

## **APPENDIX C**

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### **SEDIMENT SAMPLING ACTIVITIES - FIELD SUMMARY REPORTS AND TECHNICAL MEMORANDA**

## **APPENDIX C-1**

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FIELD REPORT

SEDIMENT SAMPLING ACTIVITIES FOR THE

ASSESSMENT OF SEDIMENT TOXICITY TO

WHITE STURGEON

JUNE 22 – 27, 2010

# **Upper Columbia River**

## **Field Report Sediment Sampling Activities for the Assessment of Sediment Toxicity to White Sturgeon June 22 - 27, 2010**

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## ACRONYMS

CCT	Colville Confederated Tribes
cfs	cubic feet per second
CB	China Bend - Sampling Location
COPC	contaminants of potential concern
DME	Deadmans Eddy – Sampling Location
ELS	early life stages (white sturgeon)
Ecology	Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
Gravity	Gravity Environmental, LLC
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	high density polyethylene
IDW	investigation derived wastes
LD	Little Dalles – Sampling Location
LMF	Lower Marcus Flats – Sampling Location
NP	Northport – Sampling Location
NPS	National Park Service, U.S. Department of the Interior
QAPP	Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon
RI/FS	remedial investigation/feasibility study
RM	river mile
RV	research vessel
SOPs	standard operating procedures
Teck	Teck American Incorporated
UCR	Upper Columbia River
UMF	Upper Marcus Flats - Sampling Location
USGS	United States Geological Survey, U.S. Department of the Interior
UTM	Universal Transverse Mercator, North American Datum 1983 (NAD 83)

# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

This document presents a summary report for field sediment sampling conducted by URS Corporation (URS) under the *Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon* (“the study”, QAPP, May 2010, Amended June 2010). This work was conducted as part of the Upper Columbia River (UCR) (the Site) Remedial Investigation and Feasibility Study (RI/FS) on behalf of Teck American Incorporated (Teck). Primary objectives of the RI/FS are to investigate the nature and extent of unacceptable risk at the Site, to provide information to support baseline risk assessments for human health (to be completed by the U.S. Environmental Protection Agency [EPA]) and the environment (to be completed by Teck); and to develop and evaluate potential remedial alternatives for the Site.

The QAPP presented the approach and rationale for conducting a study to assess the toxicity of contaminants of potential concern (COPCs) associated with granulated slag from sediments in the UCR to early life stages (ELS) of white sturgeon. Data obtained during this work will be used in the baseline ecological risk assessment and overall RI/FS. Sediment toxicity to ELS of white sturgeon will be evaluated using field collected sediments from areas hypothesized and confirmed as suitable white sturgeon habitat, and containing a range of slag-related COPC concentrations.

During the sediment field sampling program, samples were collected at four primary and two alternate sampling locations spatially distributed along the UCR, in accordance with the QAPP. The following report presents the scope of work, collection procedures and methodologies, and summary of the below-water sediment sampling program conducted.

## 1.2 SITE DESCRIPTION

The sampling program consisted of collecting below-water sediment samples from within four primary and two alternate locations as defined by the QAPP. Primary locations include: Lower Marcus Flats, Upper Marcus Flats, China Bend, and Deadmans Eddy. Alternate locations include Northport and Little Dalles.

Each of the four primary and two alternate locations includes three separate stations with center position Easting and Northing coordinates provided by the QAPP using the Universal Transverse Mercator (UTM) system using Zone 11 of the 1983 North American Datum (NAD83) data set. Each of the three stations within each location consisted of a 20-meter (66-foot) diameter sample area around the station center coordinate. General sampling locations and stations are described below and are illustrated on Map 1.

Each of the three stations within the six locations was assigned a suffix consisting of the sequential numbers 1 through 3, as defined below.

- **Lower Marcus Flats (LMF).** UMF is a primary sampling location positioned approximately at river mile (RM) 705, consisting of the following three stations:

LMF-01 - Easting 419596.598, Northing 5389522.361

LMF-02 - Easting 418470.318, Northing 5390165.566

LMF-03 - Easting 418534.187, Northing 5389414.844

- **Upper Marcus Flats (UMF).** UMF is a primary sampling location positioned approximately at RM 707 consisting of the following three stations:

UMF-01 - Easting 422651.955, Northing 5391668.047

UMF-02 - Easting 420593.484, Northing 5390655.659

UMF-03 - Easting 420027.511, Northing 5392090.602

- **China Bend (CB).** CB is a primary sampling location positioned approximately at RM 725 consisting of the following three stations:

CB-01 - Easting 431604.246, Northing 5407646.304

CB-02 - Easting 432120.704, Northing 5408773.751

CB-03 - Easting 431112.592, Northing 5407574.889

- **Deadmans Eddy (DME).** DME is a primary sampling location positioned approximately at RM 737 consisting of the following three stations:

DME-01 - Easting 446405.316, Northing 5420949.545

DME-02 - Easting 446795.613, Northing 5420448.714

DME-03 - Easting 446288.597, Northing 5420740.789

- **Northport (NP).** NP is an alternate sampling location positioned approximately at RM 735, and was selected in the event that primary sampling stations were not capable of providing competent samples. The following three alternate stations within NP include:

NP-01 - Easting 443442.450, Northing 5419135.820

NP-02 - Easting 444108.470, Northing 5419838.750

NP-03 - Easting 443302.500, Northing 5419361.440



- **Little Dalles (LD)**. LD is an alternate sampling location positioned approximately at river mile 729 and was selected in the event that primary sampling stations were not capable of providing competent samples. The following three alternate stations within LD include:

LD-01 - Easting 435417.180, Northing 5412544.520

LD-02 - Easting 436606.680, Northing 5413599.700

LD-03 - Easting 438123.570, Northing 5414445.120

Station coordinates were initially provided in the May 2010 QAPP and with the exception of four remain unchanged. Based on additional technical input, four station coordinates (CB-02, CB-03, LMF-03, and LD-3) were changed and the locations re-issued in the June 2010 QAPP Addendum. For the purposes of this effort, the four modified stations were considered “abandoned”. Map 1 illustrates the locations of the abandoned stations in reference to the new stations.

### 1.3 SAMPLING OVERVIEW

As outlined in the QAPP, 10 grab samples consisting of one 5-gallon high density polyethylene (HDPE) container each were to be collected from the 12 primary stations (three stations at each of the four primary locations). Six additional stations from within the two alternate locations (NP and LD) were selected for sampling if primary station sample conditions precluded or limited competent sample collection based on rejection criteria under QAPP Standard Operating Procedure No. 4 Below-Water Grab Sampling Procedures (SOP-4). The QAPP provided for collection of 120 containers (i.e., 5-gallon HDPE containers) from primary stations: 12 stations with 10 grab sample containers per station; or from the alternate locations to meet the sediment volume target, if necessary.

During the 2010 sediment sampling program, a total of 59 samples were collected from primary and alternate locations (Tables 1 through 6). The sampling program started on June 22, 2010 and was completed on June 27, 2010.

URS provided a field crew consisting of two geologists and one registered professional archaeologist. The field crew was responsible for completing, monitoring, and documenting the sampling process, physical descriptions of samples and conditions, and general observations.

Gravity Environmental LLC (Gravity) provided the sampling boat, the Research Vessel (RV) Palouse, from which all sampling activities were completed. In addition, Gravity provided an additional vessel (RV Monarch) under subcontract to Columbia Navigation, Inc. for safety and support of the sampling crew, and transporting technical and cultural resources observers (i.e., oversight).

## 1.4 CULTURAL RESOURCES

In accordance with the protocols outlined in Appendix E, Cultural Resources Coordination Plan, of the approved QAPP, a cultural resources monitor was present throughout the duration of the below-water sediment sampling program. Teck contracted with URS to provide a professional archaeologist meeting the Secretary of Interior's Professional Qualification Standards (as outlined in 36 CFR Part 61) to be present in the event that cultural resources were encountered during sediment removal. In addition, the National Park Service (NPS) provided cultural resources personnel when sediment sampling occurred within the jurisdiction of the Lake Roosevelt National Recreation Area.

The monitoring archaeologist(s) visually examined each sample as it was released from the Power Grab Sampler and again when the sediment was manually transferred from the Lexan tub to the 5-gallon HDPE containers. No cultural resources were identified during the sampling program. The report summarizing archaeological monitoring is presented in Appendix A of this report.

## 1.5 TECHNICAL OVERSIGHT AND OBSERVERS

During sampling, various technical observers joined the field sampling team to monitor the sampling procedures. Observers included hydrogeologists, archaeologists, and other technical personnel representing EPA and the participating parties. During all times, observers were provided the opportunity to ask questions of the URS field lead, assistant field lead, and archaeologist; and to participate in open dialogue regarding the sampling procedures relative to the QAPP. A daily attendance record is provided in Appendix B. The following is a summary list of on-boat observers:

Technical Observers List (June 22 through June 27, 2010)

<b>Observer</b>	<b>Organization</b>	<b>Representing</b>
Jon Edwards	NPS	NPS
Jim Retzer	NPS	NPS
Jonathan Riehn	NPS	NPS
Craig Christian	Environment International	Colville Confederated Tribes and Washington Department of Ecology
Marcella Ripich	CH2M Hill	EPA
Nichole Badon	CH2M Hill	EPA

A NPS archaeologist was on-board the RV Palouse at all times during sampling within the Lake Roosevelt National Recreation Area jurisdiction. Other technical observers were on-board the RV Monarch. Depending on river conditions and safety requirements, the RV Monarch would moor to the RV Palouse or remain motorized within a safe observational distance from the RV Palouse. Decisions regarding the monitoring safety and boat maneuvers were decided by the respective boat captains.

## 2 SCOPE OF WORK AND SAMPLING METHODOLOGY

This work was implemented under the SOPs, listed in Appendix C of the QAPP (Teck 2010). The SOPs provide guidance and instructions on boat positioning, field documentation, below-water grab sampling procedures, sample labeling and management, equipment decontamination, and chain-of-custody protocols.

### 2.1 SCOPE OF WORK

The primary locations (LMF, UMF, CB, and DME) were first visited to collect samples. The alternate locations (LD and NP) were subsequently visited in an attempt to fulfill the sample volume requirements, as necessary.

The scope of work for the sediment sampling program included:

- Coordinating and scheduling the field sampling program with Teck, subcontractors, and technical observers or representatives from the various government agencies and participating parties.
- Obtaining and decontaminating 5-gallon HDPE containers, sampling equipment, materials, and supplies, monitoring equipment such as cameras, hand-held global positioning system (GPS) units, and decontamination supplies per the QAPP.
- Preparation of a project-specific Health and Safety Plan for URS and subcontractors.
- Obtaining and/or preparing field documentation, such as field sample logs, chain-of-custodies, field record notebooks, and related location and station coordinate references for field use.
- Mobilizing equipment, boats and sampling teams to the field.
- Conducting a daily review of sample procedures, boat operations, and health and safety protocols during each morning meeting prior to field activities.
- Collecting daily attendance records and health and safety signature acceptance from each of the participants (Appendix B).
- Conducting station sampling and recording pertinent field data as outlined in the QAPP.
- Transferring of sediment samples at the completion of each day's field activities to representatives of the University of Saskatchewan Environmental Toxicology Center using chain-of-custody protocols outlined in the QAPP.

## 2.2 SAMPLING METHODOLOGY

This section describes the general methods used for sampling at each station of the four primary and two alternate locations. Site-specific observations and methods are discussed in Section 3.

### 2.2.1 SAMPLE LABELING

The sampling identification and labeling was derived from SOP-5. As previously referenced, each location was assigned an abbreviation (e.g., Little Marcus Flats was abbreviated to LMF). Tables 1 through 6 and Appendix C provide the sample labeling matrix based on the following description.

Each of the three stations at each of the six primary and alternate locations (LMF, UMF, CB, DME, NP, and LD) was assigned a suffix representing the 18 individual stations. For example, the three stations at LMF were labeled with sequential station numbers LMF-01 through LMF-03 (also referenced in Section 1.2 above). The three stations at each of the six primary and alternate locations were also assigned a sediment sample number SD0001 to SD0018, representing the 18 stations.

A separate sample identification matrix was also employed to label individual grab samples or aliquots. A unique sample identifier was assigned to each of the ten grab samples or aliquots for each of the three stations at the six locations. This unique sample identifier was comprised of three codes representing the location (e.g., LMF), the station number within that location (LMF-01), and a three digit sequential number for each of the 10 grab samples per station. For example, station LMF-01 consisted of ten grab samples which were labeled LMF-01-001 to LMF-01-010. Each grab sample consisted of the sample matrix contained in a single 5-gallon HDPE container. For reference, the 10 grab samples (containers) at LMF-01-001 to LMF-01-010 to be composited by the laboratory from station LMF-01 were also labeled under the common sample number SD0001.

The unique sample identifier was only used to provide a specific reference to the individual grab samples. This number was recorded on the daily field logs (Appendix C), but was not recorded on the chain of custodies.

In addition to the unique sample identifier, each of the 5-gallon HDPE containers was assigned a specific sequential container tag number. The container tag number consisted of the letter "T" followed by a sequential three digit number for each 5-gallon HDPE container. The container tag numbers ranged from T001 through T180. For reference, each unique sample identifier was linked to a specific container tag number. With 18 stations and ten grab samples or aliquots per station, there were up 180 individual container tag numbers required for the project. For example, the first of ten grab samples for sample number SD0001 at station LMF-01 was assigned the unique identifier LMF-01-001 and placed into a single 5-gallon HDPE container labeled T001. Tables 1 through 6 provide a complete summary of the correlating tag number with the respective station sample number and individual unique sample identifier.

The chain-of-custodies were completed with the station sample number (e.g., SD0001) and the container tag numbers, segregated by station on individual forms. For example, sample number SD0001 (from station LMF-01) consisted of ten container tag numbers T001 through T010.

### 2.2.2 DECONTAMINATION

Decontamination of field sampling equipment ensures sample integrity and minimizes cross-contamination during sample handling. Decontamination methods followed those outlined in SOP-8 (Appendix C of the QAPP). The following decontamination procedures were used for field equipment, including the pneumatic-operated stainless steel Power Grab Sampler (provided by Gravity), Lexan collection tubs and sample scoops, and 5-gallon HDPE containers:

- The 5-gallon HDPE containers and Lexan sample scoops were wrapped and sealed in plastic wrap prior to transport to the field.
- All sample equipment and the 5-gallon HDPE containers were decontaminated prior to sample collection at each of the stations. The decontamination procedure included spraying with a dilute Liquinox™ solution, followed by washing and scrubbing using a plastic brush with rigid bristles on the inside and outside surfaces. The wash procedure was followed by a de-ionized water rinse and plastic brush scrub. The sampling equipment was then rinsed with a dilute acid solution (5% nitric acid), followed by another de-ionized water rinse.



Decontamination rinse of the Power Grab Sampler using de-ionized water

- Decontamination fluids or investigation derived wastes (IDW) were collected into a plastic tub placed below the Power Grab Sampler and sampling equipment. The IDW was then transferred to a sealed container for waste management protocols.

- The IDW container was labeled with information on the contents, dates, and URS contact information. IDW was transported to shore and managed off-site.



Collection of IDW into 5-gallon HDPE container

### 2.2.3 SAMPLING COLLECTION METHODS AND PROTOCOLS

Sampling methods and protocols used were defined in SOP-1 through SOP-6 and SOP-8 of the QAPP. The SOPs were developed to ensure that high quality representative samples were collected.



View of work area on-board the RV Palouse

***Boat Positioning at Sample Stations.*** Accurate station positioning is required to help ensure quality and consistency in collecting samples and in data interpretation and analysis. The sample boat RV Palouse was maneuvered to the best of the captain's ability to the center of the individual station GPS coordinates provided in the Amended QAPP (June 2010). Nobeltec™ marine navigation software and GPS antenna connected to a Panasonic Toughbook™ laptop was employed by the RV Palouse captain to manage the boat position.



