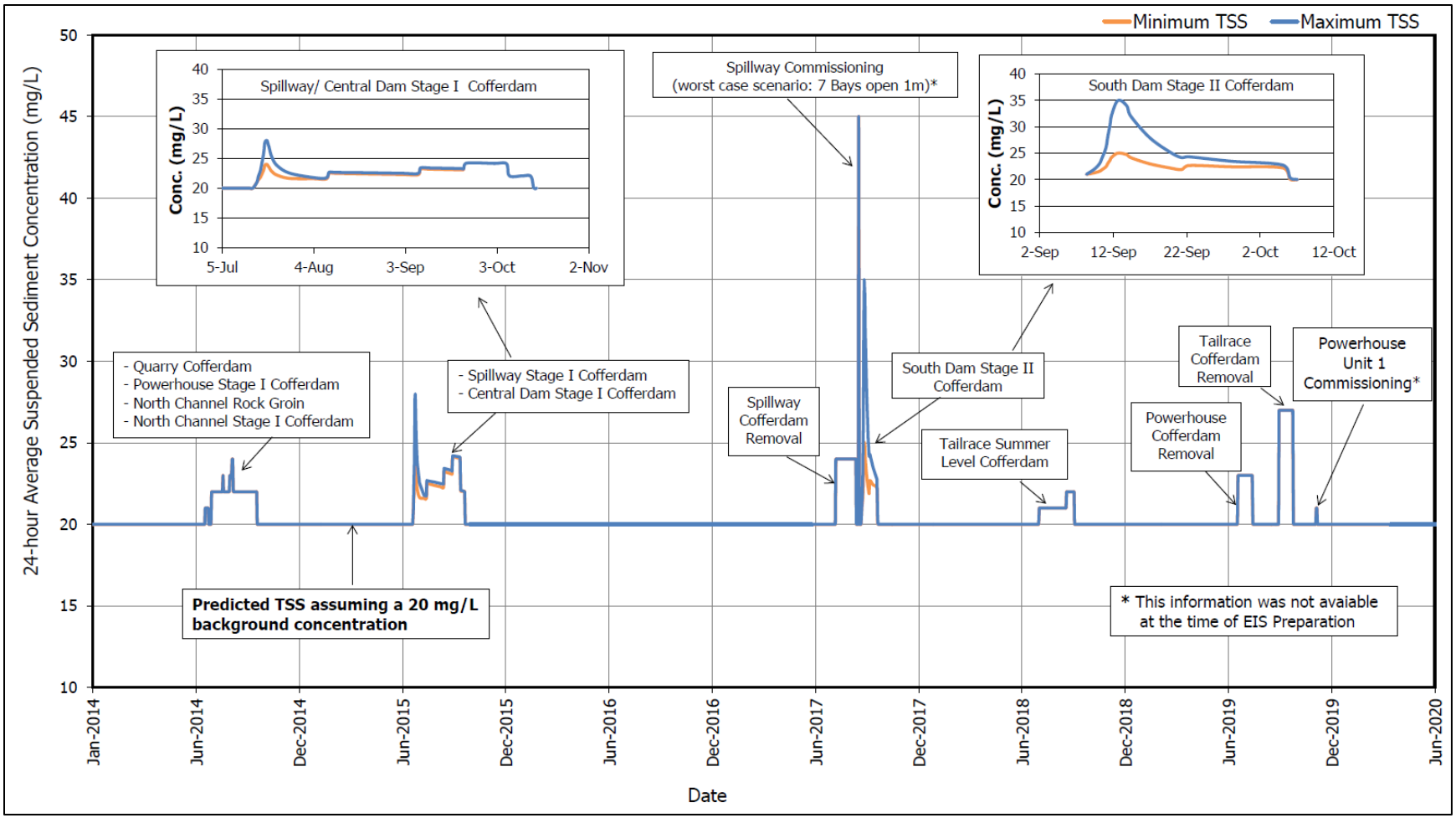

Figure 20: Fully Mixed 24-Hour Average TSS Concentration Predicted in the Proximity of Site SMP-2 (mixing zone) During Construction of the Keeyask GS (based on 2012 construction schedule).

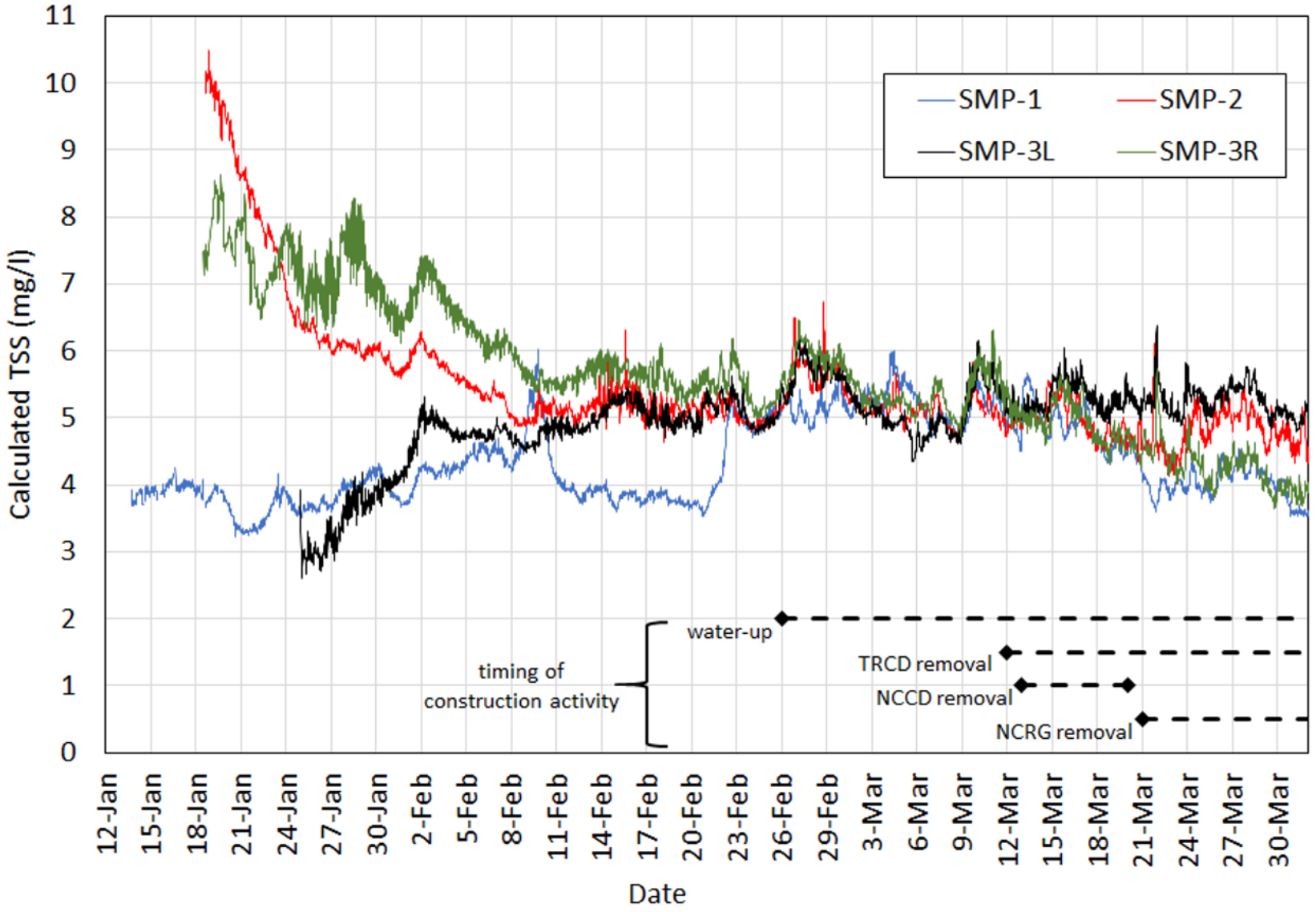

Figure 21: The continuous TSS calculated from continuous turbidity measurements from January to March 2020

5.0 CONCLUSIONS

During the SMP monitoring period from April 2019 to March 2020, there were no exceedances of the SMP action levels attributed to the in-stream construction activities that took place.

There were some occasions when the real-time TSS results showed the action levels were exceeded, but further investigation proved these occurred because of malfunctioning wipers, interference during maintenance, vegetation on a sensor or the anchor of the sensor stirring up the sediment.

Construction of the North Channel Rock Groin Extension and South Dam Finger Drains, as well as the lowering/removal of the North Channel Cofferdam, Island Cofferdam, Tailrace Cofferdam and North Channel Rock Groin did not cause exceedances of the SMP action levels in 2019/2020, and downstream effects on in-stream TSS were minor to negligible, as predicted.

6.0 LITERATURE CITED

Keeyask Hydropower Limited Partnership (KHLP), 2012. Keeyask Generation Project: Physical Environment Supporting Volume. June 2012. Winnipeg, Manitoba

Keeyask Hydropower Limited Partnership. 2014. Keeyask Generation Project Sediment Management Plan for In-stream Construction. Winnipeg, Manitoba. June 2014.

TABLES

Table 1: Manual sampling water quality monitoring data for the 2019 open water season

Station ID	Date (D/M/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-01	6/22/2019	10:13	7.9	2.01	17.7	11.12	9.04
	6/22/2019	10:15	7.9	2.12	17.1	10.65	9.43
	6/22/2019	10:16	7.9	3.94	17.2	10.73	10.9
	6/22/2019	10:17	7.9	3.68	17.3	10.81	8.9
	6/22/2019	10:18	7.9	6.19	17.4	10.89	7.2
	6/22/2019	10:24	7.9	6.31	17.1	10.65	7.6
	7/06/2019	14:11	7.8	2.1	19.6	12.62	17.4
	7/06/2019	14:14	7.8	2.2	20.3	13.18	14
	7/06/2019	14:16	7.8	3.9	20.7	13.49	13.4
	7/06/2019	14:16	7.8	3.8	20.7	13.49	12.1
	7/06/2019	14:17	7.8	5.7	21.1	13.81	16.1
	7/06/2019	14:19	7.8	6.2	21.2	13.89	12
	7/24/2019	14:21	7.6	2.1	22.7	15.07	10.1
	7/24/2019	14:22	7.6	2.1	22.1	14.60	9.98
	7/24/2019	14:23	7.6	3.8	22.2	14.68	14.1
	7/24/2019	14:24	7.6	3.4	22.7	15.07	14.8
	7/24/2019	14:25	7.6	5.5	22.8	15.15	10.9
	7/24/2019	14:26	7.6	5.8	22.9	15.23	10.6
	8/14/2019	10:42	7.6	2.221	23.9	16.02	11.8
	8/14/2019	10:43	7.6	2.268	23.7	15.86	13.2
	8/14/2019	10:43	7.6	3.721	24.1	16.18	10
	8/14/2019	10:44	7.6	4.078	23.7	15.86	9.3
	8/14/2019	10:45	7.6	5.515	24.1	16.18	12.5
	8/14/2019	10:46	7.6	5.743	24.6	16.57	13.3
	8/24/2019	14:00	7.9	2.152	4.9	1.01	9.16
	8/24/2019	14:01	7.9	1.888	18.7	11.91	10.1
	8/24/2019	14:02	7.9	4.066	18.8	11.99	9.42
	8/24/2019	14:02	7.9	4.072	18.9	12.07	9.34
	8/24/2019	14:03	7.9	5.93	18.8	11.99	11.2
	8/24/2019	14:04	7.9	5.482	18.8	11.99	10.7
	9/07/2019	14:13	7.6	2.022	18.1	11.44	11.1
	9/07/2019	14:14	7.6	2.11	18.2	11.52	13.2
	9/07/2019	14:16	7.6	3.723	18.2	11.52	10.8
	9/07/2019	14:17	7.6	3.653	18.1	11.44	10.8
	9/07/2019	14:18	7.6	5.661	18.7	11.91	12.3
	9/07/2019	14:19	7.6	5.688	18.6	11.83	7.8
	9/23/2019	11:35	8.5	2.221	15.1	9.07	7.32

Station ID	Date (D/M/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-01	9/23/2019	11:35	8.5	2.24	15.2	9.15	8.86
	9/23/2019	11:37	8.5	4.421	15.3	9.23	8.83
	9/23/2019	11:37	8.5	4.278	15.3	9.23	7.6
	9/23/2019	11:40	8.5	6.374	15.3	9.23	8.2
	9/23/2019	11:41	8.5	6.149	15.1	9.07	8.29
K-SMP-02L	6/22/2019	14:59	12.9	2.08	17.8	11.20	9.86
	6/22/2019	15:01	12.9	2.06	17.5	10.97	9.86
	6/22/2019	15:02	12.9	6.63	17.7	11.12	8.18
	6/22/2019	15:03	12.9	6.42	17.8	11.20	10.1
	6/22/2019	15:05	12.9	10.66	17.9	11.28	9.19
	6/22/2019	15:05	12.9	10.71	18.1	11.44	10.2
	7/07/2019	16:41	13	2.3	19.8	12.78	9.4
	7/07/2019	16:43	13	2.4	20	12.94	12.8
	7/07/2019	16:44	13	6.4	21.6	14.20	11.1
	7/07/2019	16:45	13	6.4	21	13.73	11.2
	7/07/2019	16:45	13	10.9	20.7	13.49	12.9
	7/07/2019	16:46	13	10.7	20.8	13.57	11.1
	7/24/2019	11:01	13.5	1.9	23.3	15.55	14.1
	7/24/2019	11:03	13.5	1.9	23.4	15.63	14.4
	7/24/2019	11:04	13.5	11.5	23.1	15.39	11.6
	7/24/2019	11:05	13.5	11.2	22.9	15.23	10.8
	7/24/2019	11:06	13.5	6.7	22.7	15.07	11.5
	7/24/2019	11:07	13.5	6.6	22.8	15.15	14.3
	8/13/2019	15:39	12.6	1.975	24.8	16.73	16.5
	8/13/2019	15:41	12.6	1.995	24.9	16.81	16.3
	8/13/2019	15:42	12.6	6.268	24.7	16.65	15.4
	8/13/2019	15:43	12.6	6.534	24.4	16.42	11
	8/13/2019	15:44	12.6	10.521	24.5	16.50	11.8
	8/13/2019	15:44	12.6	10.42	24.5	16.50	11.9
	8/24/2019	11:49	13.3	1.88	19.7	12.70	9.27
	8/24/2019	11:50	13.3	2.423	19.5	12.55	8.2
	8/24/2019	11:50	13.3	6.646	19.7	12.70	13.9
	8/24/2019	11:52	13.3	6.783	19.4	12.47	11
	8/24/2019	11:52	13.3	11.272	19.5	12.55	9.87
	8/24/2019	11:53	13.3	11.489	19.8	12.78	10.5
	9/07/2019	11:49	12.7	1.937	18.6	11.83	8.13
	9/07/2019	11:49	12.7	1.94	18.6	11.83	9.36
	9/07/2019	11:52	12.7	6.369	18.5	11.76	10.3
	9/07/2019	11:53	12.7	6.45	18.5	11.76	8.91
	9/07/2019	11:54	12.7	10.612	19	12.15	8.1