Cabin view of GPS system used for navigation and station positioning

The GPS antenna was located on the top of the boat's forward boom, directly over the Power Grab Sampler.



Nobeltec™ antenna located on top of forward boom over the Power Grab Sampler

Several methods were employed by the Gravity boat captain to maintain navigation and sample collection positioning within the 20-meter (66-foot) diameter station.

- The boat captain maintained position within the station perimeter under power when slack water, eddy or slow river currents allowed for safe maneuvering; or river bottom composition prevented anchoring (e.g., cobbles and boulders).
- The boat captain set fore and aft anchors when slow to moderate river currents or other conditions required a more stable and safe position for sampling. The two anchor lines were alternately lengthened or shortened to move the boat within the station.
- The boat captain set a buoy to establish the center of the station coordinate or the edge of the 10-meter radius upstream of the station coordinate center when moderate to swift river currents and river bottom composition precluding safe anchorage.

**Sample collection.** The boat captain maneuvered the boat to the station and/or buoy marker, and then signaled the crew to lower the Power Grab Sampler. The Power Grab Sampler was lowered to the river bottom at an approximate rate of 30 centimeters per second (cm/sec) [one foot per second (ft/sec)]. Upon contact with the river bottom, the pneumatic-powered Power Grab Sampler was activated to close the clam-shell sides and collect the sediment sample.





Lowering the Power Grab Sampler for sediment sampling

The Power Grab Sampler was then raised to the surface at an approximate rate of 30 cm/sec (one ft/sec) and maneuvered over the deck using the boom. The Power Grab Sampler was then inspected by URS personnel for acceptability per the criteria provided in SOP-4.



Lowering the Power Grab Sampler onto the boat deck and release of sediment into Lexan tub

Grab samples not meeting the criteria as detailed within SOP-4 were rejected and the steps repeated until a competent sample was collected. The deployments were completed within the station coordinate area of 20 meters (66 feet). A minimum of three attempts were made at each station based on the SOP-4 criteria. If the sample criteria were not met after three or more attempts, then the sampling was discontinued for that station.

Based on the 5-gallon sample volume, two to three Power Grab Sampler collections were required to fill the HDPE container.

***Sample documentation.*** The sediment in the interior of the Power Grab Sampler was examined per SOP-4 after being maneuvered over the deck. If accepted, the sample was released into the Lexan tub and visual observations recorded using a station-specific field log. Each log was labeled with the location (e.g., DME), station (e.g., 01 through 03), grab sample number (e.g., 001 through 010), unique sample identifier (e.g., DME-01-010), and sequential container tag number (e.g., T001).

Photographs were taken of the grab samples and identified within the photographic record using a white board with date, time, station container tag number (e.g., T001), and field status (as applicable). Photographs for the samples and processes are provided in Appendix D.

Monitoring observations recorded for each sample included: physical characteristics such as color, textural classification (visual/manual method), visible organic matter, obvious abnormalities, sample penetration, presence or absence of cultural resources, boat and sampler information, sample date and time, and photographic directory and file name.

The grab sample UTM coordinates were obtained using two hand-held GPS units located in the RV Palouse cabin. The GPS readings were recorded when the Nobletec™ system positioning indicated the boat was within the coordinate boundary. River depths were recorded from the RV Palouse fathometer. Copies of the sediment field logs for the four primary and the two alternate location stations are provided in Appendix C.

Sediment was transferred from the Lexan tub to the grab sample 5-gallon HDPE container using a Lexan scoop. The HDPE container would be filled and the surface covered with residual river water from the Lexan tub. Each 5-gallon HDPE container was labeled on the lid and side with information on the date, time, sample number, container number, and sampler name.



Sediment sample transfer from Lexan tub to 5-gallon HDPE container

The 5-gallon HDPE container lids were self-sealing, water and air-tight, and tamper-resistant. The lids are designed to only allow access through cutting the lip edge at several places with a knife or cutters, removing a tab encircling the lid's circumference, and pulling upward.

Grab samples not meeting the criteria were temporarily placed in a separate tub until the station sampling was completed. Rejected materials were then placed back into the river at the approximate point of collection.

Field notes, observations, and activities were also documented using an environmental field notebook. A copy of the environmental field notebook is provided in Appendix E.

The URS registered professional archaeologist and other cultural resources technical observers observed the individual grab samples for evidence of potential cultural resources. Refer to Appendix A for a detailed summary of on-site cultural observations and records.

***Sample Handling and Chain-of-Custody Protocol.*** At the close of the day's sampling efforts, the grab sample containers were transported to shore and transferred to the boat dock to University of Saskatchewan personnel. The grab sample containers were placed into a refrigerated truck provided by the university. The refrigerated truck door was then closed and sealed with a keyed lock. A daily chain-of-custody was prepared for samples and signed by the URS sampler and the university representative. Copies of the chain-of-custodies are provided in Appendix F.



Transfer of grab sample containers to the refrigerated truck

## 2.3 HEALTH AND SAFETY

All technical observers read and signed the UCR General Health and Safety Plan (August 25, 2009). URS personnel and subcontractors read and signed the URS project-specific Site Health and Safety Plan (May 10, 2010) for the UCR sediment sampling project. URS and subcontractor field personnel employed on this project have taken the Occupational Safety and Health Administration 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and were current on 8-hour HAZWOPER refresher training. Daily health and safety “tailgate” meetings were conducted during implementation of field activities. Appendix F presents health and safety agreement forms signed by the technical observers and URS field crews. There were no reportable, recordable, or near-miss health and safety incidents during implementation of the work.

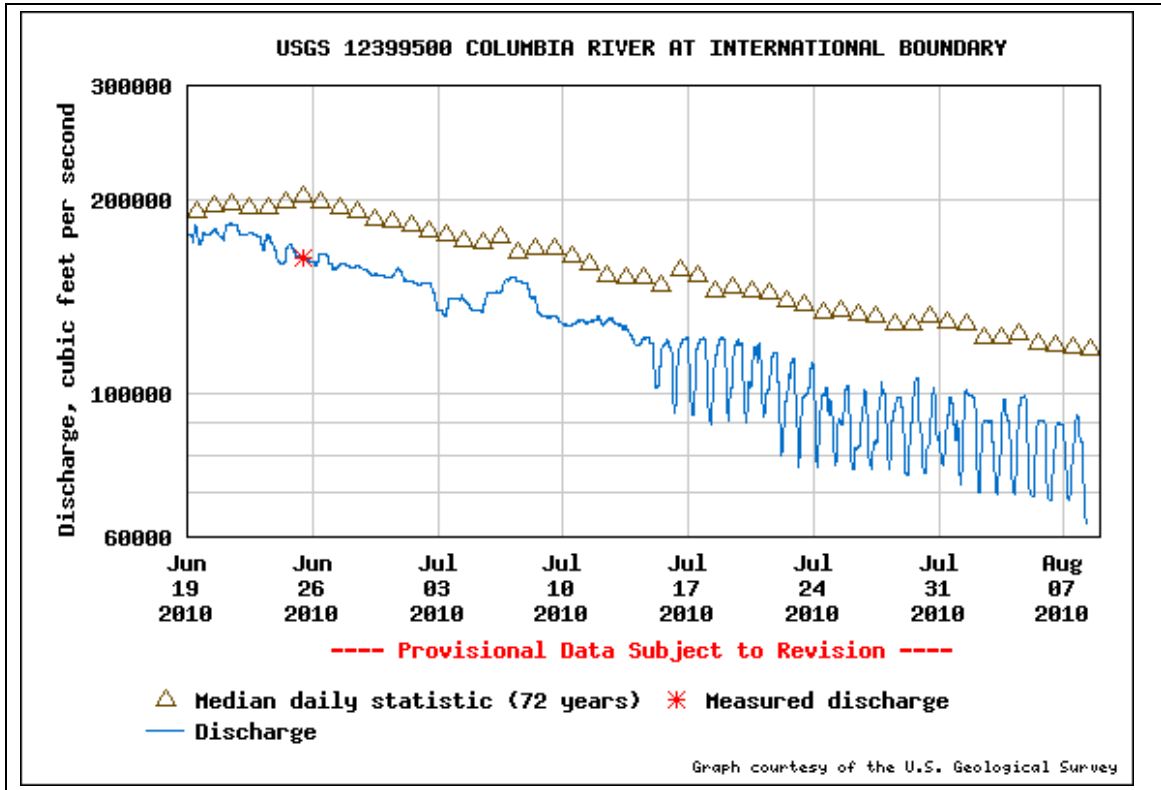
## 3 SEDIMENT SAMPLE COLLECTION

This section describes specific river conditions and sampling at the individual locations, and stations within the locations. Field observations are presented in order of sampling, beginning with the primary locations LMF, UMF, CB, and DME; followed by the alternates NP and LD. Sample collection for each station followed the sampling methodology presented in Section 2.2 and outlined in the QAPP.

### 3.1 GENERAL FIELD CONDITIONS

In general, ambient air temperatures ranged from the low-50s to high-80s degrees Fahrenheit with partly sunny to sunny skies during the sampling event. Weather conditions allowed for a good sampling environment.

Locations were positioned within moving water areas of the UCR (Map 1). Daily river flows reported by the U.S. Geological Survey (USGS) ranged from 177,000 cubic feet per second (cfs) beginning on June 22 to 159,000 cfs on June 27, 2010 at the International Boundary (U.S./Canada) gauging station. Median and average flows reported during this time were 139,000 cfs and 150,000 cfs, respectively.



Source: USGS National Water Information System – Web Interface  
[http://waterdata.usgs.gov/wa/nwis/uv/?site\\_no=12399500&PARAMeter\\_cd=00060,00065](http://waterdata.usgs.gov/wa/nwis/uv/?site_no=12399500&PARAMeter_cd=00060,00065).

The relatively high river flow conditions created challenging boat maneuvering and sampling conditions, particularly in the narrower sections, upstream eddy flows, and reflective or side currents. The conditions required careful maneuvering by the boat captain to maintain positioning of the 28 foot RV Palouse within the 20 meter (66 feet) station diameter. Coarse river bottom composition in several areas created conditions that made anchoring and sediment sampling difficult.

Several conditions prevented the collection of competent samples and required the rejection of samples based on SOP-4 criteria. Samples with visual evidence of winnowing and washing within the Power Grab Sampler were rejected. Coarse materials such as gravels, cobbles, boulders limited or prevented sample collection by deflecting the Power Grab Sampler or preventing closure by blocking the closing mechanism and clam-shell sides. Wood debris also limited the collection of competent samples at several stations by blocking the sampler.

Tables 1 to 6 provide a summary of the sample identification and other relevant information for each location. Maps 2 through 7 provide plan views of the locations and

stations based on the QAPP coordinate centers and field-recorded grab sample coordinates. The GIS data is presented using ArcGIS 9.3.

## 3.2 LOWER MARCUS FLATS

Samples were collected at three stations (LMF-01 through LMF-03) at this location on June 22 and 23, 2010. Table 1 provides a summary of the individual grab sample field logs (Appendix C), including information on sample identifiers, coordinates, sediment characteristics, general field notes, sample success or rejection, and photographic record. Map 2 provides a plan view of the individual grab sample locations, including where samples were collected or refused per SOP-4 and related QAPP criteria.

### 3.2.1 SAMPLING RESULTS

A total of 16 grab samples were collected from stations LMF-01 through LMF-03. The following is a summary of observations from the three stations.

**LMF-01.** Station LMF-01 is labeled sample number SD0001. Ten grab samples were collected from station LMF-01 and assigned the unique identifiers LMF-01-001 to LMF-01-010 and the container tag numbers T001 to T010.

The predominant sediment characteristic for LMF-01 consisted of very dark gray to black silt (river mud) with low plasticity. Very fine sand was unevenly distributed in the samples. Decomposing organic matter and lighter yellowish brown streaking was observed within the samples. Small diameter (1 to 2 mm) roots were also observed. A slight musky or sewage-type odor was detected in most samples.

No obvious abnormalities, flora, or fauna was observed at LMF-01.

Water depths at LMF-01 ranged from approximately 18 to 20 meters (59 to 66 feet); with slow to slack water conditions based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

**LMF-02.** Station LMF-02 is identified sample number SD0002. Five grab samples were collected from station LMF-02 and assigned the unique identifiers LMF-02-001 to LMF-02-005 and the container tag numbers T011 to T015.

The predominant sediment characteristics for LMF-02 consisted of very dark grayish brown silt and black poorly graded fine sands. Sample recovery observations indicate the fine black sands were overlain by or mixed with silt deposits of low plasticity. Wood debris consisting of stems, bark, pine cones, other fragments was prevalent. The presence of wood debris limited or prevented obtaining competent grab samples according to SOP-4. Winnowing and washing was observed following recovery, therefore requiring sample rejection. Several attempts were made at each of the five successful grab sample locations at LMF-02-001 through LMF-02-005.

The subsequent attempts for the remaining grabs samples were rejected due to these materials blocking closure of the Power Grab Sampler. Winnowing and washing was

observed following recovery, therefore requiring sample rejection. Small diameter (1 to 2 mm) roots were observed and a slight musky or sewage-type odor was detected in most samples.

Red leeches were observed in several samples. There were no other obvious abnormalities, flora, or other fauna observed at LMF-02.

Water depths at LMF-02 ranged from approximately 41 to 46 meters (135 to 151 feet); with flows ranging from slow to slack water conditions based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

**LMF-03.** Station LMF-03 is labeled sample number SD0003. One grab sample was collected from station LMF-03 and assigned the unique identifier LMF-03-001 and the container tag number T021.

The predominant sediment characteristic for LMF-03 consisted of dark grayish brown to dark yellowish brown silt and a variable color matrix of sands and gravels of mixed parent materials. The sample recovery observations indicate the sands and gravels were overlain or mixed with the silt deposits. Larger cobbles were also present. Wood debris consisting of stems and branches, and other organic litter was prevalent on or under the surface. No odors were detected in the samples.

No obvious abnormalities, flora, or fauna was observed at LMF-03.

Water depths at LMF-03 ranged from approximately 27 to 29 meters (89 to 95 feet); with flows ranging from slow to slack water conditions based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists. A small piece of lumber was recovered in unique sample identifier LMF-03-001, but was not considered of importance to the archaeological monitors.

The presence of wood debris, gravels, and cobbles limited or prevented obtaining additional competent grab samples at LMF-03. The subsequent grab samples were rejected due to these materials blocking closure of the Power Grab Sampler. Winnowing and washing was observed following recovery, requiring sample rejection.

### 3.3 UPPER MARCUS FLATS

Samples were collected at three stations (UMF-01 through UMF-03) at this location on June 23 and 24, 2010. Table 2 provides a summary of the individual grab sample field logs (Appendix C); including information on sample identifiers, coordinates, sediment characteristics, general field notes, sample success or rejection, and photographic record. Map 3 provides a plan view of the individual grab sample locations, including where samples were collected or refused per SOP-4 and related QAPP criteria. A total of 30 grab samples were collected from stations UMF-1 through UMF-3. The following is a summary of observations from the three stations.

**UMF-01.** Station UMF-01 is labeled sample number SD0004. Ten grab samples were collected from station UMF-01 and assigned the unique identifiers UMF-01-001 to UMF-01-010 and the container tag numbers T031 to T040.

The predominant sediment characteristic for UMF-01 consisted of very dark gray to very dark grayish brown well-graded sands. The sand matrix was comprised of mixed parent materials, with varying amounts of lighter colored sands with darker sands, giving a “salt and pepper” appearance. Samples included varying amounts of low-plasticity silt. The sand component was generally overlain by or layered with the silt deposits. Decomposing organic matter and wood debris consisting of stems, bark, roots, and other fragments were prevalent on or under the surface. No odors were detected in the samples.

A freshwater mussel was observed in grab sample UMF-01-005. There were no other obvious abnormalities, flora, or other fauna observed.

Water depths at UMF-01 ranged from approximately 29 to 30 meters (95 to 98 feet); with flows ranging from slow to slack water conditions based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

**UMF-02.** Station UMF-02 is labeled sample number SD0005. Ten grab samples were collected from station UMF-02 and assigned the unique identifiers UMF-02-001 to UMF-02-010 and the container tag numbers T041 to T050.

The predominant sediment characteristic for UMF-02 consisted of very dark grayish brown silt or river mud of low plasticity. Decomposing organic matter and dark streaking was observed within the samples. Dark reddish brown mottling or streaking was observed in several samples. Small amounts of fine wood debris (e.g., leaves) were observed within the samples. A slight sulfur odor was detected in most samples.

Sparse growth of short, green grasses was observed on the sediment surface in most samples. Red leeches were observed in several samples. There were other no obvious abnormalities, flora, or fauna observed at UMF-02.

Water depths at UMF-02 ranged from approximately 10 to 11 meters (33 to 36); with flows ranging from slow to slack water conditions based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

**UMF-03.** Station UMF-03 is labeled sample number SD0006. Ten grab samples were collected from station UMF-03 and assigned the unique identifiers UMF-03-001 to UMF-03-010 and the container tag numbers T051 to T060.

The predominant sediment characteristic for UMF-03 consisted of very dark gray silt or river mud of low plasticity. Decomposing organic matter and dark streaking was observed within the samples. Dark reddish brown mottling or streaking was observed in several samples. Small amounts of fine wood debris (e.g., leaves, pine needles) were observed within the samples. A slight musky odor was detected in most samples.



No obvious abnormalities, flora, or fauna was observed at UMF-03.

Water depths at UMF-03 ranged from approximately 16 to 19 meters (53 to 62 feet); with flows ranging from slow to slack water conditions based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

### 3.4 CHINA BEND

Field sampling at the three stations (CB-01 through CB-03) was conducted on June 25, 2010. Table 3 provides a summary of the individual grab sample field logs (Appendix C), including information on sample identifiers, coordinates, sediment characteristics, general field notes, sample success or rejection, and photographic record. Map 4 provides a plan view of the individual grab sample locations, including where samples were collected or refused per SOP-4 and related QAPP criteria.

#### 3.4.1 SAMPLING RESULTS

No competent grab samples could be collected from stations CB-01 through CB-03. The following is a summary of observations from the three stations.

**CB-01.** Station CB-01 is labeled sample number SD0007. No competent grab samples could be collected from station CB-01.

The predominant sediment characteristic for CB-01 was difficult to define based on field conditions. Limited amounts of dark grayish brown sand were partially recovered in several Power Grab Sampler deployments. A cobble/boulder was observed in one sample attempt. The presence of odors could not be observed based on the sampling conditions. Similarly the presence of obvious abnormalities, flora, or fauna could not be observed based on the sampling conditions.

Water depths at CB-01 ranged from approximately 17 to 18 meters (56 to 59 feet); with moderate flows based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

River flows and depths in conjunction with the presence of gravels, cobbles or boulders contributed to the unsuccessful attempts to collect competent samples. Winnowing and washing of sample material was observed in recovery, requiring sample rejection.

**CB-02.** Station CB-02 is labeled sample number SD0008. No competent grab samples could be collected from station CB-02.

The predominant sediment characteristic for CB-02 was difficult to define based on field conditions. A trace amount of dark grayish brown sand and some silt was partially recovered in one deployment attempt. Boulders and/or cobbles were also suspected as a primary component of the river bottom based on recovery of a cobble/boulder in CB-01. The presence of odors could not be detected based on the sampling conditions. Similarly, the presence of obvious abnormalities, flora, or fauna could not be observed.

Water depths at CB-02 ranged from approximately 16 to 17 meters (53 to 56 feet); with moderate flows based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

Several sample collection methods and samplers were attempted at CB-02 to obtain competent samples. River flows and depths and the possible presence of cobbles or boulders appeared to limit the ability of the Power Grab Sampler (please insert the dimensions) to maintain a proper scope or to settle onto the river bottom. Similar unsuccessful attempts were encountered in deploying a messenger-type van Veen sampler (please insert the dimensions – L and W).

A buoy was also used to mark the station center coordinate with the Power Grab Sampler, which was lowered from that position. However, the river current and depth limited the ability to maintain boat position within the 20 meter (66 feet) diameter. A second method was employed with the buoy placed at the station radius boundary, marked at 10 meters (33 feet) upstream from the station coordinate center. However, both techniques did not improve on the ability to collect samples.

**CB-03.** Station CB-03 is labeled sample number SD0009. No competent grab samples could be collected from station CB-03.

The predominant sediment characteristic for CB-03 was difficult to define based on the field conditions. Dark grayish brown sands and silt were partially recovered; while gravels and cobbles of mixed parent material were primarily recovered and appeared to represent the larger volume. Wood debris was also prevalent at CB-03, and included large limbs and branches. The presence of odors could not be detected based on the sampling conditions.

Vegetation (unclassified) was recovered in several sample attempts. The presence of other obvious abnormalities, flora, or fauna was not or could not be observed based on sampling conditions.

Water depths at CB-03 ranged from approximately 13 to 14 meters (43 to 46 feet); with slow to moderate flows based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

The presence of gravel, cobbles, and wood debris however adversely affected sampling efforts and contributed to the rejected attempts. Winnowing and washing of the sample was present in recovery attempts.

### 3.5 DEADMANS EDDY

Three stations identified as DME-01 through DME-03 were sampled at this location on June 26, 2010. Table 4 provides a summary of the individual grab sample field logs (Appendix C), including information on sample identifiers, coordinates, sediment characteristics, general field notes, sample success or rejection, and photographic record.

Map 5 provides a plan view of the individual grab sample locations, including where samples were collected or refused per SOP-4 and related QAPP criteria.

### 3.5.1 SAMPLING RESULTS

No competent grab samples collected from stations DME-01 through DME-03. The following is a summary of observations from the three stations.

***DME-01.*** Station DME-01 is labeled sample number SD0010. No competent grab samples could be collected from station DME-01.

The predominant sediment characteristic for DME-01 was cobble to boulder sized materials of varying colors and parent sources. Limited amounts of mixed color sands were partially recovered in a few deployments. The presence of odors could not be detected based on the sampling conditions. Similarly, the presence of obvious abnormalities, flora, or fauna could not be observed based on the sampling conditions.

Water depths at DME-01 ranged from approximately 3 to 4 meters (10 to 13 feet); with moderate flows based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

There were several attempts made at DME-01 to obtain competent samples. The river flow and bottom composition however contributed to the rejected attempts to collect competent samples.

***DME-02.*** Station DME-02 is labeled sample number SD0011. No competent grab samples could be collected from station DME-02.

The predominant sediment characteristic for DME-02 was cobble sized materials of varying colors and parent sources. Limited amounts of mixed color sands were partially recovered in a few deployments. The presence of odors could not be detected based on the sampling conditions. Similarly, the presence of obvious abnormalities, flora, or fauna could not be observed based on the sampling conditions.

Water depths at DME-02 ranged from approximately 10 to 11 meters (33 to 36 feet); with slow to moderate flows based on visual observations.

No cultural resources were observed by the URS archaeologist.

River flow and bottom composition however contributed to the rejected attempts to collect competent samples.

***DME-03.*** Station DME-03 is labeled sample number SD0012. No competent grab samples could be collected from station DME-03.

The predominant sediment characteristic for DME-03 could not be determined. Boulders and bedrock were suspected on the river bottom based on onshore observations of the surrounding area parent material. The presence of odors could not be detected based on

the sampling conditions. Similarly, the presence of obvious abnormalities, flora, or fauna could not be observed based on the sampling conditions.

Water depths at DME-03 ranged from approximately 5 to 6 meters (16 to 20 feet); with moderate flows based on visual observations.

No cultural resources were observed by the URS archaeologist.

River flow and bottom composition however contributed to the rejected attempts to collect competent samples.

### 3.6 NORTHPORT

Three stations, NP-01 through NP-03, were sampled at this location on June 27, 2010. Table 5 provides a summary of the individual grab sample field logs (Appendix C), including information on sample identifiers, coordinates, sediment characteristics, general field notes, sample success or rejection, and photographic record. Map 6 provides a plan view of the individual grab sample locations, including where samples were collected or refused per SOP-4 and related QAPP criteria.

#### 3.6.1 SAMPLING RESULTS

Three competent grab samples were collected from stations NP-1 through NP-3. The following is a summary of observations from the three stations.

**NP-01.** Station NP-01 is labeled sample number SD0016. No competent grab samples could be collected from station NP-01.

The predominant sediment characteristic for NP-01 was well graded yellowish brown and black sands with gravels, cobbles, and boulder sized materials of varying colors and mixed parent materials. The presence of odors could not be detected based on the sampling conditions. Similarly, the presence of obvious abnormalities, flora, or fauna could not be observed based on the sampling conditions.

Water depths at NP-01 ranged from approximately 8 to 9 meters (26 to 30 feet); with relatively slow flows based on visual observations.

No cultural resources were observed by the URS archaeologist.

River bottom composition however contributed to the rejected attempts.

**NP-02.** Station NP-02 is labeled sample number SD0017. No competent grab samples could be collected from station NP-02.

The predominant sediment characteristic for NP-02 could not be determined. Boulders and bedrock of varying parent materials were identified as comprising the river bottom based on observations of the onshore ground surfaces and visible river bottom. Limited amounts of mixed color sands were partially recovered in a few deployments. The presence of odors could not be detected based on the sampling conditions. Similarly, the

presence of obvious abnormalities, flora, or fauna could not be observed based on the sampling conditions.

Water depths at NP-02 ranged from approximately 5 to 7 meters (16 to 23 feet); with moderate flows based on visual observations.

No cultural resources were observed by the URS archaeologist.

River flow and bottom composition however contributed to the rejected attempts to collect competent samples.

**NP-03.** Station NP-03 is labeled sample number SD0018. Three grab samples were collected from station NP-03 and assigned the unique identifiers NP-03-001 to NP-03-003 and the container tag T171 to T173.

The predominant sediment characteristic for NP-03 was poorly graded dark brown sands with gravel sized materials of varying colors and parent sources. Wood debris comprised of bark and other litter was observed. No odors were detected in the samples. No obvious abnormalities, flora, or fauna were observed.

Water depths at NP-03 ranged from approximately 5 to 6 meters (16 to 20 feet); with slow flows based on visual observations.

No cultural resources were observed by the URS archaeologist.

Coarse substrate (i.e., gravels) prevented closure of the sampler and contributed to the rejected attempts.

## 3.7 LITTLE DALLES

Three stations, LD-01 through LD-03, were sampled at this location on June 27, 2010. Table 6 provides a summary of the individual grab sample field logs (Appendix C), including information on sample identifiers, coordinates, sediment characteristics, general field notes, sample success or rejection, and photographic record. Map 7 provides a plan view of the individual grab sample locations, including where samples were collected or refused per SOP-4 and related QAPP criteria.

### 3.7.1 SAMPLING RESULTS

Ten competent grab samples were collected from stations LD-01 through LD-03. The following is a summary of observations from the three stations.

**LD-01.** Station LD-01 is labeled sample number SD0013. Ten grab samples were collected from station LD-01 and assigned the unique identifiers LD-01-001 to LD-01-010, and the container tag numbers T121 to T130.

The predominant sediment characteristic for LD-01 consisted of poorly graded black fine sands. Limited amounts of yellowish brown sand grains were also present. Decomposing

wood debris consisting primarily of bark and other small fragments were present. No odors were detected in the samples.

Small snails and shells (5 to 15 mm) were observed in most of the grab samples. A tennis shoe was recovered in one grab sample (LD-01-006). There were no other obvious abnormalities, flora, or other fauna observed.

Water depths at LD-01 ranged from approximately 20 to 23 meters (66 to 75 feet); with slow to slack flows noted based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

**LD-02.** Station LD-02 is labeled sample number SD0014. No competent grab samples were collected from station LD-02.

The predominant sediment characteristic for LD-02 was gravel to cobble sized materials of varying colors and mixed parent materials. Limited amounts of well-graded very dark grayish brown sands were observed. The presence of odors could not be detected based on the sampling conditions. Similarly, the presence of obvious abnormalities, flora, or fauna could not be observed based on the sampling conditions.

Water depths at LD-02 ranged from approximately 22 to 23 meters (72 to 75 feet), with moderate flows based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

River flow and bottom composition however contributed to the rejected attempts to collect competent samples.

**LD-03.** Station LD-03 is labeled as sample number SD0015. No competent grab samples were collected from station LD-03.

The predominant sediment characteristic for LD-03 was gravel- to cobble-sized materials of varying colors and mixed parent materials. Boulders were also visually observed on the river bottom. There were no sands or silt observed in the sample attempts. The presence of odors could not be detected based on the sampling conditions. Similarly, the presence of obvious abnormalities, flora, or fauna could not be observed based on the sampling conditions.

Water depths at LD-03 ranged from approximately 4 to 5 meters (13 to 16 feet), with moderate flows based on visual observations.

No cultural resources were observed by the URS or NPS archaeologists.

River flow and bottom composition however contributed to the rejected attempts to collect competent samples.

### 3.8 SAMPLE PROTOCOL DEVIATIONS

Deviations from the QAPP SOP-4 were implemented based on previously agreed-to sample collection methods due to field conditions.

***Lexan Sample Equipment.*** The SOP-4 procedure for transferring the sediment sample from the sampler (e.g., van Veen) to the 5-gallon HDPE container is as follows (page 4, paragraph 1): “Next, a decontaminated stainless steel trowel or spoon may be used to collect only the upper 10 to 15 centimeters (4 to 6 inches) of sediment from inside the sampler, without touching the sidewalls.”

A large volume of sediment sample was required for the study and field procedures included the use of a stainless steel Power Grab or van Veen Sampler. The field procedure utilized in the UCR sediment program was based on the use of the pneumatic-actuated Power Grab Sampler. The Power Grab Sampler was raised to the deck and after visual observations for criteria acceptance, the sediment sample was released into a Lexan tub. The sediment sample from these large samplers was transferred to a Lexan tub and then to the 5-gallon HDPE containers with Lexan scoops.

Lexan is a brand of polycarbonate resin thermoplastic. Lexan resin formulations are approved for food-contact and biocompatibility in medical applications. It is an accepted inert sample equipment material, often used in place of stainless steel products. Lexan equipment is identified for use by the EPA (References - EPA, 2001 and 2003) and is an approved material for soil and sediment sample collection, including box samplers, core and piston samplers, core tubes and caps, and containers.

***Grab Sample Attempts.*** The SOP-4 criteria for grab sample attempts is outlined as follows (page 3, paragraph 4): “Grab samples not meeting these criteria will be rejected near the location of sample collection and steps repeated until the criteria have been met or until three attempts at a location have rejected.”

Field conditions limited or prevented the collection of competent samples at many locations and the subset stations, including moderate river flows, gravel, cobble, and boulder river bottom composition, and the presence of wood debris.

The protocol was field-amended to include additional sample recovery attempts at the stations in addition to the minimum three attempts outlined in SOP-4, with the objective to obtain the large sediment volumes required for the study.

***GPS Satellite Acquisition.*** A temporary and simultaneous loss of satellite acquisition for the two hand-held GPS units was encountered at two grab sample locations. The two episodes included the grab sample attempts at station CB-01, where no competent grab samples could be collected; and the UTM easting coordinate for station LD-01, specifically for unique sample identifier LD-01-006 (container tag number T126).

For these two events, the RV Palouse’s Nobeltec system was used by the captain to maneuver the boat to the coordinate center and then signal the release of the Power Grab Sampler. Due to the river current and depth (17 to 18 meters) a buoy marker was used at

CB-01 to assist mark the station coordinate. Sample coordinates for these two grab samples are reported in the attached table summaries as the station center.