Station ID	Date (D/M/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-02L	9/07/2019	11:55	12.7	10.413	19	12.15	9.97
	9/29/2019	14:26	11.2	2.063	17.4	10.89	8.4
	9/29/2019	14:27	11.2	2.067	17.9	11.28	12.4
	9/29/2019	14:28	11.2	5.485	18.3	11.60	9.89
	9/29/2019	14:28	11.2	5.502	18.4	11.68	9.26
	9/29/2019	14:30	11.2	9.18	17.9	11.28	9.78
	9/29/2019	14:30	11.2	9.188	17.9	11.28	9.86
K-SMP-02R	6/22/2019	14:32	14.7	2.02	17.7	11.12	8.56
	6/22/2019	14:33	14.7	1.97	17.7	11.12	9.27
	6/22/2019	14:34	14.7	7.17	17.6	11.04	9.59
	6/22/2019	14:35	14.7	7.18	17.6	11.04	8.55
	6/22/2019	14:36	14.7	12.90	17.4	10.89	9.2
	6/22/2019	14:37	14.7	12.90	17.2	10.73	9.06
	7/07/2019	16:28	14.4	1.9	20.2	13.10	10.3
	7/07/2019	16:29	14.4	2.1	20.3	13.18	11
	7/07/2019	16:29	14.4	7.1	21.4	14.05	10.5
	7/07/2019	16:30	14.4	7.2	20.6	13.41	12.6
	7/07/2019	16:31	14.4	12.5	21.9	14.44	12.9
	7/07/2019	16:32	14.4	12.5	20.6	13.41	13.5
	7/24/2019	10:20	14.6	2.2	20.4	13.26	14.3
	7/24/2019	10:23	14.6	2.2	23.3	15.55	14.3
	7/24/2019	10:24	14.6	7.3	23.1	15.39	10.6
	7/24/2019	10:25	14.6	7.2	23.3	15.55	14
	7/24/2019	10:26	14.6	12.7	23.9	16.02	10.4
	7/24/2019	10:26	14.6	12.7	23.6	15.78	14.9
	8/13/2019	15:23	14	2.103	24.9	16.81	14.5
	8/13/2019	15:25	14	2.052	25	16.89	9.8
	8/13/2019	15:25	14	7.139	24.9	16.81	13.5
	8/13/2019	15:28	14	7.16	24.7	16.65	11.1
	8/13/2019	15:28	14	12.116	24.8	16.73	12.7
	8/13/2019	15:30	14	12.046	25.1	16.97	11.5
	8/24/2019	11:16	14.7	2.114	19.3	12.39	9.73
	8/24/2019	11:17	14.7	2.101	19.3	12.39	10.9
	8/24/2019	11:17	14.7	7.309	19.1	12.23	9.48
	8/24/2019	11:19	14.7	7.26	19.3	12.39	12.7
	8/24/2019	11:19	14.7	12.679	19.8	12.78	12.7
	8/24/2019	11:21	14.7	12.23	19.5	12.55	9.84
	9/07/2019	12:21	14	2.1	18.5	11.76	10.8
	9/07/2019	12:21	14	2.108	18.7	11.91	9.52
	9/07/2019	12:23	14	7.01	18.6	11.83	9.78

Station ID	Date (D/M/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-02R	9/07/2019	12:24	14	7.061	18.6	11.83	9.06
	9/07/2019	12:25	14	12.034	18.4	11.68	10
	9/07/2019	12:26	14	12.12	19.3	12.39	9.88
	9/29/2019	13:43	12.5	2.065	17.3	10.81	13.5
	9/29/2019	13:43	12.5	2.092	17.3	10.81	11.9
	9/29/2019	13:45	12.5	10.497	18.6	11.83	12.9
	9/29/2019	13:45	12.5	10.468	17.4	10.89	13
	9/29/2019	13:47	12.5	6.179	17.5	10.97	12.3
	9/29/2019	13:48	12.5	6.131	17.3	10.81	8.04
K-SMP-03L	6/22/2019	13:11	19.8	1.83	16.8	10.41	7.54
	6/22/2019	13:12	19.8	1.79	16.6	10.25	7.59
	6/22/2019	13:13	19.8	9.75	17	10.57	7.48
	6/22/2019	13:14	19.8	9.77	17.3	10.81	8.72
	6/22/2019	13:14	19.8	17.73	17.2	10.73	9.4
	6/22/2019	13:16	19.8	17.66	18.2	11.52	8.4
	7/07/2019	15:05	19.4	2.1	18.1	11.44	11
	7/07/2019	15:09	19.4	2.2	18.9	12.07	10
	7/07/2019	15:11	19.4	9.7	21	13.73	9.38
	7/07/2019	15:12	19.4	9.7	19.4	12.47	9.19
	7/07/2019	15:13	19.4	17.5	20.9	13.65	8.72
	7/07/2019	15:14	19.4	17.5	21.2	13.89	9.9
	7/24/2019	9:07	13	2.0	22	14.52	10.5
	7/24/2019	9:10	13	1.9	22.4	14.84	14.7
	7/24/2019	9:11	19	9.6	23.3	15.55	11.3
	7/24/2019	9:12	19	9.2	22.8	15.15	11.4
	7/24/2019	9:13	19	16.9	23.2	15.47	10.9
	7/24/2019	9:14	19	17.0	23.1	15.39	14.5
	8/13/2019	14:03	18.5	2.04	19.6	12.62	8.26
	8/13/2019	14:07	18.5	2.003	20.4	13.26	7.86
	8/13/2019	14:08	18.5	9.328	21.5	14.13	9.38
	8/13/2019	14:09	18.5	9.277	21.4	14.05	8.7
	8/13/2019	14:10	18.5	16.521	22.7	15.07	9.9
	8/13/2019	14:11	18.5	16.501	22.7	15.07	13.9
	8/24/2019	10:48	19.8	2.182	19.1	12.23	7.85
	8/24/2019	10:49	19.8	2.034	19.2	12.31	10.9
	8/24/2019	10:50	19.8	10.009	19.5	12.55	9.85
	8/24/2019	10:51	19.8	10.107	19.9	12.86	10.1
	8/24/2019	10:52	19.8	17.636	19.9	12.86	12.2
	8/24/2019	10:53	19.8	17.647	20.1	13.02	9.3
	9/07/2019	10:14	18.6	2.056	18.7	11.91	9.49

Station ID	Date (D/M/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-03L	9/07/2019	10:16	18.6	2.117	18.8	11.99	10.3
	9/07/2019	10:18	18.6	9.368	18.7	11.91	7.54
	9/07/2019	10:18	18.6	9.398	19	12.15	9.14
	9/07/2019	10:20	18.6	16.488	18.9	12.07	8.92
	9/07/2019	10:21	18.6	16.469	19.1	12.23	11.2
	9/29/2019	9:29	17.2	2.099	18.6	11.83	11
	9/29/2019	9:29	17.2	2.096	18.1	11.44	12
	9/29/2019	9:31	17.2	8.502	18.9	12.07	14.5
	9/29/2019	9:31	17.2	8.51	19.5	12.55	11.1
	9/29/2019	9:33	17.2	15.081	19.5	12.55	12.7
	9/29/2019	9:33	17.2	15.083	19.1	12.23	10.3
K-SMP-03R	6/22/2019	13:50	12.4	2.00	17.6	11.04	9.43
	6/22/2019	13:51	12.4	1.96	17.9	11.28	8.05
	6/22/2019	13:52	12.4	6.27	17.9	11.28	7.84
	6/22/2019	13:53	12.4	5.93	17.9	11.28	8.8
	6/22/2019	13:54	12.4	10.53	17.7	11.12	8.71
	6/22/2019	13:55	12.4	10.40	18.1	11.44	9.39
	7/07/2019	15:27	9.2	2.1	18.3	11.60	9.52
	7/07/2019	15:28	9.2	2.2	18.5	11.76	7.67
	7/07/2019	15:29	9.2	4.5	17.5	10.97	6.55
	7/07/2019	15:30	9.2	4.4	17.2	10.73	7.2
	7/07/2019	15:31	9.2	7.4	17.5	10.97	6.48
	7/07/2019	15:32	9.2	6.9	17.6	11.04	6.23
	7/24/2019	10:00	12	1.9	20.7	13.49	11.4
	7/24/2019	10:01	12	2.2	21.1	13.81	9.4
	7/24/2019	10:02	12	6.1	20.9	13.65	8.98
	7/24/2019	10:03	12	5.9	21.6	14.20	11.6
	7/24/2019	10:04	12	10.0	21.9	14.44	11.1
	7/24/2019	10:05	12	9.5	22	14.52	11
	8/13/2019	14:29	11	2.27	20.9	13.65	10.6
	8/13/2019	14:32	11	2.267	21.3	13.97	8.82
	8/13/2019	14:33	11	5.456	21.7	14.28	11.1
	8/13/2019	14:34	11	5.452	21.6	14.20	10.3
	8/13/2019	14:34	11	8.956	22.7	15.07	10.2
	8/13/2019	14:36	11	8.948	21.7	14.28	9.55
	8/24/2019	10:02	11.1	2.08	17.8	11.20	7.94
	8/24/2019	10:08	11.1	1.922	18	11.36	9.27
	8/24/2019	10:09	11.1	9.155	19.2	12.31	10.3
	8/24/2019	10:10	11.1	9.155	19	12.15	8.47
	8/24/2019	10:11	11.1	5.305	19.3	12.39	8.16

Station ID	Date (D/M/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-03R	8/24/2019	10:12	11.1	5.224	19	12.15	12.4
	9/07/2019	11:06	9.1	2.073	17.5	10.97	8.49
	9/07/2019	11:07	9.1	2.139	17.6	11.04	7.53
	9/07/2019	11:08	9.1	4.576	17.6	11.04	7.2
	9/07/2019	11:08	9.1	4.634	17.6	11.04	8.06
	9/07/2019	11:09	9.1	7.167	18.2	11.52	10.5
	9/07/2019	11:10	9.1	7.246	17.8	11.20	6.46
	9/29/2019	11:03	7.7	1.899	18.4	11.68	10.5
	9/29/2019	11:05	7.7	1.955	18.6	11.83	9.47
	9/29/2019	11:06	7.7	3.82	19.3	12.39	10.1
	9/29/2019	11:07	7.7	3.823	19.2	12.31	9.12
	9/29/2019	11:09	7.7	5.684	18.7	11.91	13.8
	9/29/2019	11:09	7.7	5.672	18.5	11.76	13.5

*Turbidity/TSS Relationship where TSS = [0.79 x Turbidity] – 2.86

Table 2: Manual sampling water quality monitoring data for a monitoring transect near SMP-2

Site	UTM (15U)	Site Depth (m)	Sensor Depth (m)	Time (CST)	Water Temp (°C)	Turbidity (NTU)	Calculated TSS* (mg/L)	Dissolved Oxygen (mg/L)
1	366145 6246883	3.5	1.467	10:20	15.09	15.8	9.62	9.17
			2.131	10:22	15.02	16.1	9.86	9.89
2	366118 6246957	5.5	3.589	10:32	14.98	16.7	10.33	10.29
			2.7	10:33	14.98	17.2	10.73	10.29
			1.803	10:34	14.99	16.9	10.49	10.29
3	366104 6247011	4.6	2.533	10:35	14.97	17	10.57	10.28
			2.293	10:40	14.97	17.1	10.65	10.29
			1.827	10:40	14.97	17	10.57	10.29
4	366086 6247050	6.7	4.675	10:41	14.96	16.9	10.49	10.29
			3.257	10:44	14.96	17	10.57	10.29
			1.932	10:45	14.95	17.1	10.65	10.29
5	366073 6247100	7.8	5.924	10:47	14.95	17	10.57	10.3
			3.932	10:49	14.95	16.9	10.49	10.28
			1.778	10:50	14.96	17.1	10.65	10.31
6	366055 6247150	8.7	6.873	10:51	14.93	17	10.57	10.29
			4.348	10:54	14.94	16.8	10.41	10.29
			1.904	10:54	14.94	17.6	11.04	10.32
7	366036 6247192	11.4	9.716	10:56	14.93	16.9	10.49	10.29
			5.887	11:01	14.93	16.9	10.49	10.27
			2.172	11:01	14.93	17	10.57	10.31
8	366028 6247230	12.4	11.401	11:09	14.93	17	10.57	10.29
			6.133	11:14	14.93	17.1	10.65	10.3
			2.181	11:14	14.95	16.9	10.49	10.33
9	366008 6247295	12.8	10.8	11:18	14.94	17.2	10.73	10.32
			6.68	11:21	14.94	17.1	10.65	10.3
			2.321	11:21	14.94	17	10.57	10.33
10	365997 6247342	12.6	10.815	11:22	14.94	16.9	10.49	10.31
			6.816	11:25	14.95	17.1	10.65	10.32
			1.91	11:26	14.95	17.1	10.65	10.33
11	365984 6247390	12.2	10.239	11:26	14.96	17.5	10.97	10.28
			6.321	11:30	14.97	17.5	10.97	10.33
			2.147	11:30	14.98	17	10.57	10.34
12	365969 6247439	11.8	8.971	11:31	14.98	17.2	10.73	10.31
			5.61	11:34	14.98	17.7	11.12	10.32
			1.938	11:34	14.98	17.3	10.81	10.33
13	365950 6247475	12.1	10.132	11:35	15	17.2	10.73	10.32
			5.997	11:40	15	16.9	10.49	10.31

Site	UTM (15U)	Site Depth (m)	Sensor Depth (m)	Time (CST)	Water Temp (°C)	Turbidity (NTU)	Calculated TSS* (mg/L)	Dissolved Oxygen (mg/L)
			2.186	11:40	15	17	10.57	10.33
14	365935 6247519	13.4	11.344	11:40	15.02	17.6	11.04	10.3
			6.473	11:44	15.02	17.1	10.65	10.31
			2.302	11:44	15.03	17.1	10.65	10.32
15	365915 6247574	13.6	12.074	11:45	14.99	16.9	10.49	10.4
			6.507	11:48	14.95	16.9	10.49	10.3
			2.284	11:49	14.95	17.3	10.81	10.33
16	365906 6247617	12.5	10.275	11:50	14.94	16.9	10.49	10.47
			6.11	11:53	14.92	17.5	10.97	10.33
			2.32	11:54	14.93	17.3	10.81	10.34
17	365885 6247661	13.3	11.501	11:55	14.96	17.2	10.73	10.33
			6.733	11:56	14.88	17	10.57	10.32
			2.119	11:57	14.94	17	10.57	10.33
18	365867 6247717	12.5	10.77	11:58	14.78	16.8	10.41	10.31
			6.366	12:00	14.84	16.9	10.49	10.33
			1.793	12:00	14.89	16.9	10.49	10.35
20	365852 6247766	11.3	9.062	12:00	14.75	16.4	10.10	10.67
			5.485	12:03	14.86	18.1	11.44	10.38
			2.134	12:04	14.94	17.4	10.89	10.38
21	365837 6247813	12.2	10.115	12:04	14.73	17.1	10.65	10.38
			5.976	12:06	14.73	17	10.57	10.35
			2.221	12:06	14.81	16.7	10.33	10.35

*Turbidity/TSS Relationship where TSS = [0.79 x Turbidity] – 2.86

Table 3: Manual sampling water quality monitoring data for the 2019/2020 winter season

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-01	01/13/20	16:00	6.5	4.5	10.7	5.6	5.4
K-SMP-01	01/13/20	16:00	6.5	2.0	11.9	6.5	3.6
K-SMP-01	01/13/20	16:00	6.5	3.4	11.2	6.0	4.8
K-SMP-01	01/13/20	16:00	6.5	2.0	11.9	6.5	4.3
K-SMP-01	01/13/20	16:00	6.5	4.5	10.7	5.6	3.5
K-SMP-01	01/13/20	16:00	6.5	3.4	11.2	6.0	3.6
K-SMP-01	01/26/20	12:00	6.0	3.0	9.9	5.0	4.3
K-SMP-01	01/26/20	13:30	6.0	2.0	9.9	5.0	3.8
K-SMP-01	01/26/20	13:30	6.0	2.0	9.9	5.0	4.6
K-SMP-01	01/26/20	13:30	6.0	4.0	9.9	5.0	5.7
K-SMP-01	01/26/20	13:30	6.0	3.0	9.9	5.0	3.2
K-SMP-01	01/26/20	13:30	6.0	4.0	9.9	5.0	4.1
K-SMP-01	02/15/20	16:00	6.0	4.0	9.4	4.6	5.5
K-SMP-01	02/15/20	16:00	6.0	4.0	9.5	4.6	5.6
K-SMP-01	02/15/20	16:00	6.0	2.0	8.7	4.0	4.8
K-SMP-01	02/15/20	16:00	6.0	4.0	9.4	4.6	4.4
K-SMP-01	02/15/20	16:00	6.0	2.0	8.7	4.0	4.1
K-SMP-01	02/15/20	16:00	6.0	4.0	9.5	4.6	4.2
K-SMP-01	03/03/20	14:30	6.0	2.0	9.3	4.5	4.1
K-SMP-01	03/03/20	14:30	6.0	4.0	9.3	4.5	4.7
K-SMP-01	03/03/20	14:30	6.0	3.0	9.5	4.6	5.1
K-SMP-01	03/03/20	14:30	6.0	2.0	9.3	4.5	5.5
K-SMP-01	03/03/20	14:30	6.0	4.0	9.3	4.5	4.3
K-SMP-01	03/03/20	14:30	6.0	3.0	9.5	4.6	4.7
K-SMP-01	03/30/20	14:00	6.0	4.0	7.6	3.1	6.8
K-SMP-01	03/31/20	14:00	6.0	3.0	7.6	3.1	5.1
K-SMP-01	03/31/20	14:00	6.0	2.0	7.6	3.1	4.6
K-SMP-01	04/15/20	12:00	6.0	3.0	6.4	2.2	< 2
K-SMP-01	04/15/20	12:00	6.0	3.0	6.4	2.2	4.2
K-SMP-01	04/15/20	15:00	6.0	2.0	6.2	2.0	3.7
K-SMP-01	04/15/20	15:00	6.0	4.0	6.5	2.3	3.3
K-SMP-01	04/15/20	15:00	6.0	2.0	6.2	2.0	
K-SMP-01	01/16/20	14:15	6.3	2.0	11.6	6.3	6.4
K-SMP-01	01/16/20	14:15	6.3	2.0	11.6	6.3	7.6
K-SMP-01	01/16/20	14:15	6.3	2.0	11.6	6.3	
K-SMP-01	01/16/20	14:15	6.3	2.0	11.6	6.3	
K-SMP-01	01/16/20	14:55	6.3	1.2	11.5	6.2	