#### 4 LIMITATIONS

This report has been prepared for the exclusive use of Teck American Incorporated to provide a summary of the 2010 sediment study field work on the UCR for white sturgeon toxicity tests. The work conducted by URS is limited to the services agreed to with Teck, and no other services beyond those explicitly stated should be inferred or are implied.

This report is intended exclusively for the purposes outlined herein and the project and site indicated. It should be recognized that this work was not intended to be a definitive investigation of the site and the conclusions provided are not necessarily inclusive of all the possible conditions.

Opinions and recommendations presented herein apply to the conditions existing at the time of our investigations and cannot necessarily apply to changes of which URS is not aware and has not had the opportunity to evaluate. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond our control.

URS' objective is to perform our work exercising the customary standard of care, in accordance with the standard for professional services for a national consulting firm at the time these services are provided. No expressed or implied representation or warranty is included or intended in our reports except that our work was performed, within the limits prescribed by our client, in accordance with the customary and professional standard of care described herein.



## 5 REFERENCES

- U.S. Environmental Protection Agency (EPA). 2001. Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual. Office of Water. EPA-823-B-01-002. October.
- U.S. EPA. 2003. Literature Review and Report, Surface-Sediment Sampling Technologies. Prepared by Tetra Tech EM Inc. Project No. G1058.3.1.03.104.02. July.
- Teck American Incorporated (Teck). 2010. Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon. Prepared by Integral Consulting Inc., Parametrix, and HydrolQual, Inc. May, Amended June.
- Teck. 2009. UCR General Health and Safety Plan. Prepared by Integral Consulting Inc., Parametrix, and HydrolQual, Inc. August.
- URS Corporation (URS). 2010. Site Health and Safety Plan for the White Sturgeon Sediment Toxicity Study, Field Sampling Sediments, Upper Columbia River RI/FS. May.

## TABLES

Field Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010



**Table 1**  
**Lower Marcus Flats**  
**Sample Observations Summary**  
**UCR White Sturgeon Sediment Toxicity Study**

Station No.	Station Center Coordinates (NAD83) <sup>1</sup>	Sample Labeling			Grab Sample Coordinates			Sediment Characteristics			General Field Notes	Number of Grab Samples Collected	Cultural Resources		Photographic Record			
		Grab Sample Unique Identifier	Sample No.	Container Tag No.	Date Collected	Time Collected	Easting (UTM)	Northing (UTM)	Water Depth (m)	Sediment Texture (ASTM/USCS) <sup>2</sup>			Predominate Grain Size < 2mm <sup>2</sup>	Predominate Color < 2 mm (Munsell 10 YR) <sup>3</sup>	Observed?	URS Archaeologist	Photo Directory	Photo File(s)
LMF-01	UTM EASTING 419596.598	LMF-01-001	SD0001	T001	22-Jun-10	15:00	419591	5389530	19.4	ML	Yes	Very dark gray	Silt. Decomposing organic matter. Black and yellowish brown streaking.	1	No	M. Kelly	UCR Sed 6_22_2010	033-036
		LMF-01-002	SD0001	T002	22-Jun-10	15:20	419587	5389529	19	ML	Yes	Dark grayish brown		1			UCR Sed 6_22_2010	037-039
	UTM NORTHING 5389522.361	LMF-01-003	SD0001	T003	22-Jun-10	15:25	419591	5389529	19.3	ML	Yes	Black		1			UCR Sed 6_22_2010	040-041
		LMF-01-004	SD0001	T004	22-Jun-10	15:40	419594	5389529	19.6	ML	Yes	Black		1			UCR Sed 6_22_2010	042-043
		LMF-01-005	SD0001	T005	22-Jun-10	15:54	419598	5389530	19.7	ML	Yes	Very dark grayish brown		1			UCR Sed 6_22_2010	044-046
		LMF-01-006	SD0001	T006	22-Jun-10	16:12	419605	5389530	19	ML	Yes	Very dark gray		1			UCR Sed 6_22_2010	047-048
		LMF-01-007	SD0001	T007	22-Jun-10	16:30	419599	5389529	18.9	ML	Yes	Very dark gray to black		1			UCR Sed 6_22_2010	049-051
		LMF-01-008	SD0001	T008	22-Jun-10	16:35	419592	5389530	19.3	ML	Yes	Very dark gray to black		1			UCR Sed 6_22_2010	052-053
		LMF-01-009	SD0001	T009	22-Jun-10	16:50	419592	5389527	19.2	ML	Yes	Very dark grayish brown		1			UCR Sed 6_22_2010	054
		LMF-01-010	SD0001	T010	22-Jun-10	17:05	419590	5389529	19.6	ML	Yes	Very dark grayish brown		1			UCR Sed 6_22_2010	055-057
LMF-02	UTM EASTING 418470.318	LMF-02-001	SD0002	T011	23-Jun-10	9:50	418461	5390160	44.1	SP/ML	Yes	Black	Varying silt content mixed with black sands. Decomposing matter and wood debris of varying type and size. Red leeches. Poor recovery.	1	No	M. Kelly	UCR Sed 6_23_2010	069-080
		LMF-02-002	SD0002	T012	23-Jun-10	10:35	418461	5390160	44.3	SP/ML	Yes	Very dark grayish brown		1			UCR Sed 6_23_2010	081-084
	UTM NORTHING 5390165.566	LMF-02-003	SD0002	T013	23-Jun-10	10:55	418460	5390158	45.2	SP/ML	Yes	Very dark grayish brown		1			UCR Sed 6_23_2010	085-087
		LMF-02-004	SD0002	T014	23-Jun-10	11:15	418467	5390150	43.9	SP	Yes	Black		1			UCR Sed 6_23_2010	088-091
		LMF-02-005	SD0002	T015	23-Jun-10	11:35	418463	5390161	41.7	SP/ML	Yes	Black		1			UCR Sed 6_23_2010	092-095
		LMF-02-006	SD0002	T016	23-Jun-10	11:35	418473	5390166	42.8	SP/ML	Yes	Black		0			Varying silt content mixed with black sands. Wood debris blocks sampler and prevents collection of competent samples per SOP-4.	
		LMF-02-007	SD0002	T017	NS	NS	418472	5390166	41 - 46	SP/ML	Yes	Black		0				
		LMF-02-008	SD0002	T018	NS	NS	418473	5390165	41 - 46	SP/ML	Yes	Black		0				
		LMF-02-009	SD0002	T019	NS	NS	418474	5390165	41 - 46	SP/ML	Yes	Black		0				
		LMF-02-010	SD0002	T020	NS	NS	418473	5390167	41 - 46	SP/ML	Yes	Black		0				
LMF-03	UTM EASTING 418534.187	LMF-03-001	SD0003	T021	23-Jun-10	13:25	418537	5389419	28.9	GW/ML	Yes	Dark yellowish brown	Sands, gravels, and cobbles with few silts/ fines. Wood debris, gravels, and cobbles limit collection of competent sample per SOP-4.	1	No	M. Kelly	UCR Sed 6_23_2010	096-109
		LMF-03-002	SD0003	T022	23-Jun-10	13:40	418541	5389405	27.5	GW/ML	Yes	Dark yellowish brown		0			UCR Sed 6_23_2010	110-112
	UTM NORTHING 5389414.844	LMF-03-003	SD0003	T023	NS	NS	418541	5389406	27 - 29	GW/ML	Yes	Dark yellowish brown		0			Sands, gravels, and cobbles, with few silts/fines. Wood debris, gravels, and cobbles block sampler and prevent collection of competent samples per SOP-4.	
		LMF-03-004	SD0003	T024	NS	NS	418542	5389406	27 - 29	GW/ML	Yes	Dark yellowish brown		0				
		LMF-03-005	SD0003	T025	NS	NS	418542	5389404	27 - 29	GW/ML	Yes	Dark yellowish brown		0				
		LMF-03-006	SD0003	T026	NS	NS	418541	5389404	27 - 29	GW/ML	Yes	Dark yellowish brown		0				
		LMF-03-007	SD0003	T027	NS	NS	418540	5389404	27 - 29	GW/ML	Yes	Dark yellowish brown		0				
		LMF-03-008	SD0003	T028	NS	NS	418539	5389405	27 - 29	GW/ML	Yes	Dark yellowish brown		0				
		LMF-03-009	SD0003	T029	NS	NS	418540	5389406	27 - 29	GW/ML	Yes	Dark yellowish brown		0				
		LMF-03-010	SD0003	T030	NS	NS	418540	5389403	27 - 29	GW/ML	Yes	Dark yellowish brown		0				

**Table Notes**

- North American Datum, 1983, Universal Transverse Mercator (UTM) Zone 11
- Please refer to Appendix C Sediment Sample Field Logs for sediment texture descriptions  
Texture classification is based on professional opinion using visual observations of recovered sediments in sampler and other field conditions  
River bottom composition and sediment texture and distribution may vary from visual observations of rejected samples
- Munsell Soil Color Charts  
NS = sample rejected based on failure to meet QAPP SOP-4 criteria  
m = meters  
mm = millimeters



**Table 2**  
**Upper Marcus Flats**  
**Sample Observations Summary**  
**UCR White Sturgeon Sediment Toxicity Study**

Station No.	Station Center Coordinates (NAD83) <sup>1</sup>	Sample Labeling			Grab Sample Coordinates			Water Depth (m)	Sediment Characteristics			General Field Notes	Number of Grab Samples Collected	Cultural Resources		Photographic Record		
		Grab Sample Unique Identifier	Sample No.	Container Tag No.	Date Collected	Time Collected	Easting (UTM)		Northing (UTM)	Sediment Texture (ASTM/USCS) <sup>2</sup>	Predominate Grain Size < 2mm <sup>2</sup>			Predominate Color < 2 mm (Munsell 10 YR) <sup>3</sup>	Observed?	URS Archaeologist	Photo Directory	Photo File(s)
UMF-01	UTM EASTING 422651.955	UMF-01-001	SD0004	T031	24-Jun-10	12:10	422645	5391679	29.3	SW/ML	Yes	Very dark gray	Varying silt content mixed with predominate mixed sand matrix. Decomposing organic matter and woody debris.	1	No	S. McDaniel	UCR Sed 6_24_10	161-167
		UMF-01-002	SD0004	T032	24-Jun-10	12:20	422648	5391680	29.4	SW	Yes	Very dark gray		1			UCR Sed 6_24_10	168-169
	UTM NORTHING 5391668.047	UMF-01-003	SD0004	T033	24-Jun-10	12:40	422647	5391675	29.3	SW/ML	Yes	Very dark gray		1			UCR Sed 6_24_10	170-172
		UMF-01-004	SD0004	T034	24-Jun-10	12:50	422645	5391679	29.4	SW/ML	Yes	Very dark gray		1			UCR Sed 6_24_10	173-176
		UMF-01-005	SD0004	T035	24-Jun-10	13:00	422645	5391679	29.2	SW	Yes	Very dark gray		1			UCR Sed 6_24_10	177-180
		UMF-01-006	SD0004	T036	24-Jun-10	13:15	422645	5391678	29.1	SW	Yes	Very dark gray		1			UCR Sed 6_24_10	181-182
		UMF-01-007	SD0004	T037	24-Jun-10	13:45	422644	5391679	29.1	SW	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	183-184
		UMF-01-008	SD0004	T038	24-Jun-10	14:00	422643	5391678	29.2	SW	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	185-187
		UMF-01-009	SD0004	T039	24-Jun-10	14:15	422646	5391679	29.2	SW	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	188-189
		UMF-01-010	SD0004	T040	24-Jun-10	14:20	422643	5391677	29	SW	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	190-191
UMF-02	UTM EASTING 420593.484	UMF-02-001	SD0005	T041	23-Jun-10	16:05	420597	5390649	10.7	ML	Yes	Very dark grayish brown	Silt. Decomposing organic matter and limited wood debris. Few short grasses. Red leeches. Reddish-brown mottling. Faint sewage/sulfur odor.	1	No	M. Kelly	UCR Sed 6_24_10	125-128
		UMF-02-002	SD0005	T042	23-Jun-10	16:15	420588	5390654	10.6	ML	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	129-132
	UTM NORTHING 5390655.659	UMF-02-003	SD0005	T043	24-Jun-10	10:00	420588	5390653	10.5	ML	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	137-140
		UMF-02-004	SD0005	T044	24-Jun-10	10:10	420593	5390648	10.5	ML	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	142-145
		UMF-02-005	SD0005	T045	24-Jun-10	10:20	420589	5390651	10.4	ML	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	146-148
		UMF-02-006	SD0005	T046	24-Jun-10	10:30	420587	5390648	10.7	ML	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	No photo
		UMF-02-007	SD0005	T047	24-Jun-10	10:35	420588	5390645	10.3	ML	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	149-151
		UMF-02-008	SD0005	T048	24-Jun-10	10:50	420589	5390648	10.5	ML	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	152-153
		UMF-02-009	SD0005	T049	24-Jun-10	11:00	420590	5390652	10.3	ML	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	154-158
		UMF-02-010	SD0005	T050	24-Jun-10	11:10	420587	5390654	10.5	ML	Yes	Very dark grayish brown		1			UCR Sed 6_24_10	No photo
UMF-03	UTM EASTING 420027.511	UMF-03-001	SD0006	T051	24-Jun-10	15:45	420020	5392081	16.4	ML	Yes	Very dark gray	Silt. Decomposing organic matter and wood debris. Black color streaking.	1	No	S. McDaniel	UCR Sed 6_24_10	195-198
		UMF-03-002	SD0006	T052	24-Jun-10	16:00	420021	5392083	18.6	ML	Yes	Very dark gray		1			UCR Sed 6_24_10	199-200
	UTM NORTHING 5392090.602	UMF-03-003	SD0006	T053	24-Jun-10	16:05	420019	5392084	18.7	ML	Yes	Very dark gray		1			UCR Sed 6_24_10	201-203
		UMF-03-004	SD0006	T054	24-Jun-10	16:15	420018	5392084	17.9	ML	Yes	Very dark gray		1			UCR Sed 6_24_10	204-205
		UMF-03-005	SD0006	T055	24-Jun-10	16:25	420019	5392080	17.7	ML	Yes	Very dark gray		1			UCR Sed 6_24_10	205-207
		UMF-03-006	SD0006	T056	24-Jun-10	16:35	420017	5392082	18.3	ML	Yes	Very dark gray		1			UCR Sed 6_24_10	208-209
		UMF-03-007	SD0006	T057	24-Jun-10	16:35	420016	5392080	18.7	ML	Yes	Very dark gray		1			UCR Sed 6_24_10	210-211
		UMF-03-008	SD0006	T058	24-Jun-10	16:45	420018	5390280	18.1	ML	Yes	Very dark gray		1			UCR Sed 6_24_10	212-213
		UMF-03-009	SD0006	T059	24-Jun-10	16:50	420016	5392080	18.6	ML	Yes	Very dark gray		1			UCR Sed 6_24_10	214-215
		UMF-03-010	SD0006	T060	24-Jun-10	16:55	420014	5392080	18.3	ML	Yes	Very dark gray		1			UCR Sed 6_24_10	216-219

**Table Notes**

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River bottom composition and sediment texture and distribution may vary from visual observations of rejected samples
- Munsell Soil Color Charts  
NS = sample rejected based on failure to meet QAPP SOP-4 criteria  
m = meters  
mm = millimeters