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-01	01/16/20	14:55	6.3	1.2	11.5	6.2	5.6
K-SMP-01	01/16/20	14:55	6.3	1.2	11.5	6.2	5.3
K-SMP-01	01/16/20	14:59	6.3	2.1	12.0	6.6	
K-SMP-01	01/16/20	15:00	6.3	5.0	12.9	7.3	6.8
K-SMP-01	01/16/20	15:00	6.3	5.0	12.9	7.3	5.0
K-SMP-01	01/16/20	15:00	6.3	5.0	12.9	7.3	
K-SMP-01	01/16/20	15:00	6.3	5.0	12.9	7.3	
K-SMP-01	01/16/20	15:00	6.3	4.3	13.6	7.8	
K-SMP-01	01/16/20	15:01	6.3	5.1	11.7	6.4	
K-SMP-01	01/16/20	15:03	6.3	3.2	11.7	6.4	
K-SMP-01	01/16/20	15:04	6.3	0.9	12.7	7.1	
K-SMP-01	01/16/20	15:55	6.3	1.2	11.5	6.2	
K-SMP-01	02/10/20	12:58	6.3	1.3	11.8	6.4	
K-SMP-01	02/10/20	12:58	6.3	1.3	1.8	-1.5	
K-SMP-01	02/10/20	12:58	6.3	1.3	11.8	6.4	5.3
K-SMP-01	02/10/20	12:58	6.3	1.3	11.8	6.4	4.6
K-SMP-01	02/10/20	12:58	6.3	1.1	10.3	5.3	
K-SMP-01	02/10/20	13:04	6.3	2.0	13.6	7.9	
K-SMP-01	02/10/20	13:06	6.3	2.0	10.9	5.8	4.9
K-SMP-01	02/10/20	13:06	6.3	2.0	10.9	5.8	4.9
K-SMP-01	02/10/20	13:06	6.3	2.0	10.9	5.8	
K-SMP-01	02/10/20	13:06	6.3	2.0	10.9	5.8	
K-SMP-01	02/10/20	13:10	6.3	3.0	11.0	5.9	
K-SMP-01	02/10/20	13:12	6.3	4.0	10.9	5.8	
K-SMP-01	02/10/20	13:13	6.3	5.0	9.9	5.0	5.6
K-SMP-01	02/10/20	13:13	6.3	4.8	9.9	5.0	4.9
K-SMP-01	02/10/20	13:13	6.3	5.0	9.9	5.0	
K-SMP-01	02/10/20	13:13	6.3	5.0	9.9	5.0	
K-SMP-01	02/10/20	13:17	6.3	5.1	10.8	5.7	
K-SMP-01	03/16/20	13:34	6.3	1.0	9.5	4.7	
K-SMP-01	03/16/20	13:50	6.3	1.3	9.2	4.4	
K-SMP-01	03/16/20	13:50	6.3	1.3	9.2	4.4	
K-SMP-01	03/16/20	13:50	6.3	1.3	9.2	4.4	4.7
K-SMP-01	03/16/20	13:50	6.3	1.3	9.2	4.4	4.9
K-SMP-01	03/16/20	13:56	6.3	2.0	9.2	4.4	4.9
K-SMP-01	03/16/20	13:56	6.3	2.0	9.2	4.4	4.9
K-SMP-01	03/16/20	13:56	6.3	2.0	9.2	4.4	
K-SMP-01	03/16/20	13:56	6.3	2.0	9.2	4.4	
K-SMP-01	03/16/20	13:56	6.3	2.0	9.2	4.4	
K-SMP-01	03/16/20	14:01	6.3	3.0	9.2	4.4	

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-01	03/16/20	14:01	6.3	4.1	9.4	4.6	
K-SMP-01	03/16/20	14:02	6.3	5.0	9.6	4.8	
K-SMP-01	03/16/20	14:17	6.3	5.0	9.6	4.7	
K-SMP-01	03/16/20	14:17	6.3	5.0	9.6	4.7	
K-SMP-01	03/16/20	14:17	6.3	5.0	9.6	4.7	6.4
K-SMP-01	03/16/20	14:17	6.3	5.0	9.6	4.7	6.5
K-SMP-02	01/18/20	15:30	11.0	5.0	10.7	5.6	4.5
K-SMP-02	01/18/20	15:30	11.0	7.6	11.2	6.0	4.5
K-SMP-02	01/18/20	15:30	11.0	7.6	11.2	6.0	4.6
K-SMP-02	01/18/20	15:30	11.0	2.0	11.7	6.4	4.8
K-SMP-02	01/18/20	15:30	11.0	2.0	11.7	6.4	4.2
K-SMP-02	01/18/20	15:30	11.0	5.0	10.7	5.6	4.3
K-SMP-02	01/20/20	13:43	8.9	8.0	13.0	7.4	
K-SMP-02	01/20/20	13:45	8.9	7.1	12.1	6.7	
K-SMP-02	01/20/20	13:45	8.9	7.1	12.1	6.7	
K-SMP-02	01/20/20	13:45	8.9	7.1	12.1	6.7	14.6
K-SMP-02	01/20/20	13:45	8.9	7.1	12.1	6.7	12.7
K-SMP-02	01/20/20	13:56	8.9	7.0	13.4	7.7	
K-SMP-02	01/20/20	13:56	8.9	6.1	12.8	7.2	
K-SMP-02	01/20/20	13:57	8.9	5.1	12.8	7.3	
K-SMP-02	01/20/20	13:57	8.9	4.1	12.5	7.0	
K-SMP-02	01/20/20	13:57	8.9	3.0	12.4	6.9	
K-SMP-02	01/20/20	14:02	8.9	2.0	11.3	6.1	
K-SMP-02	01/20/20	14:03	8.9	2.0	11.1	5.9	
K-SMP-02	01/20/20	14:06	8.9	2.0	11.3	6.1	
K-SMP-02	01/20/20	14:06	8.9	2.0	11.3	6.1	5.1
K-SMP-02	01/20/20	14:06	8.9	2.0	11.3	6.1	5.0
K-SMP-02	01/20/20	14:55	8.9	1.4	12.8	7.2	
K-SMP-02	01/26/20	10:00	11.0	2.0	9.2	4.4	3.6
K-SMP-02	01/26/20	10:00	11.0	5.5	10.2	5.2	3.7
K-SMP-02	01/26/20	10:00	11.0	9.0	9.9	5.0	4.2
K-SMP-02	01/26/20	10:00	11.0	9.0	9.9	5.0	4.1
K-SMP-02	01/26/20	10:00	11.0	5.5	10.2	5.2	4.9
K-SMP-02	01/26/20	10:00	11.0	2.0	9.2	4.4	3.9
K-SMP-02	02/10/20	14:06	8.9	1.0	9.4	4.6	
K-SMP-02	02/10/20	14:07	8.9	2.0	10.8	5.7	
K-SMP-02	02/10/20	14:12	8.9	2.0	11.4	6.1	3.8
K-SMP-02	02/10/20	14:12	8.9	2.0	11.4	6.1	4.6
K-SMP-02	02/10/20	14:12	8.9	2.0	11.4	6.1	
K-SMP-02	02/10/20	14:12	8.9	2.0	11.4	6.1	