**Table 3**  
**China Bend**  
**Sample Observations Summary**  
**UCR White Sturgeon Sediment Toxicity Study**

Station No.	Station Center Coordinates (NAD83) <sup>1</sup>	Sample Labeling			Grab Sample Coordinates			Sediment Characteristics			General Field Notes	Number of Grab Samples Collected	Cultural Resources		Photographic Record				
		Grab Sample Unique Identifier	Sample No.	Container Tag No.	Date Collected	Time Collected	Easting (UTM)	Northing (UTM)	Water Depth (m)	Sediment Texture (ASTM/USCS) <sup>2</sup>			Predominate Grain Size < 2mm <sup>2</sup>	Predominate Color < 2 mm (Munsell 10 YR) <sup>3</sup>	Observed?	URS Archaeologist	Photo Directory	Photo File(s)	
CB-01	UTM EASTING 431604.246	CB-01-001	SD0007	T061	25-Jun-10	13:20	431604	5407646	17 - 18	GW/SW	No	Dark grayish brown	River sediment composition difficult to define based on poor recovery. Trace amounts of sand. One boulder recovered in a sample attempt - possible cobbles and boulders. Moderate river flow and river bottom composition prevent collection of competent samples per SOP-4.	0	No	S. McDaniel	UCR Sed 6_25_2010	247-261	
		CB-01-002	SD0007	T062	NS	NS	431604	5407647	17 - 18	GW/SW	No	Dark grayish brown		0					
	UTM NORTHING 5407646.304	CB-01-003	SD0007	T063	NS	NS	431603	5407646	17 - 18	GW/SW	No	Dark grayish brown		0					
		CB-01-004	SD0007	T064	NS	NS	431605	5407647	17 - 18	GW/SW	No	Dark grayish brown		0					
			CB-01-005	SD0007	T065	NS	NS	431606	5407646	17 - 18	GW/SW	No		Dark grayish brown					0
			CB-01-006	SD0007	T066	NS	NS	431603	5407645	17 - 18	GW/SW	No		Dark grayish brown					0
			CB-01-007	SD0007	T067	NS	NS	431604	5407645	17 - 18	GW/SW	No		Dark grayish brown					0
			CB-01-008	SD0007	T068	NS	NS	431605	5407644	17 - 18	GW/SW	No		Dark grayish brown					0
			CB-01-009	SD0007	T069	NS	NS	431606	5407645	17 - 18	GW/SW	No		Dark grayish brown					0
			CB-01-010	SD0007	T070	NS	NS	431602	5407646	17 - 18	GW/SW	No		Dark grayish brown					0
CB-02	UTM EASTING 432120.704	CB-02-001	SD0008	T071	25-Jun-10	9:50	432128	5408764	16 - 17	SW/SM	Yes	Dark grayish brown	River sediment composition difficult to define based on poor recovery. Trace amounts of sand and silt recovered. Possible cobbles and boulders. Moderate river flow and river bottom composition prevent collection of competent samples per SOP-4.	0	No	S. McDaniel	UCR Sed 6_25_2010	223-246	
		CB-02-002	SD0008	T072	NS	NS	432128	5408765	16 - 17	SW/SM	Yes	Dark grayish brown		0					
	UTM NORTHING 5408773.751	CB-02-003	SD0008	T073	NS	NS	432126	5408765	16 - 17	SW/SM	Yes	Dark grayish brown		0					
		CB-02-004	SD0008	T074	NS	NS	432127	5408764	16 - 17	SW/SM	Yes	Dark grayish brown		0					
			CB-02-005	SD0008	T075	NS	NS	432129	5408764	16 - 17	SW/SM	Yes		Dark grayish brown					0
			CB-02-006	SD0008	T076	NS	NS	432129	5408763	16 - 17	SW/SM	Yes		Dark grayish brown					0
			CB-02-007	SD0008	T077	NS	NS	432128	5408762	16 - 17	SW/SM	Yes		Dark grayish brown					0
			CB-02-008	SD0008	T078	NS	NS	432126	5408763	16 - 17	SW/SM	Yes		Dark grayish brown					0
			CB-02-009	SD0008	T079	NS	NS	432127	5408762	16 - 17	SW/SM	Yes		Dark grayish brown					0
			CB-02-010	SD0008	T080	NS	NS	432130	5408762	16 - 17	SW/SM	Yes		Dark grayish brown					0
CB-03	UTM EASTING 431112.592	CB-03-001	SD0009	T081	25-Jun-10	14:10	431105	5407583	13 - 14	GW/SM	No	Dark grayish brown	River sediment composition difficult to define based on poor recovery. Trace amounts of sand and silt. Gravels and cobbles. Large wood debris. Wood debris, gravels, and cobbles prevent collection of competent samples per SOP-4.	0	No	S. McDaniel	UCR Sed 6_25_2010	264-278	
		CB-03-002	SD0009	T082	NS	NS	431105	5407584	13 -14	GW/SM	No	Dark grayish brown		0					
	UTM NORTHING 5407574.889	CB-03-003	SD0009	T083	NS	NS	431104	5407583	13 -14	GW/SM	No	Dark grayish brown		0					
		CB-03-004	SD0009	T084	NS	NS	431103	5407585	13 -14	GW/SM	No	Dark grayish brown		0					
			CB-03-005	SD0009	T085	NS	NS	431103	5407582	13 -14	GW/SM	No		Dark grayish brown					0
			CB-03-006	SD0009	T086	NS	NS	431104	5407581	13 -14	GW/SM	No		Dark grayish brown					0
			CB-03-007	SD0009	T087	NS	NS	431106	5407585	13 -14	GW/SM	No		Dark grayish brown					0
			CB-03-008	SD0009	T088	NS	NS	431107	5407583	13 -14	GW/SM	No		Dark grayish brown					0
			CB-03-009	SD0009	T089	NS	NS	431105	5407581	13 -14	GW/SM	No		Dark grayish brown					0
			CB-03-010	SD0009	T090	NS	NS	431107	5407581	13 -14	GW/SM	No		Dark grayish brown					0

**Table Notes**

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Texture classification is based on professional opinion using visual observations of recovered sediments in sampler and other field conditions  
River bottom composition and sediment texture and distribution may vary from visual observations of rejected samples
- Munsell Soil Color Charts  
NS = sample rejected based on failure to meet QAPP SOP-4 criteria  
m = meters  
mm = millimeters



**Table 4**  
**Deadmans Eddy**  
**Sample Observations Summary**  
**UCR White Sturgeon Sediment Toxicity Study**

Station No.	Station Center Coordinates (NAD83) <sup>1</sup>	Sample Labeling			Grab Sample Coordinates			Water Depth (m)	Sediment Characteristics			General Field Notes	Number of Grab Samples Collected	Cultural Resources		Photographic Record		
		Grab Sample Unique Identifier	Sample No.	Container Tag No.	Date Collected	Time Collected	Easting (UTM)		Northing (UTM)	Sediment Texture (ASTM/USCS) <sup>2</sup>	Predominate Grain Size < 2mm <sup>2</sup>			Predominate Color < 2 mm (Munsell 10 YR) <sup>3</sup>	Observed?	URS Archaeologist	Photo Directory	Photo File(s)
DME-01	UTM EASTING 446405.316	DME-01-001	SD0010	T091	26-Jun-10	11:25	446396	5420949	3.5	GW/GP	No	Variable color matrix	Cobble to boulder sized materials of mixed parent materials. Trace amounts of mixed sands. Macroinvertebrate observed in sand matrix. Moderate river flow and river bottom composition prevent collection of competent samples per SOP-4.	0	No	S. McDaniel	UCR Sed 6_26_2010	301-310
		DME-01-002	SD0010	T092	NS	NS	446396	5420951	3 - 4	GW-GP	No	Variable color matrix		0				
	UTM NORTHING 5420949.545	DME-01-003	SD0010	T093	NS	NS	446397	5420950	3 - 4	GW/GP	No	Variable color matrix		0				
		DME-01-004	SD0010	T094	NS	NS	446398	5420948	3 - 4	GW/GP	No	Variable color matrix		0				
		DME-01-005	SD0010	T095	NS	NS	446398	5420947	3 - 4	GW/GP	No	Variable color matrix		0				
		DME-01-006	SD0010	T096	NS	NS	446396	5420948	3 - 4	GW/GP	No	Variable color matrix		0				
		DME-01-007	SD0010	T097	NS	NS	446395	5420950	3 - 4	GW/GP	No	Variable color matrix		0				
		DME-01-008	SD0010	T098	NS	NS	446395	5420949	3 - 4	GW/GP	No	Variable color matrix		0				
		DME-01-009	SD0010	T099	NS	NS	446394	5420948	3 - 4	GW/GP	No	Variable color matrix		0				
		DME-01-010	SD0010	T100	NS	NS	446395	5420948	3 - 4	GW/GP	No	Variable color matrix		0				
DME-02	UTM EASTING 446795.613	DME-02-001	SD0011	T101	26-Jun-10	11:55	446803	5420440	10.5	GW/GP	No	Dark yellowish brown	Cobbles of mixed parent materials. Trace amounts of sand. Moderate river flow and river bottom composition prevent collection of competent samples per SOP-4.	0	No	S. McDaniel	UCR Sed 6_26_2010	293-298
		DME-02-002	SD0011	T102	NS	NS	446803	5420441	10 - 11	GW/GP	No	Dark yellowish brown		0				
	UTM NORTHING 5420448.714	DME-02-003	SD0011	T103	NS	NS	446802	5420441	10 - 11	GW/GP	No	Dark yellowish brown		0				
		DME-02-004	SD0011	T104	NS	NS	446802	5420440	10 - 11	GW/GP	No	Dark yellowish brown		0				
		DME-02-005	SD0011	T105	NS	NS	446804	5420440	10 - 11	GW/GP	No	Dark yellowish brown		0				
		DME-02-006	SD0011	T106	NS	NS	446805	5420439	10 - 11	GW/GP	No	Dark yellowish brown		0				
		DME-02-007	SD0011	T107	NS	NS	446804	5420439	10 - 11	GW/GP	No	Dark yellowish brown		0				
		DME-02-008	SD0011	T108	NS	NS	446804	5420438	10 - 11	GW/GP	No	Dark yellowish brown		0				
		DME-02-009	SD0011	T109	NS	NS	446802	5420439	10 - 11	GW/GP	No	Dark yellowish brown		0				
		DME-02-010	SD0011	T110	NS	NS	446801	5420439	10 - 11	GW/GP	No	Dark yellowish brown		0				
DME-03	UTM EASTING 446288.597	DME-03-001	SD0012	T111	26-Jun-10	13:25	446282	5420745	5.5	GW/GP	No	Variable color matrix	River sediment composition difficult to define based on poor recovery. Possible boulder and/or solid bedrock bottom. Moderate river flow and river bottom composition prevent collection of competent samples per SOP-4.	0	No	S. McDaniel	UCR Sed 6_26_2010	311-320
		DME-03-002	SD0012	T112	NS	NS	446283	5420745	5 - 6	GW/GP	No	Variable color matrix		0				
	UTM NORTHING 5420740.789	DME-03-003	SD0012	T113	NS	NS	446283	5420744	5 - 6	GW/GP	No	Variable color matrix		0				
		DME-03-004	SD0012	T114	NS	NS	446282	5420744	5 - 6	GW/GP	No	Variable color matrix		0				
		DME-03-005	SD0012	T115	NS	NS	446280	5420745	5 - 6	GW/GP	No	Variable color matrix		0				
		DME-03-006	SD0012	T116	NS	NS	446280	5420746	5 - 6	GW/GP	No	Variable color matrix		0				
		DME-03-007	SD0012	T117	NS	NS	446283	5420746	5 - 6	GW/GP	No	Variable color matrix		0				
		DME-03-008	SD0012	T118	NS	NS	446282	5420747	5 - 6	GW/GP	No	Variable color matrix		0				
		DME-03-009	SD0012	T119	NS	NS	446282	5420746	5 - 6	GW/GP	No	Variable color matrix		0				
		DME-03-010	SD0012	T120	NS	NS	446282	5420748	5 - 6	GW/GP	No	Variable color matrix		0				

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River bottom composition and sediment texture and distribution may vary from visual observations of rejected samples
- Munsell Soil Color Charts  
NS = sample rejected based on failure to meet QAPP SOP-4 criteria  
m = meters  
mm = millimeters



**Table 5**  
**Northport**  
**Sample Observations Summary**  
**UCR White Sturgeon Sediment Toxicity Study**

Station No.	Station Center Coordinates (NAD83) <sup>1</sup>	Sample Labeling			Grab Sample Coordinates			Water Depth (m)	Sediment Characteristics			General Field Notes	Number of Grab Samples Collected	Cultural Resources		Photographic Record				
		Grab Sample Unique Identifier	Sample No.	Container Tag No.	Date Collected	Time Collected	Easting (UTM)		Northing (UTM)	Sediment Texture (ASTM/USCS) <sup>2</sup>	Predominate Grain Size < 2mm <sup>2</sup>			Predominate Color < 2 mm (Munsell 10 YR) <sup>3</sup>	Observed?	URS Archaeologist	Photo Directory	Photo File(s)		
NP-01	UTM EASTING 443442.450	NP-01-001	SD0016	T151	27-Jun-10	11:15	443440	5419144	8 - 9	GW/SW	No	Yellowish Brown/Black	Sands with gravels, cobbles, and boulders of mixed parent materials. Moderate river flow and river bottom composition prevent collection of competent samples per SOP-4.	0	No	S. McDaniel	UCR Sed 6_24_2010	356-367		
		NP-01-002	SD0016	T152	NS	NS	443439	5419144	8 - 9	GW/SW	No	Yellowish Brown/Black		0						
	UTM NORTHING 5419135.820	NP-01-003	SD0016	T153	NS	NS	443439	5419143	8 - 9	GW/SW	No	Yellowish Brown/Black		0						
		NP-01-004	SD0016	T154	NS	NS	443440	5419142	8 - 9	GW/SW	No	Yellowish Brown/Black		0						
		NP-01-005	SD0016	T155	NS	NS	443440	5419146	8 - 9	GW/SW	No	Yellowish Brown/Black		0						
		NP-01-006	SD0016	T156	NS	NS	443441	5419145	8 - 9	GW/SW	No	Yellowish Brown/Black		0						
		NP-01-007	SD0016	T157	NS	NS	443441	5419143	8 - 9	GW/SW	No	Yellowish Brown/Black		0						
		NP-01-008	SD0016	T158	NS	NS	443441	5419142	8 - 9	GW/SW	No	Yellowish Brown/Black		0						
		NP-01-009	SD0016	T159	NS	NS	443438	5419146	8 - 9	GW/SW	No	Yellowish Brown/Black		0						
		NP-01-010	SD0016	T160	NS	NS	443442	5419144	8 - 9	GW/SW	No	Yellowish Brown/Black		0						
NP-02	UTM EASTING 444108.470	NP-02-001	SD0017	T161	27-Jun-10	08:55	444101	5419836	5 - 7	SP	No	Dark yellowish brown	River sediment composition difficult to define based on poor recovery. Trace amounts of mixed sands. Few small grasses in sand. Possible boulder and/or solid bedrock bottom. Moderate river flow and river bottom composition prevent collection of competent samples per SOP-4.	0	No	S. McDaniel	UCR Sed 6_24_2010	323-336		
		NP-02-002	SD0017	T162	NS	NS	444101	5419837	5 - 7	SP	No	Dark yellowish brown		0						
	UTM NORTHING 5419838.750	NP-02-003	SD0017	T163	NS	NS	444100	5419836	5 - 7	SP	No	Dark yellowish brown		0						
		NP-02-004	SD0017	T164	NS	NS	444099	5419836	5 - 7	SP	No	Dark yellowish brown		0						
		NP-02-005	SD0017	T165	NS	NS	444100	5419835	5 - 7	SP	No	Dark yellowish brown		0						
		NP-02-006	SD0017	T166	NS	NS	444102	5419837	5 - 7	SP	No	Dark yellowish brown		0						
		NP-02-007	SD0017	T167	NS	NS	444103	5419835	5 - 7	SP	No	Dark yellowish brown		0						
		NP-02-008	SD0017	T168	NS	NS	444102	5419835	5 - 7	SP	No	Dark yellowish brown		0						
		NP-02-009	SD0017	T169	NS	NS	444101	5419834	5 - 7	SP	No	Dark yellowish brown		0						
		NP-02-010	SD0017	T170	NS	NS	444100	5419834	5 - 7	SP	No	Dark yellowish brown		0						
NP-03	UTM EASTING 443302.500	NP-03-001	SD0018	T171	27-Jun-10	09:20	443303	5419370	5.3	GW/SP	Yes	Dark brown	Sands and gravels. Few short grasses. Woody debris. River bottom composition limits collection of competent grab sample collection.	1	No	S. McDaniel	UCR Sed 6_27_2010	337-343		
		NP-03-002	SD0018	T172	27-Jun-10	09:50	443305	5419368	5	GW/SP	Yes	Dark brown		1					UCR Sed 6_27_2010	344-347
	UTM NORTHING 5419361.440	NP-03-003	SD0018	T173	27-Jun-10	10:10	443309	5419363	5	GW/SP	Yes	Dark brown		1						
		NP-03-004	SD0018	T174	27-Jun-10	10:30	443306	5419362	5.5	GW/SP	Yes	Dark brown	Sands, gravels and boulders. Wood debris. Coarse materials prevent closure of sampler and collection of competent samples per SOP-4.	0			UCR Sed 6_24_2010	351-354		
		NP-03-005	SD0018	T175	NS	NS	443305	5419363	5 - 6	GW/SP	Yes	Dark brown		0						
		NP-03-006	SD0018	T176	NS	NS	443305	5419362	5 - 6	GW/SP	Yes	Dark brown		0						
		NP-03-007	SD0018	T177	NS	NS	443307	5419362	5 - 6	GW/SP	Yes	Dark brown		0						
		NP-03-008	SD0018	T178	NS	NS	443307	5419361	5 - 6	GW/SP	Yes	Dark brown		0						
		NP-03-009	SD0018	T179	NS	NS	443306	5419361	5 - 6	GW/SP	Yes	Dark brown		0						
		NP-03-010	SD0018	T180	NS	NS	443306	5419360	5 - 6	GW/SP	Yes	Dark brown		0						

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River bottom composition and sediment texture and distribution may vary from visual observations of rejected samples
- Munsell Soil Color Charts  
NS = sample rejected based on failure to meet QAPP SOP-4 criteria  
m = meters  
mm = millimeters



**Table 6**  
**Little Dalles**  
**Sample Observations Summary**  
**UCR White Sturgeon Sediment Toxicity Study**

Station No.	Station Center Coordinates (NAD83) <sup>1</sup>	Sample Labeling			Grab Sample Coordinates			Sediment Characteristics			General Field Notes	Number of Grab Samples Collected	Cultural Resources		Photographic Record			
		Grab Sample Unique Identifier	Sample No.	Container Tag No.	Date Collected	Time Collected	Easting (UTM)	Northing (UTM)	Water Depth (m)	Sediment Texture (ASTM/USCS) <sup>2</sup>			Predominate Grain Size < 2mm <sup>2</sup>	Predominate Color < 2 mm (Munsell 10 YR) <sup>3</sup>	Observed?	URS Archaeologist	Photo Directory	Photo File(s)
LD-01	UTM EASTING 435417.180	LD-01-001	SD0013	T121	27-Jun-10	14:35	435422	5412550	23.0	SP	Yes	Black	Poorly graded sand. Decomposing organic matter and wood debris. Small snails and shells (5 to 15 mm).	1	No	M. Stegner	UCR Sed 6_27_2010	404-408
		LD-01-002	SD0013	T122	27-Jun-10	14:45	435424	5412543	21.1	SP	Yes	Black		1			UCR Sed 6_27_2010	409-411
	UTM NORTHING 5412544.520	LD-01-003	SD0013	T123	27-Jun-10	14:50	435425	5412548	21.4	SP	Yes	Black		1			UCR Sed 6_27_2010	412-413
		LD-01-004	SD0013	T124	27-Jun-10	15:35	435434	5412545	21.0	SP	Yes	Black		1			UCR Sed 6_27_2010	414-420
	LD-01-005	SD0013	T125	27-Jun-10	15:53	435423	5412540	22.0	SP	Yes	Black	1		UCR Sed 6_27_2010			421-422	
	LD-01-006	SD0013	T126	27-Jun-10	15:59	435417	5412550	22.0	SP	Yes	Black	1		UCR Sed 6_27_2010			423-425	
	LD-01-007	SD0013	T127	27-Jun-10	16:12	435422	5412541	21.6	SP	Yes	Black	1		UCR Sed 6_27_2010			426-428	
	LD-01-008	SD0013	T128	27-Jun-10	16:45	435421	5412561	21.7	SP	Yes	Black	1		UCR Sed 6_27_2010			429-432	
	LD-01-009	SD0013	T129	27-Jun-10	16:50	435425	5412544	20.0	SP	Yes	Black	1		UCR Sed 6_27_2010			433-439	
	LD-01-010	SD0013	T130	27-Jun-10	16:57	435421	5412553	20.0	SP	Yes	Black	1		UCR Sed 6_27_2010			440-443	
LD-02	UTM EASTING 436606.680	LD-02-001	SD0014	T131	27-Jun-10	13:50	436598	5413586	22.5	GW/SW	No	Variable color matrix	Gravels and cobbles, with limited sands of mixed parent materials. Moderate river flow and river bottom composition prevent collection of competent samples per SOP-4.	0	No	M. Stegner	UCR Sed 6_27_2010	383-396
		LD-02-002	SD0014	T132	NS	NS	436597	5413587	22 - 23	GW/SW	No	Variable color matrix		0			UCR Sed 6_27_2010	383-396
	UTM NORTHING 5413599.700	LD-02-003	SD0014	T133	NS	NS	436596	5413586	22 - 23	GW/SW	No	Variable color matrix		0			UCR Sed 6_27_2010	383-396
		LD-02-004	SD0014	T134	NS	NS	436596	5413585	22 - 23	GW/SW	No	Variable color matrix		0			UCR Sed 6_27_2010	383-396
	LD-02-005	SD0014	T135	NS	NS	436598	5413585	22 - 23	GW/SW	No	Variable color matrix	0		UCR Sed 6_27_2010			383-396	
	LD-02-006	SD0014	T136	NS	NS	436598	5413584	22 - 23	GW/SW	No	Variable color matrix	0		UCR Sed 6_27_2010			383-396	
	LD-02-007	SD0014	T137	NS	NS	436598	5413587	22 - 23	GW/SW	No	Variable color matrix	0		UCR Sed 6_27_2010			383-396	
	LD-02-008	SD0014	T138	NS	NS	436599	5413586	22 - 23	GW/SW	No	Variable color matrix	0		UCR Sed 6_27_2010			383-396	
	LD-02-009	SD0014	T139	NS	NS	436599	5413585	22 - 23	GW/SW	No	Variable color matrix	0		UCR Sed 6_27_2010			383-396	
	LD-02-010	SD0014	T140	NS	NS	436599	5413584	22 - 23	GW/SW	No	Variable color matrix	0		UCR Sed 6_27_2010			383-396	
LD-03	UTM EASTING 438123.570	LD-03-001	SD0015	T141	27-Jun-10	13:00	438122	5414446	4.9	GW	No	Variable color matrix	Gravels and cobbles. Boulders observed on river bottom. No recovery of sands or silt. Moderate river flow and river bottom composition prevent collection of competent samples per SOP-4.	0	No	M. Stegner	UCR Sed 6_27_2010	373-382
		LD-03-002	SD0015	T142	NS	NS	438121	5414445	4 - 5	GW	No	Variable color matrix		0			UCR Sed 6_27_2010	373-382
	UTM NORTHING 5414445.120	LD-03-003	SD0015	T143	NS	NS	438123	5414445	4 - 5	GW	No	Variable color matrix		0			UCR Sed 6_27_2010	373-382
		LD-03-004	SD0015	T144	NS	NS	438123	5414446	4 - 5	GW	No	Variable color matrix		0			UCR Sed 6_27_2010	373-382
	LD-03-005	SD0015	T145	NS	NS	438123	5414445	4 - 5	GW	No	Variable color matrix	0		UCR Sed 6_27_2010			373-382	
	LD-03-006	SD0015	T146	NS	NS	438122	5414447	4 - 5	GW	No	Variable color matrix	0		UCR Sed 6_27_2010			373-382	
	LD-03-007	SD0015	T147	NS	NS	438120	5414446	4 - 5	GW	No	Variable color matrix	0		UCR Sed 6_27_2010			373-382	
	LD-03-008	SD0015	T148	NS	NS	438121	5414446	4 - 5	GW	No	Variable color matrix	0		UCR Sed 6_27_2010			373-382	
	LD-03-009	SD0015	T149	NS	NS	438121	5414444	4 - 5	GW	No	Variable color matrix	0		UCR Sed 6_27_2010			373-382	
	LD-30-010	SD0015	T150	NS	NS	438121	5414447	4 - 5	GW	No	Variable color matrix	0		UCR Sed 6_27_2010			373-382	

**Table Notes**

- North American Datum, 1983, Universal Transverse Mercator (UTM) Zone 11
- Please refer to Appendix C Sediment Sample Field Logs for sediment texture descriptions  
Texture classification is based on professional opinion using visual observations of recovered sediments in sampler and other field conditions  
River bottom composition and sediment texture and distribution may vary from visual observations of rejected samples
- Munsell Soil Color Charts  
NS = sample rejected based on failure to meet QAPP SOP-4 criteria  
m = meters  
mm = millimeters