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-02	02/10/20	14:14	8.9	3.0	12.5	7.0	
K-SMP-02	02/10/20	14:15	8.9	4.0	11.3	6.1	
K-SMP-02	02/10/20	14:15	8.9	5.0	11.5	6.2	
K-SMP-02	02/10/20	14:16	8.9	7.0	9.4	4.6	
K-SMP-02	02/10/20	14:16	8.9	7.0	9.4	4.6	
K-SMP-02	02/10/20	14:16	8.9	7.0	9.4	4.6	5.1
K-SMP-02	02/10/20	14:16	8.9	7.0	9.4	4.6	4.7
K-SMP-02	02/10/20	14:16	8.9	6.0	10.0	5.0	
K-SMP-02	02/10/20	14:16	8.9	7.0	10.0	5.0	
K-SMP-02	02/10/20	14:23	8.9	8.0	10.6	5.5	
K-SMP-02	02/15/20	11:30	10.0	8.0	9.4	4.6	5.0
K-SMP-02	02/15/20	11:30	11.0	2.0	8.8	4.1	5.5
K-SMP-02	02/15/20	11:30	11.0	2.0	8.8	4.1	6.6
K-SMP-02	02/15/20	11:30	11.0	5.0	9.3	4.5	5.9
K-SMP-02	02/15/20	11:30	11.0	5.0	9.3	4.5	6.0
K-SMP-02	02/15/20	11:30	10.0	8.0	9.4	4.6	6.3
K-SMP-02	03/02/20	11:00	10.0	10.0	8.3	3.7	4.4
K-SMP-02	03/02/20	11:00	10.0	8.0	8.3	3.7	4.6
K-SMP-02	03/02/20	11:00	10.0	2.0	8.0	3.5	4.9
K-SMP-02	03/02/20	11:00	10.0	5.0	8.2	3.6	5.4
K-SMP-02	03/02/20	11:00	10.0	2.0	8.0	3.5	5.2
K-SMP-02	03/02/20	11:00	10.0	5.0	8.2	3.6	4.2
K-SMP-02	03/13/20	11:00	9.4	7.4	8.6	3.9	5.4
K-SMP-02	03/13/20	11:00	9.4	2.0	8.8	4.1	4.8
K-SMP-02	03/13/20	11:00	9.4	4.7	8.2	3.6	5.0
K-SMP-02	03/13/20	11:00	9.4	4.7	8.2	3.6	5.1
K-SMP-02	03/13/20	11:00	9.4	2.0	8.8	4.1	4.9
K-SMP-02	03/13/20	11:00	9.4	7.4	8.6	3.9	6.6
K-SMP-02	03/16/20	15:20	8.9	1.0	9.6	4.7	
K-SMP-02	03/16/20	15:22	8.9	2.0	9.9	4.9	6.5
K-SMP-02	03/16/20	15:22	8.9	2.0	9.9	4.9	6.3
K-SMP-02	03/16/20	15:22	8.9	2.0	9.9	4.9	
K-SMP-02	03/16/20	15:22	8.9	2.0	9.9	4.9	
K-SMP-02	03/16/20	15:22	8.9	2.1	10.1	5.1	
K-SMP-02	03/16/20	15:37	8.9	3.0	9.7	4.8	
K-SMP-02	03/16/20	15:39	8.9	4.0	10.1	5.1	
K-SMP-02	03/16/20	15:40	8.9	5.0	11.1	5.9	
K-SMP-02	03/16/20	15:40	8.9	6.0	9.4	4.6	
K-SMP-02	03/16/20	15:41	8.9	7.0	9.9	4.9	
K-SMP-02	03/16/20	15:42	8.9	7.1	10.8	5.7	6.6

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-02	03/16/20	15:42	8.9	7.1	10.8	5.7	6.2
K-SMP-02	03/16/20	15:42	8.9	7.1	10.8	5.7	
K-SMP-02	03/16/20	15:42	8.9	7.1	10.8	5.7	
K-SMP-02	03/16/20	15:57	8.9	8.0	9.9	4.9	
K-SMP-02	03/31/20	13:00	9.4	7.4	8.1	3.5	4.9
K-SMP-02	03/31/20	13:00	9.4	2.0	7.8	3.3	3.6
K-SMP-02	03/31/20	13:00	9.4	4.7	7.8	3.3	5.0
K-SMP-02	04/15/20	10:00	9.4	2.0	6.2	2.0	
K-SMP-02	04/15/20	10:00	9.4	2.0	6.2	2.0	3.1
K-SMP-02	04/15/20	10:00	9.4	7.4	6.8	2.5	3.5
K-SMP-02	04/15/20	10:00	9.4	4.7	6.8	2.5	3.6
K-SMP-02	04/15/20	10:00	9.4	4.7	6.8	2.5	3.8
K-SMP-03L	01/12/20	14:00	12.0	18.0	13.5	7.8	7.7
K-SMP-03L	01/12/20	14:00	12.0	18.0	13.5	7.8	8.0
K-SMP-03L	01/12/20	14:00	12.0	2.0	12.6	7.1	6.0
K-SMP-03L	01/12/20	14:00	12.0	10.0	12.8	7.3	6.2
K-SMP-03L	01/12/20	14:00	12.0	2.0	12.6	7.1	6.8
K-SMP-03L	01/12/20	14:00	12.0	10.0	12.8	7.3	6.1
K-SMP-03L	01/21/20	11:35	18.3	18.0	13.2	7.6	
K-SMP-03L	01/21/20	11:36	18.3	17.0	14.5	8.6	
K-SMP-03L	01/21/20	11:36	18.3	16.0	15.7	9.5	
K-SMP-03L	01/21/20	11:37	18.3	15.0	26.2	17.8	
K-SMP-03L	01/21/20	11:50	18.3	14.6	14.9	8.9	7.6
K-SMP-03L	01/21/20	11:50	18.3	14.6	14.9	8.9	
K-SMP-03L	01/21/20	11:54	18.3	14.0	13.9	8.1	
K-SMP-03L	01/21/20	11:55	18.3	12.0	16.7	10.3	
K-SMP-03L	01/21/20	11:55	18.3	11.0	15.0	9.0	
K-SMP-03L	01/21/20	11:57	18.3	10.0	11.5	6.2	
K-SMP-03L	01/21/20	11:57	18.3	9.0			
K-SMP-03L	01/21/20	11:58	18.3	8.0	11.5	6.2	
K-SMP-03L	01/21/20	11:58	18.3	7.0	11.2	6.0	
K-SMP-03L	01/21/20	11:59	18.3	6.0	10.3	5.3	
K-SMP-03L	01/21/20	11:59	18.3	5.0	11.6	6.3	
K-SMP-03L	01/21/20	11:59	18.3	4.0	11.6	6.3	
K-SMP-03L	01/21/20	12:00	18.3	14.0	13.7	8.0	
K-SMP-03L	01/21/20	12:00	18.3	3.6	11.4	6.2	6.5
K-SMP-03L	01/21/20	12:00	18.3	14.6	14.9	8.9	6.0
K-SMP-03L	01/21/20	12:00	18.3	14.6	14.9	8.9	
K-SMP-03L	01/21/20	12:06	18.3	3.0	11.9	6.6	
K-SMP-03L	01/21/20	12:06	18.3	2.0	11.3	6.1	