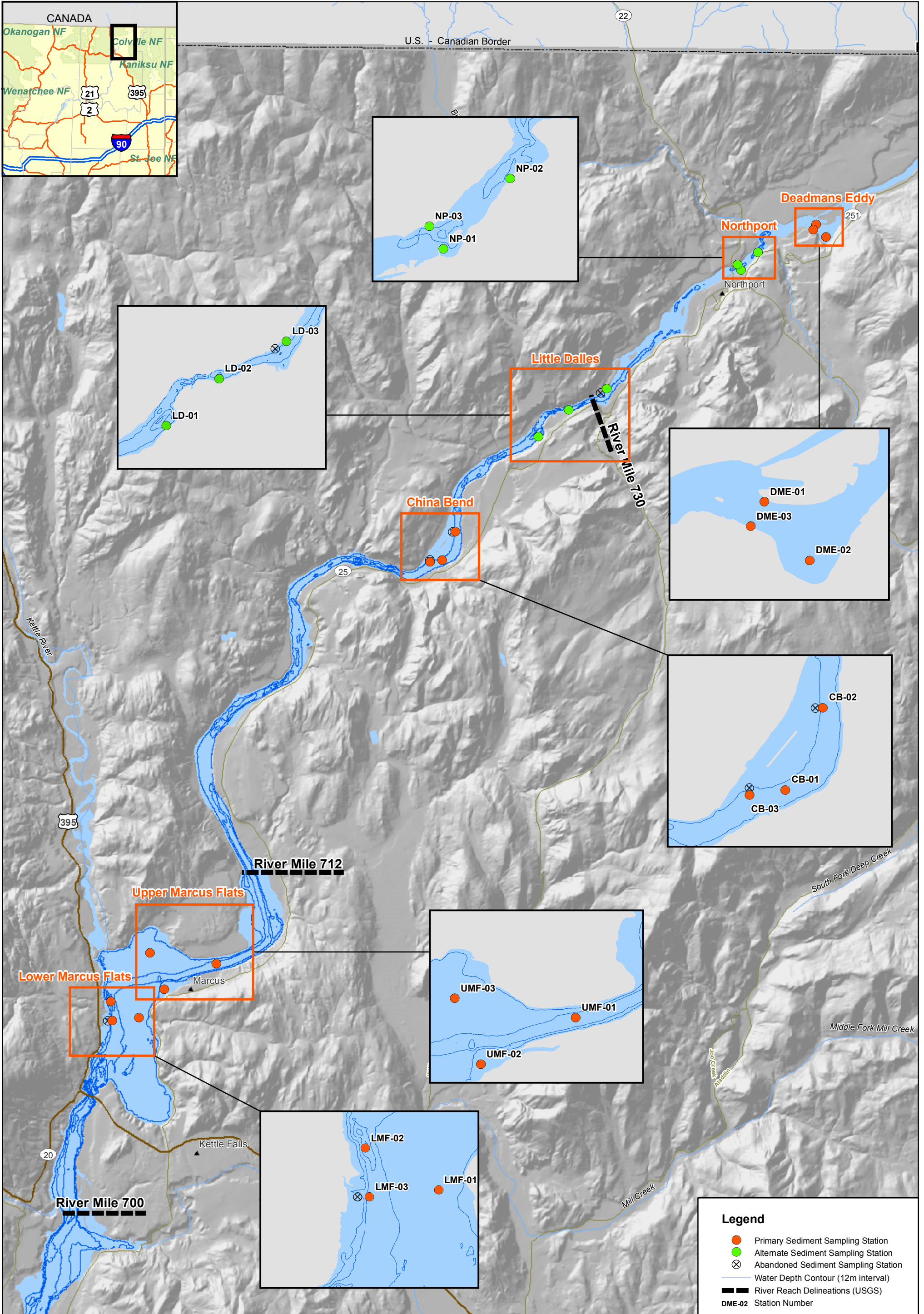




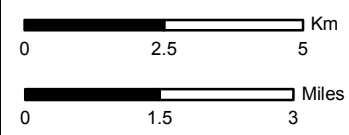
# MAPS

Field Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010





**Assessment of Sediment Toxicity to White Sturgeon**  
 June 22 to 27, 2010

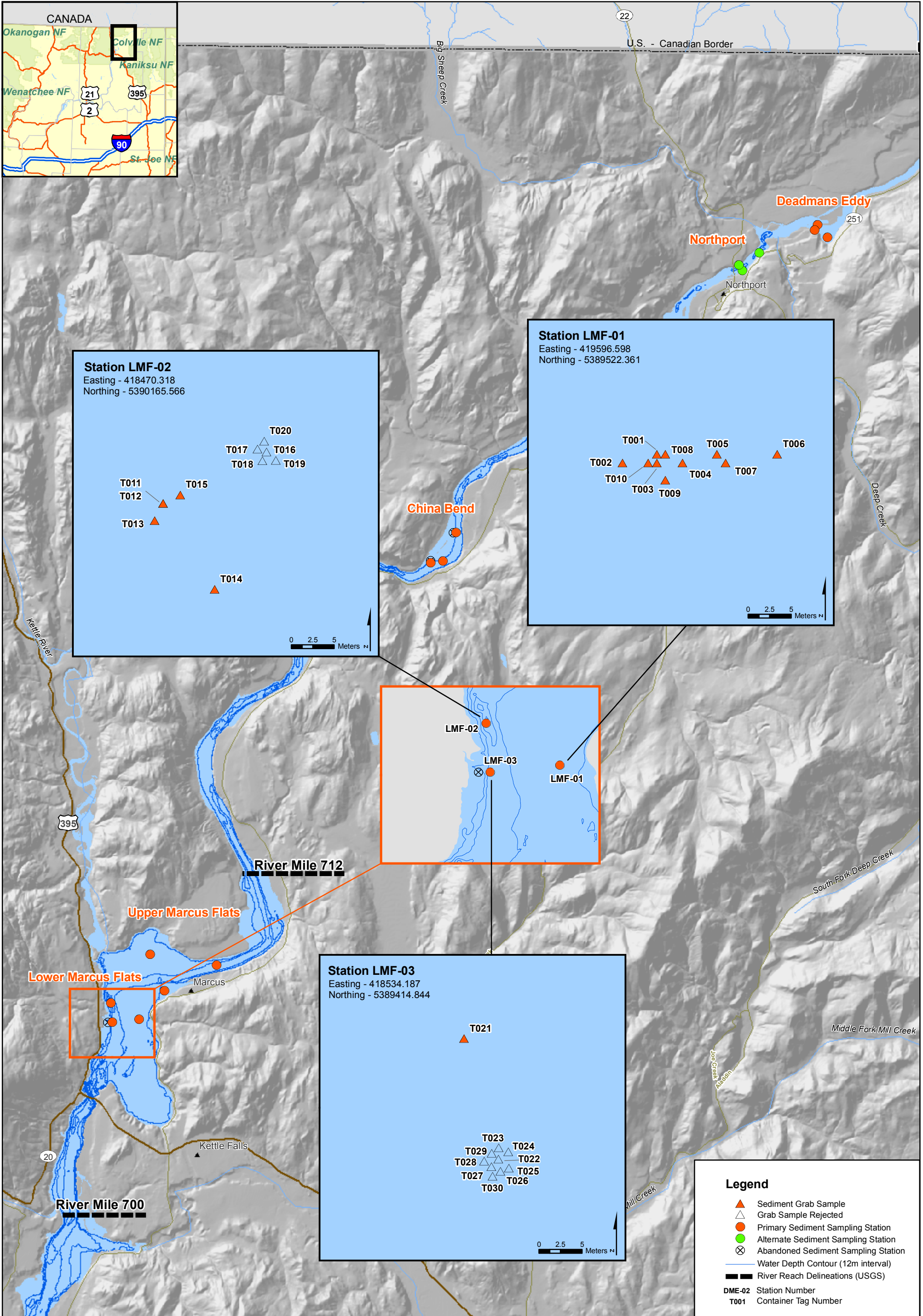


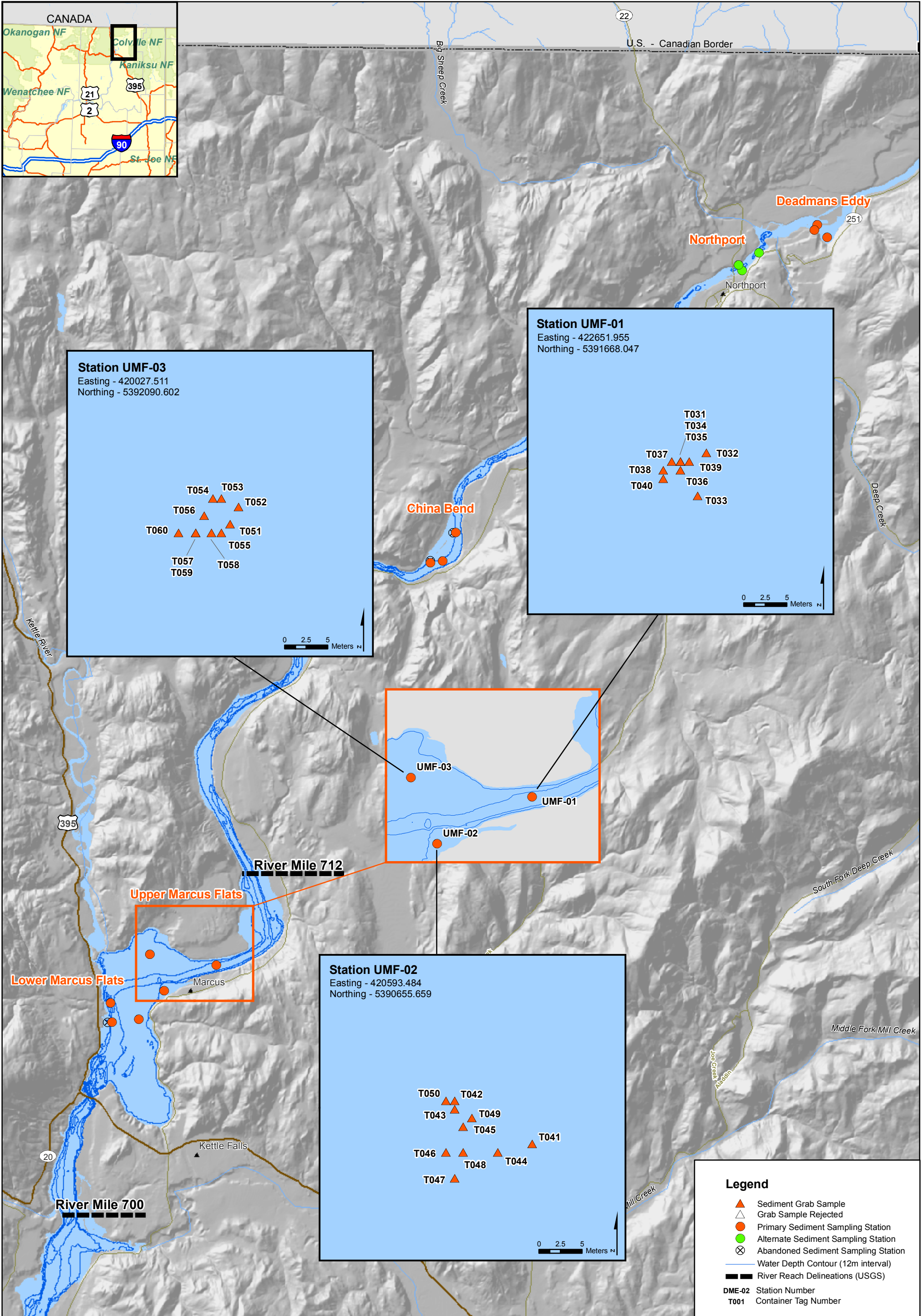
**URS Corporation**

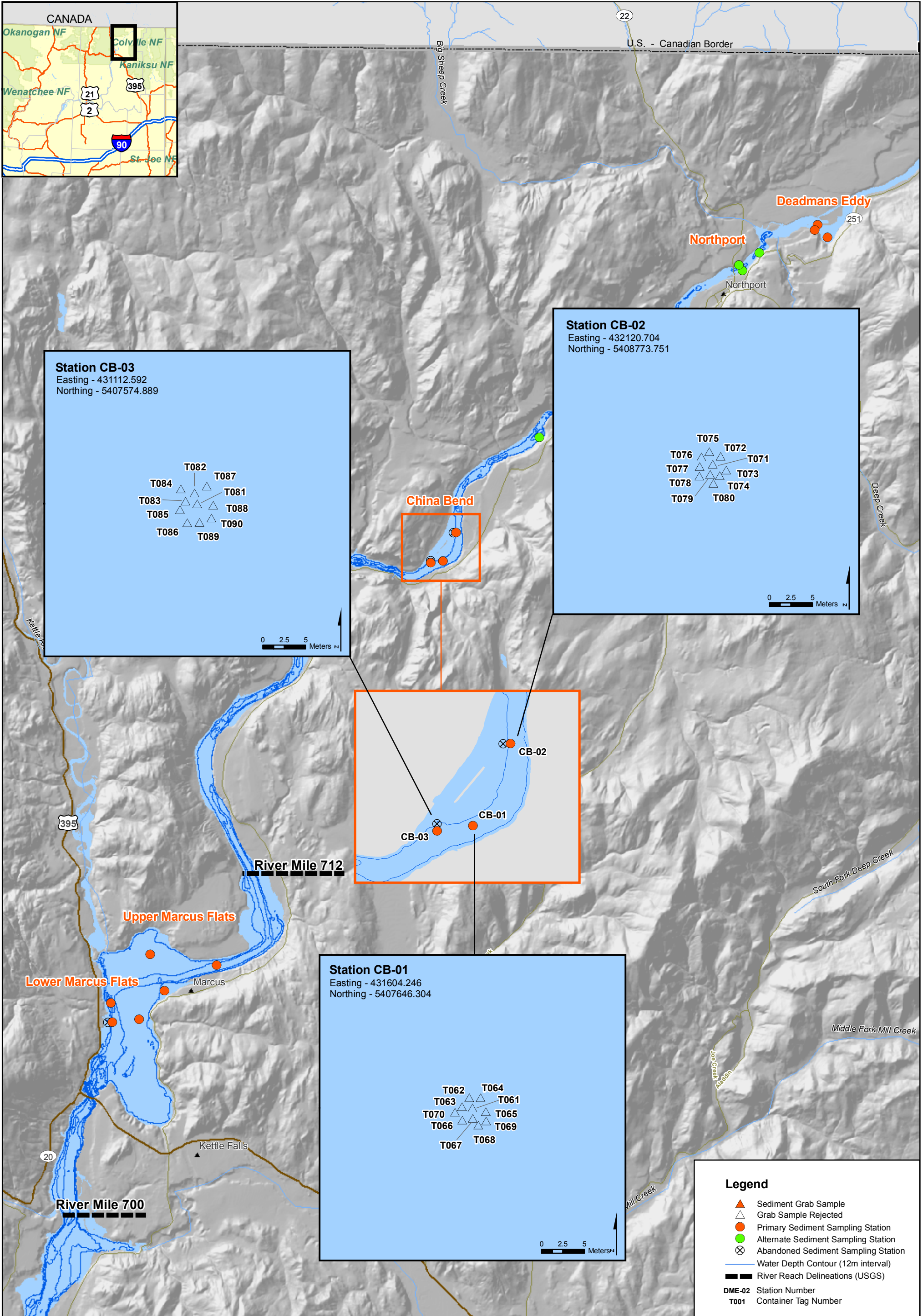
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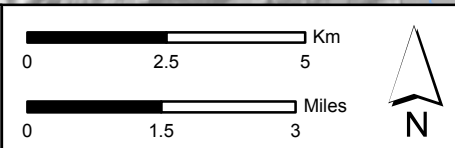
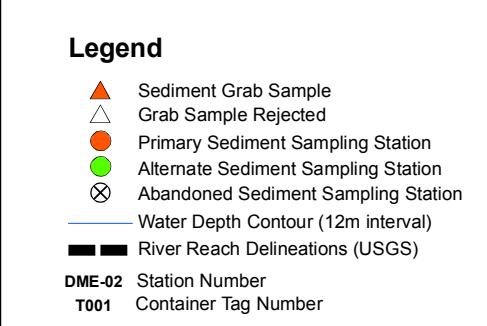
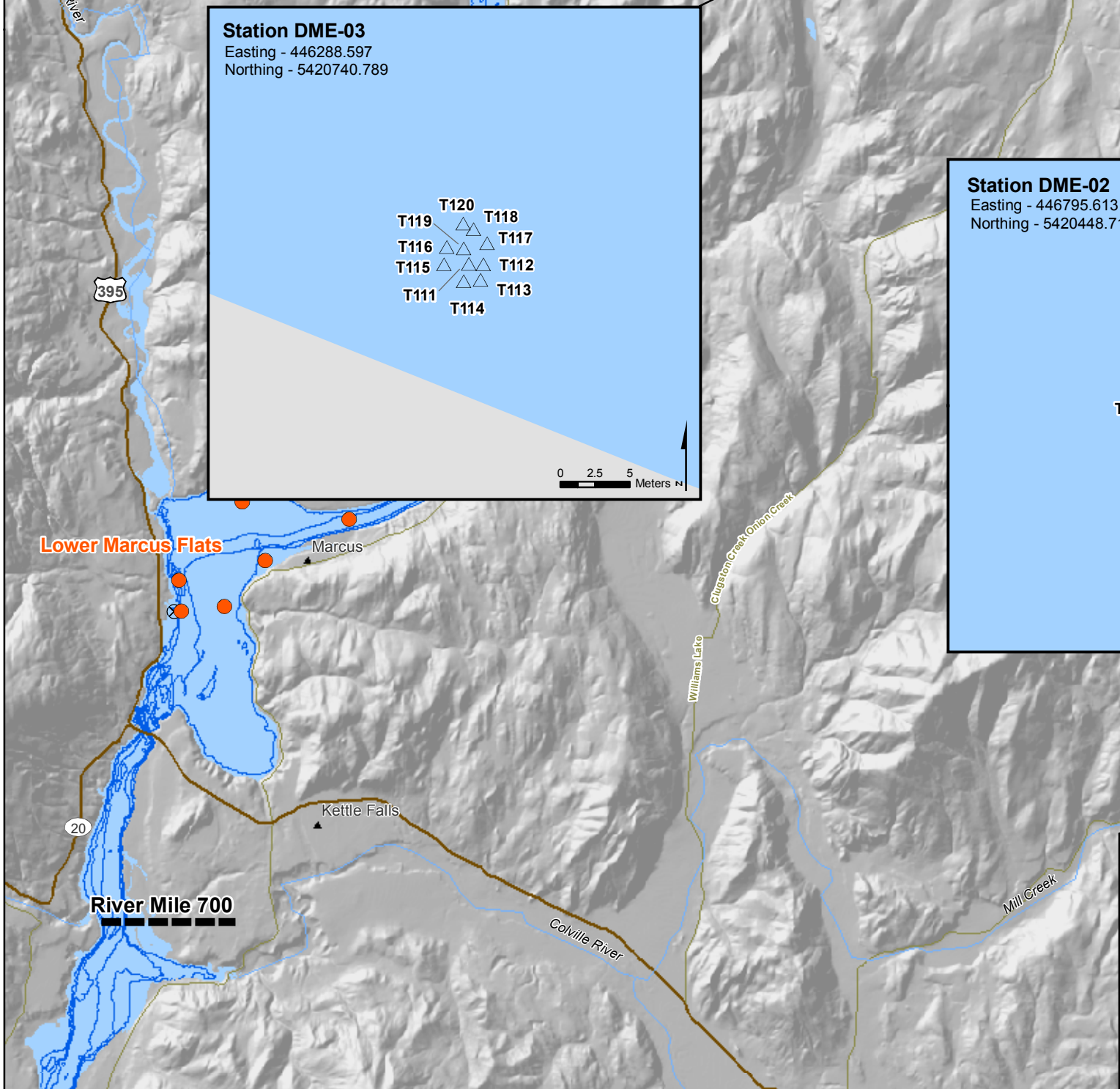
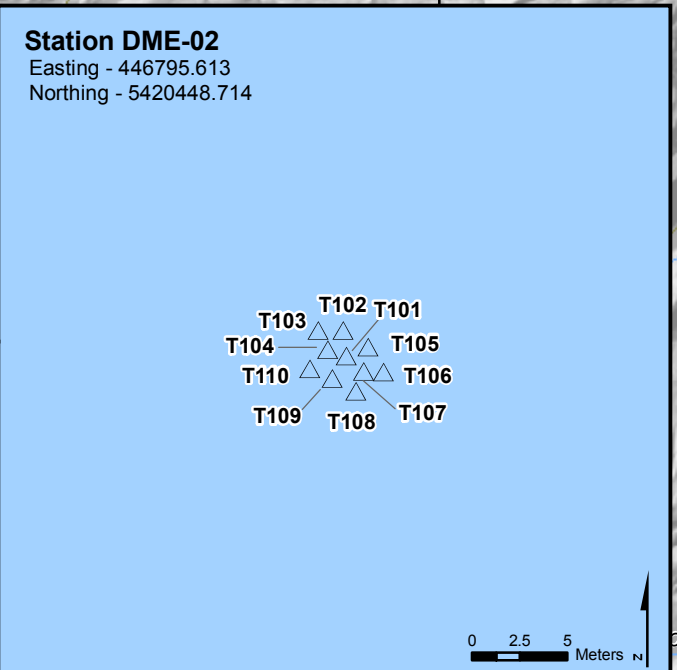
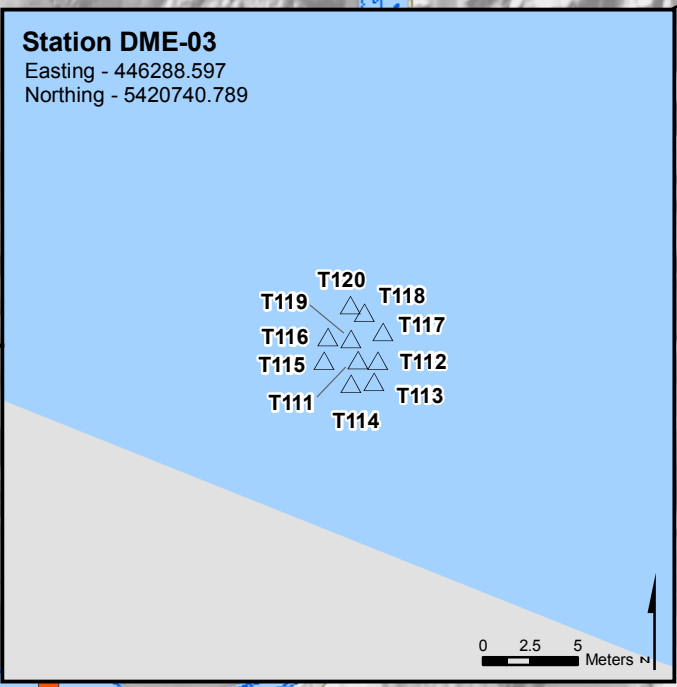
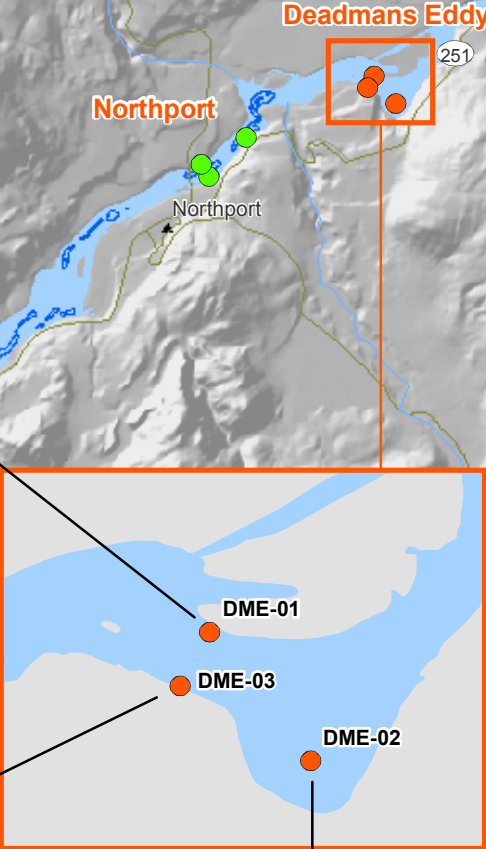
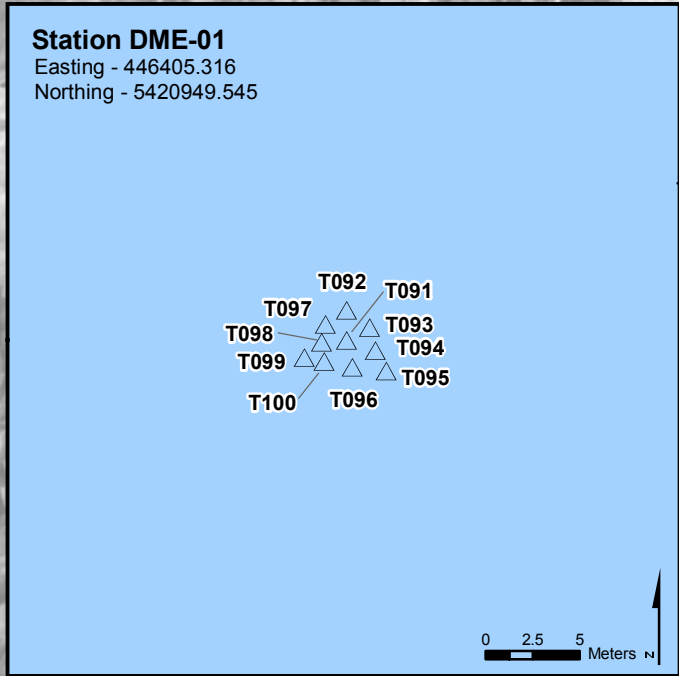
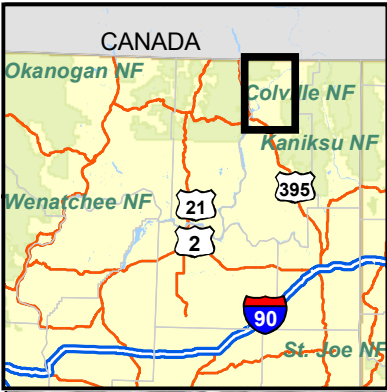
**Map 1 Primary and Alternate Sample Locations**