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-03L	01/21/20	12:10	18.3	3.6	11.4	6.2	
K-SMP-03L	01/21/20	12:10	18.3	2.0	11.9	6.5	
K-SMP-03L	01/21/20	12:10	18.3	3.6	11.4	6.1	6.3
K-SMP-03L	01/21/20	12:10	18.3	2.0	11.9	6.5	4.9
K-SMP-03L	01/21/20	12:10	18.3	2.0	11.9	6.5	5.8
K-SMP-03L	01/21/20	12:10	18.3	2.0	11.9	6.5	
K-SMP-03L	01/21/20	12:10	18.3	3.6	11.4	6.2	
K-SMP-03L	01/21/20	12:11	18.3	1.0	11.7	6.4	
K-SMP-03L	01/26/20	12:00	20.0	2.0	10.1	5.1	3.9
K-SMP-03L	01/26/20	12:30	20.0	10.0	9.5	4.6	4.4
K-SMP-03L	01/26/20	12:30	20.0	10.0	10.4	5.4	5.2
K-SMP-03L	01/26/20	12:30	20.0	2.0	10.1	5.1	4.2
K-SMP-03L	01/26/20	12:30	20.0	18.0	10.4	5.4	4.7
K-SMP-03L	01/26/20	12:30	20.0	18.0	10.4	5.4	4.4
K-SMP-03L	02/13/20	14:14	18.3	10.0	9.6	4.7	
K-SMP-03L	02/13/20	14:31	18.3	18.0	10.2	5.2	
K-SMP-03L	02/13/20	14:32	18.3	17.0	11.1	5.9	
K-SMP-03L	02/13/20	14:33	18.3	16.0	11.1	5.9	
K-SMP-03L	02/13/20	14:33	18.3	15.0	10.2	5.2	
K-SMP-03L	02/13/20	14:36	18.3	14.7	9.4	4.6	
K-SMP-03L	02/13/20	14:36	18.3	14.7	9.4	4.6	4.4
K-SMP-03L	02/13/20	14:36	18.3	14.7	9.4	4.6	4.5
K-SMP-03L	02/13/20	14:36	18.3	14.7	9.4	4.6	
K-SMP-03L	02/13/20	14:42	18.3	14.0	9.5	4.7	
K-SMP-03L	02/13/20	14:42	18.3	13.0	9.6	4.7	
K-SMP-03L	02/13/20	14:43	18.3	12.1	9.0	4.2	
K-SMP-03L	02/13/20	14:44	18.3	11.0	9.8	4.9	
K-SMP-03L	02/13/20	14:45	18.3	9.0	9.4	4.5	
K-SMP-03L	02/13/20	14:46	18.3	8.0	9.9	4.9	
K-SMP-03L	02/13/20	14:47	18.3	7.0	9.3	4.5	
K-SMP-03L	02/13/20	14:47	18.3	6.0	9.3	4.5	
K-SMP-03L	02/13/20	14:48	18.3	5.0	10.1	5.1	
K-SMP-03L	02/13/20	14:49	18.3	4.0	9.4	4.6	
K-SMP-03L	02/13/20	14:51	18.3	3.6	9.5	4.7	4.3
K-SMP-03L	02/13/20	14:51	18.3	3.6	9.5	4.7	
K-SMP-03L	02/13/20	14:51	18.3	3.6	9.5	4.7	
K-SMP-03L	02/13/20	14:51	18.3	3.6	9.5	4.7	4.7
K-SMP-03L	02/13/20	14:54	18.3	3.0	9.8	4.9	
K-SMP-03L	02/13/20	14:58	18.3	2.0	9.9	5.0	
K-SMP-03L	02/13/20	14:58	18.3	2.0	9.9	5.0	

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-03L	02/13/20	14:58	18.3	2.0	9.9	5.0	4.9
K-SMP-03L	02/13/20	14:58	18.3	2.0	9.9	5.0	4.2
K-SMP-03L	02/15/20	15:00	20.0	10.0	9.3	4.5	5.4
K-SMP-03L	02/15/20	15:00	20.0	18.0	9.7	4.8	5.7
K-SMP-03L	02/15/20	15:00	20.0	2.0	9.6	4.7	6.1
K-SMP-03L	02/15/20	15:00	20.0	18.0	9.7	4.8	5.7
K-SMP-03L	02/15/20	15:00	20.0	10.0	9.3	4.5	5.4
K-SMP-03L	02/15/20	15:00	20.0	2.0	9.6	4.7	6.6
K-SMP-03L	02/28/20	14:58	18.3	2.0	9.9	5.0	
K-SMP-03L	02/28/20	15:00	18.3	1.0	11.8	6.5	
K-SMP-03L	03/02/20	12:00	20.0	2.0	8.2	3.6	4.4
K-SMP-03L	03/02/20	12:00	20.0	2.0	8.2	3.6	4.1
K-SMP-03L	03/02/20	12:00	20.0	18.0	9.1	4.3	4.5
K-SMP-03L	03/02/20	12:00	20.0	18.0	9.1	4.3	5.3
K-SMP-03L	03/02/20	12:00	20.0	10.0	8.5	3.9	4.5
K-SMP-03L	03/02/20	12:00	20.0	10.0	8.5	3.9	6.6
K-SMP-03L	03/14/20	13:00	20.4	10.2	7.6	3.1	5.5
K-SMP-03L	03/14/20	13:00	20.4	10.2	7.6	3.1	5.1
K-SMP-03L	03/14/20	13:00	20.4	18.2	8.2	3.6	5.1
K-SMP-03L	03/14/20	13:00	20.4	2.0	7.6	3.1	4.2
K-SMP-03L	03/14/20	13:00	20.4	2.0	7.6	3.1	5.1
K-SMP-03L	03/14/20	13:00	20.4	18.2	8.2	3.6	
K-SMP-03L	03/17/20	10:06	18.3	1.0	8.4	3.8	
K-SMP-03L	03/17/20	10:08	18.3	2.0	8.7	4.0	
K-SMP-03L	03/17/20	10:19	18.3	2.0	10.4	5.3	4.7
K-SMP-03L	03/17/20	10:19	18.3	2.0	10.4	5.3	4.8
K-SMP-03L	03/17/20	10:19	18.3	2.0	10.4	5.3	
K-SMP-03L	03/17/20	10:19	18.3	2.0	10.4	5.3	
K-SMP-03L	03/17/20	10:20	18.3	3.0	8.6	3.9	
K-SMP-03L	03/17/20	10:24	18.3	3.6	8.0	3.5	
K-SMP-03L	03/17/20	10:24	18.3	3.6	8.0	3.5	
K-SMP-03L	03/17/20	10:24	18.3	3.6	8.0	3.5	5.0
K-SMP-03L	03/17/20	10:24	18.3	3.6	8.0	3.5	5.2
K-SMP-03L	03/17/20	10:37	18.3	4.0	8.6	3.9	
K-SMP-03L	03/17/20	10:38	18.3	5.0	8.4	3.8	
K-SMP-03L	03/17/20	10:39	18.3	6.0	8.4	3.8	
K-SMP-03L	03/17/20	10:40	18.3	7.0	8.7	4.0	
K-SMP-03L	03/17/20	10:40	18.3	8.0	8.5	3.8	
K-SMP-03L	03/17/20	10:41	18.3	9.0	8.6	4.0	
K-SMP-03L	03/17/20	10:42	18.3	10.0	8.9	4.1	

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-03L	03/17/20	10:43	18.3	11.0	8.6	3.9	
K-SMP-03L	03/17/20	10:44	18.3	12.0	8.6	3.9	
K-SMP-03L	03/17/20	10:44	18.3	13.0	9.0	4.2	
K-SMP-03L	03/17/20	10:45	18.3	14.0	8.7	4.0	
K-SMP-03L	03/17/20	10:56	18.3	14.6	8.6	3.9	5.4
K-SMP-03L	03/17/20	10:56	18.3	14.6	8.6	3.9	5.5
K-SMP-03L	03/17/20	10:56	18.3	14.6	8.6	3.9	
K-SMP-03L	03/17/20	10:56	18.3	14.6	8.6	3.9	
K-SMP-03L	03/17/20	10:59	18.3	15.1	8.9	4.2	
K-SMP-03L	03/17/20	10:59	18.3	16.0	8.8	4.1	
K-SMP-03L	03/17/20	11:00	18.3	17.0	8.8	4.1	
K-SMP-03L	03/17/20	11:01	18.3	18.0	8.8	4.1	
K-SMP-03L	03/31/20	12:00	20.0	10.2	7.5	3.1	4.3
K-SMP-03L	03/31/20	12:00	20.0	18.2	7.5	3.1	5.0
K-SMP-03L	03/31/20	12:00	20.0	2.0	7.3	2.9	4.2
K-SMP-03L	04/15/20	12:00	20.0	7.0	6.4	2.2	3.4
K-SMP-03L	04/15/20	12:00	20.0	2.0	6.6	2.4	
K-SMP-03L	04/15/20	12:00	20.0	2.0	6.6	2.4	3.4
K-SMP-03L	04/15/20	12:00	20.0	7.0	6.4	2.2	3.1
K-SMP-03R	01/18/20	13:00	12.0	2.0	10.5	5.4	5.3
K-SMP-03R	01/18/20	13:00	12.0	10.0	11.3	6.1	6.0
K-SMP-03R	01/18/20	13:00	12.0	6.0	10.7	5.6	5.4
K-SMP-03R	01/18/20	13:00	12.0	6.0	10.7	5.6	4.0
K-SMP-03R	01/18/20	13:00	12.0	2.0	10.5	5.4	6.2
K-SMP-03R	01/18/20	13:00	12.0	10.0	11.3	6.1	
K-SMP-03R	01/21/20	10:40	10.3	8.0	12.7	7.2	
K-SMP-03R	01/21/20	10:40	10.3	8.0	12.7	7.2	
K-SMP-03R	01/21/20	10:40	10.3	8.0	12.7	7.2	7.5
K-SMP-03R	01/21/20	10:40	10.3	8.0	12.7	7.2	5.4
K-SMP-03R	01/21/20	10:45	10.3	7.0	14.5	8.6	
K-SMP-03R	01/21/20	10:46	10.3	6.1	15.7	9.6	
K-SMP-03R	01/21/20	10:46	10.3	5.0	28.5	19.6	
K-SMP-03R	01/21/20	10:46	10.3	4.0	13.7	8.0	
K-SMP-03R	01/21/20	10:47	10.3	3.0	12.4	6.9	
K-SMP-03R	01/21/20	10:48	10.3	2.0	13.1	7.4	
K-SMP-03R	01/21/20	10:48	10.3	2.0	12.6	7.1	
K-SMP-03R	01/21/20	10:50	10.3	2.0	13.1	7.4	
K-SMP-03R	01/21/20	10:50	10.3	2.0	13.1	7.4	6.7
K-SMP-03R	01/21/20	10:53	10.3	1.0	13.6	7.8	
K-SMP-03R	01/21/20	12:00	10.3	2.0	13.1	7.4	4.9

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-03R	01/26/20	11:00	11.6	9.6	12.1	6.7	5.5
K-SMP-03R	01/26/20	11:00	11.6	9.6	12.1	6.7	5.5
K-SMP-03R	01/26/20	11:00	11.6	2.0	10.9	5.8	5.2
K-SMP-03R	01/26/20	11:00	11.6	5.8	10.5	5.4	5.0
K-SMP-03R	01/26/20	11:00	11.6	5.8	10.5	5.4	5.7
K-SMP-03R	01/26/20	11:00	11.6	2.0	10.9	5.8	4.1
K-SMP-03R	02/13/20	13:22	10.3	1.0	9.8	4.8	
K-SMP-03R	02/13/20	13:23	10.3	2.0	9.4	4.6	
K-SMP-03R	02/13/20	13:23	10.3	2.0	9.4	4.6	
K-SMP-03R	02/13/20	13:23	10.3	2.0	9.4	4.6	4.3
K-SMP-03R	02/13/20	13:23	10.3	2.0	9.4	4.6	5.1
K-SMP-03R	02/13/20	13:23	10.3	2.0	9.8	4.9	
K-SMP-03R	02/13/20	13:29	10.3	3.0	10.3	5.3	
K-SMP-03R	02/13/20	13:31	10.3	3.6	9.7	4.8	
K-SMP-03R	02/13/20	13:31	10.3	3.6	9.7	4.8	4.0
K-SMP-03R	02/13/20	13:31	10.3	3.6	9.7	4.8	
K-SMP-03R	02/13/20	13:31	10.3	3.6	9.7	4.8	4.8
K-SMP-03R	02/13/20	13:35	10.3	4.0	10.1	5.1	
K-SMP-03R	02/13/20	13:36	10.3	5.0	11.4	6.1	
K-SMP-03R	02/13/20	13:37	10.3	6.0	10.4	5.4	
K-SMP-03R	02/13/20	13:38	10.3	7.0	8.9	4.1	
K-SMP-03R	02/13/20	13:39	10.3	8.0	10.4	5.3	
K-SMP-03R	02/13/20	13:39	10.3	9.0	10.3	5.3	
K-SMP-03R	02/13/20	13:41	10.3	10.0	10.6	5.5	
K-SMP-03R	02/13/20	13:45	10.3	8.0	9.9	4.9	
K-SMP-03R	02/13/20	13:45	10.3	8.0	9.9	4.9	
K-SMP-03R	02/13/20	13:45	10.3	8.0	9.9	4.9	6.3
K-SMP-03R	02/13/20	13:45	10.3	8.0	9.9	4.9	6.0
K-SMP-03R	02/15/20	14:00	11.0	5.5	9.0	4.3	5.0
K-SMP-03R	02/15/20	14:00	11.0	2.0	8.8	4.1	4.3
K-SMP-03R	02/15/20	14:00	11.0	9.0	9.3	4.5	5.5
K-SMP-03R	02/15/20	14:00	11.0	5.5	9.0	4.3	5.0
K-SMP-03R	02/15/20	14:00	11.0	9.0	9.3	4.5	4.7
K-SMP-03R	02/15/20	14:00	11.0	2.0	8.8	4.1	4.6
K-SMP-03R	03/02/20	13:00	11.0	9.1	8.3	3.7	11.6
K-SMP-03R	03/02/20	13:00	11.0	2.0	9.0	4.3	4.4
K-SMP-03R	03/02/20	13:00	11.0	5.3	8.4	3.8	4.1
K-SMP-03R	03/02/20	13:00	11.0	5.3	8.4	3.8	4.1
K-SMP-03R	03/02/20	13:00	11.0	9.1	8.3	3.7	4.4
K-SMP-03R	03/02/20	13:00	11.0	2.0	9.0	4.3	3.9

Station ID	Date (M/D/Y)	Time (CST)	Site Depth (m)	Sensor/Sample Depth (m)	Turbidity (NTU)	Calculated TSS* (mg/L)	Lab TSS (mg/L)
K-SMP-03R	03/14/20	14:00	11.0	1.0	7.9	3.4	3.9
K-SMP-03R	03/14/20	14:00	11.5	5.8	8.6	3.9	4.1
K-SMP-03R	03/14/20	14:00	11.5	9.5	8.5	3.9	4.5
K-SMP-03R	03/14/20	14:00	11.5	5.8	8.6	3.9	4.4
K-SMP-03R	03/14/20	14:00	11.0	2.0	7.9	3.4	5.4
K-SMP-03R	03/14/20	14:00	11.5	9.5	8.5	3.9	
K-SMP-03R	03/17/20	11:52	10.3	1.0	10.8	5.6	
K-SMP-03R	03/17/20	11:53	10.3	2.0	9.1	4.3	
K-SMP-03R	03/17/20	11:58	10.3	2.0	8.6	3.9	4.2
K-SMP-03R	03/17/20	11:58	10.3	2.0	8.6	3.9	4.6
K-SMP-03R	03/17/20	11:58	10.3	2.0	8.6	3.9	
K-SMP-03R	03/17/20	11:58	10.3	2.0	8.6	3.9	
K-SMP-03R	03/17/20	12:07	10.3	3.0	8.6	3.9	
K-SMP-03R	03/17/20	12:08	10.3	4.0	8.5	3.9	
K-SMP-03R	03/17/20	12:09	10.3	5.1	8.9	4.2	
K-SMP-03R	03/17/20	12:09	10.3	6.0	8.9	4.2	
K-SMP-03R	03/17/20	12:10	10.3	8.2	9.1	4.3	
K-SMP-03R	03/17/20	12:10	10.3	8.2	9.1	4.3	4.7
K-SMP-03R	03/17/20	12:10	10.3	8.2	9.1	4.3	
K-SMP-03R	03/17/20	12:10	10.3	8.2	9.1	4.3	5.2
K-SMP-03R	03/17/20	12:10	10.3	7.0	8.4	3.7	
K-SMP-03R	03/17/20	12:11	10.3	8.0	8.5	3.9	
K-SMP-03R	03/17/20	12:23	10.3	9.0	8.4	3.8	
K-SMP-03R	03/17/20	12:24	10.3	10.0	8.6	3.9	
K-SMP-03R	03/31/20	12:00	11.0	9.5	7.4	3.0	4.2
K-SMP-03R	03/31/20	12:00	11.0	5.8	7.4	3.0	4.5
K-SMP-03R	03/31/20	12:00	11.0	2.0	8.0	3.5	4.3
K-SMP-03R	04/15/20	14:00	11.0	5.7	6.5	2.3	3.5
K-SMP-03R	04/15/20	14:00	11.0	2.0	6.6	2.4	5.7
K-SMP-03R	04/15/20	14:00	11.0	2.0	6.6	2.4	3.3
K-SMP-03R	04/15/20	14:00	11.0	5.7	6.5	2.3	3.7

*Turbidity/TSS Relationship where TSS = [0.79 x Turbidity] – 2.86