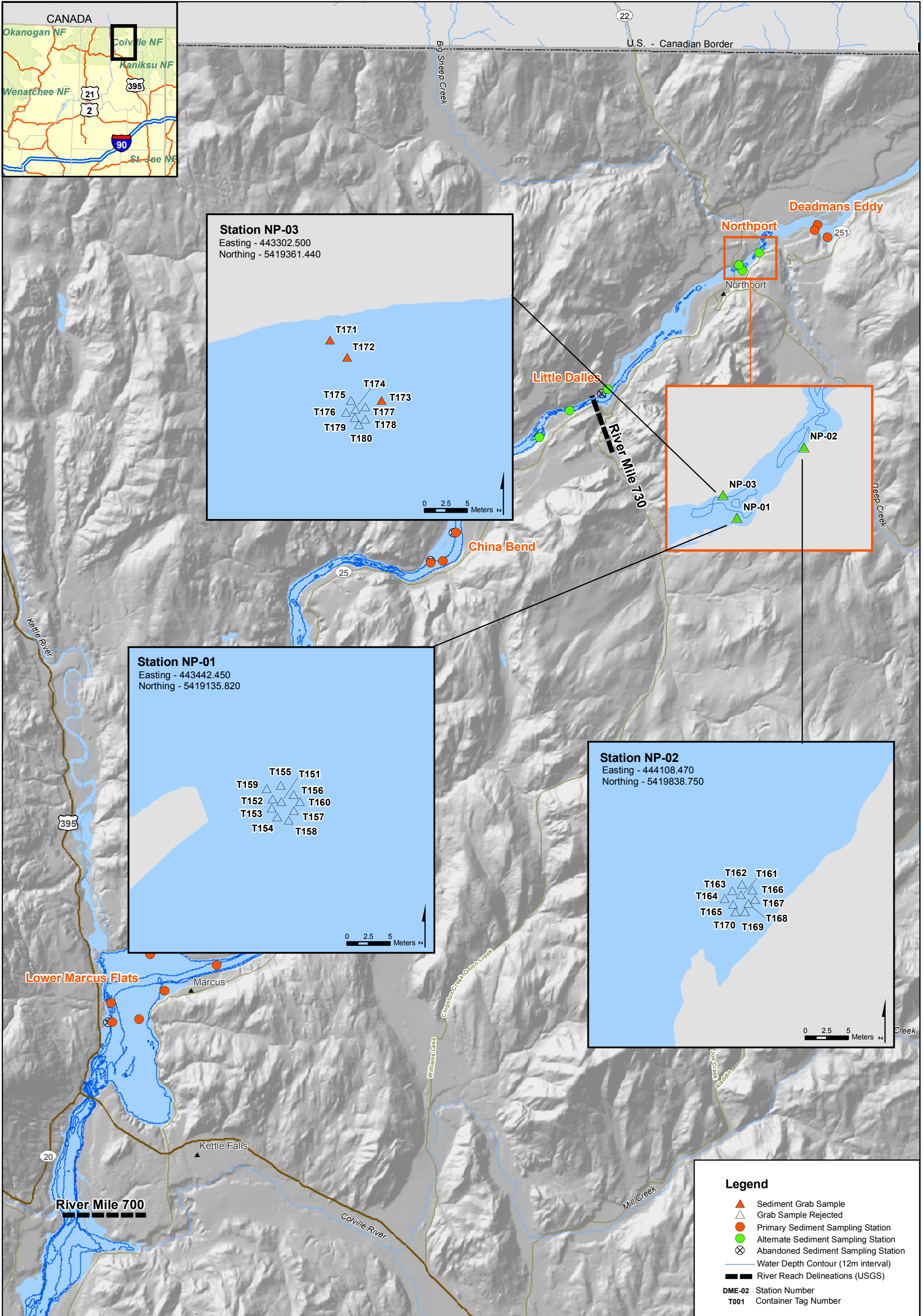
Upper Columbia River, WA











**Station NP-03**  
 Easting - 443302.500  
 Northing - 5419361.440

T171  
 T172  
 T174  
 T175 T173  
 T176 T177  
 T179 T178  
 T180

0 2.5 5 Meters

NP-02  
 NP-03  
 NP-01

0 2.5 5 Meters

**Station NP-01**  
 Easting - 443442.450  
 Northing - 5419135.820

T155 T151  
 T159 T156  
 T152 T160  
 T153 T157  
 T154 T158

0 2.5 5 Meters

**Station NP-02**  
 Easting - 444108.470  
 Northing - 5419838.750

T162 T161  
 T163 T166  
 T164 T167  
 T165 T168  
 T170 T169

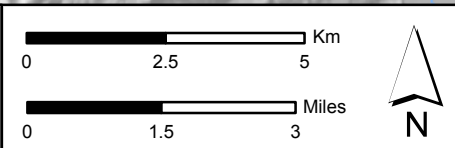
0 2.5 5 Meters

**Legend**

- ▲ Sediment Grab Sample
- △ Grab Sample Rejected
- Primary Sediment Sampling Station
- Alternate Sediment Sampling Station
- ⊗ Abandoned Sediment Sampling Station
- Water Depth Contour (12m interval)
- River Reach Delineations (USGS)

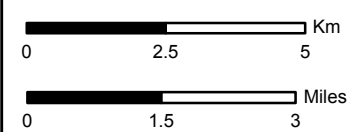
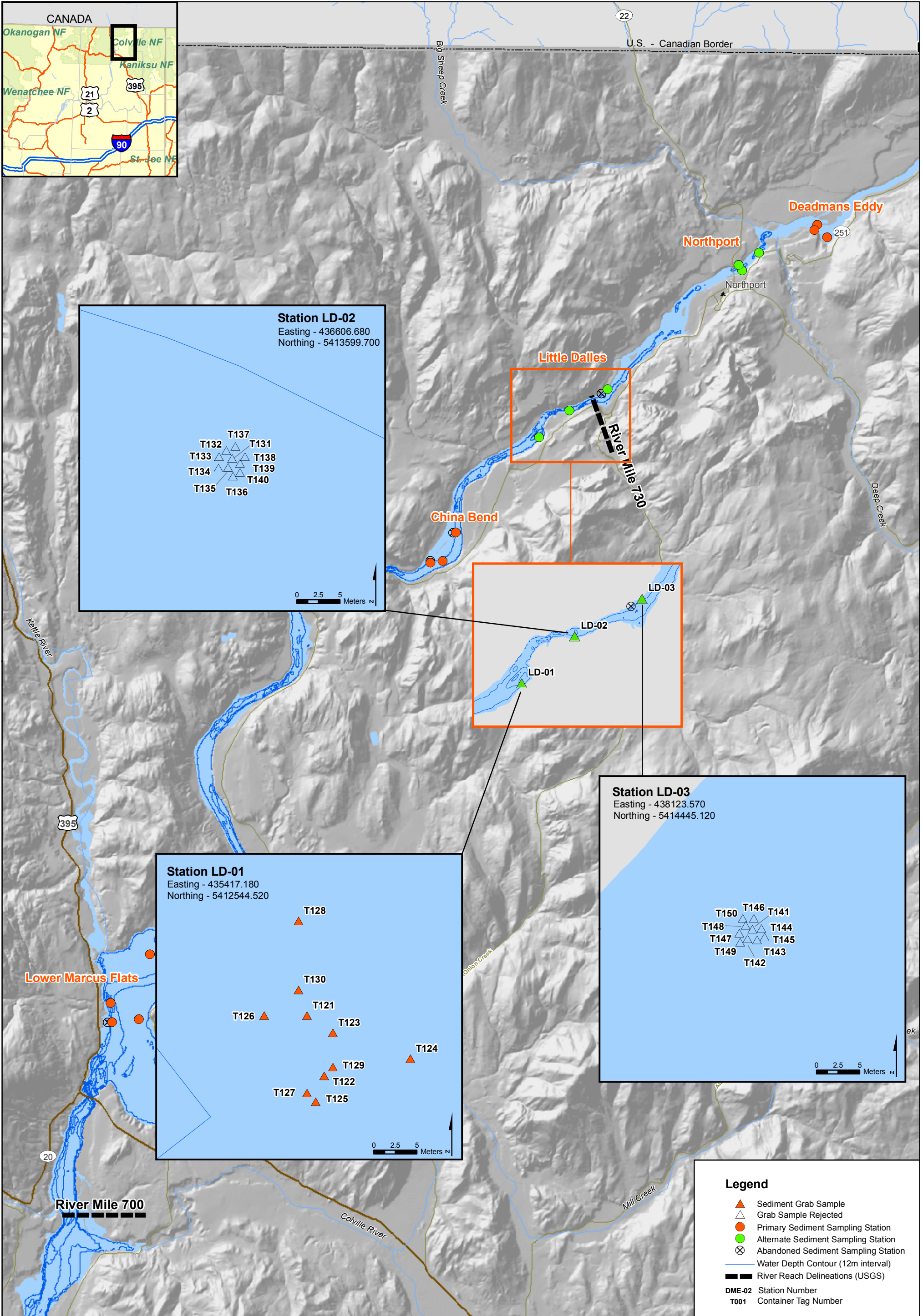
DME-02 Station Number  
 T001 Container Tag Number

**Assessment of Sediment Toxicity to White Sturgeon**  
 June 22 to 27, 2010



**URS Corporation**  
 Source:  
 GIS base layer Information  
 provided by Parametrix Inc.

**Map 6 Sediment Sample Locations - Northport**  
 Upper Columbia River, WA





APPENDIX A

**Cultural Resources Report**

Field Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010



# Upper Columbia River

## Appendix A Cultural Resources Monitoring Report Sediment Sampling Activities for the Assessment of Sediment Toxicity to White Sturgeon June 22 - 27, 2010

*Prepared for:*

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**September 2010**



URS Project #36310061

**Confidential**

To avoid vandalism, restrict information in this report about the location of archaeological sites, as provided for by Section 304 of the National Historic Preservation Act, and Washington law, RCW 27.53.070 and RCW 42.56.30

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## APPENDICES

Appendix A    Daily Field Notes

# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

Archaeological monitoring of field sediment sampling was conducted by URS Corporation (URS) under the *Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon* (QAPP, May 2010, Amended June 2010), as approved by the U.S. Environmental Protection Agency (EPA). This work was conducted as part of the Upper Columbia River (UCR or Site). Remedial Investigation and Feasibility study (RI/FS), on behalf of Teck American Incorporated (Teck). Primary objectives of the RI/FS are to investigate the nature and extent of unacceptable risk at the Site, to provide information to support baseline risk assessments for human health (to be completed by the U.S. Environmental Protection Agency [EPA]) and the environment (to be completed by Teck), and to develop and evaluate potential remedial alternatives for the Site.

The QAPP presented the approach and rationale for conducting a study to assess the toxicity of contaminants of potential concern (COPCs) associated with granulated slag from sediments in the UCR to early life stages (ELS) of white sturgeon. Data obtained during this work will be used in the baseline ecological risk assessment and overall RI/FS. Sediment toxicity to ELS of white sturgeon will be evaluated using field collected sediments from areas hypothesized as suitable white sturgeon habitat and containing a range of slag-related COPC concentrations.

The following report presents the results of archaeological monitoring of the below-water sediment sampling program conducted in June 2010, in accordance with the protocols outlined in Appendix E, Cultural Resources Coordination Plan, of the approved QAPP.

## 1.2 PROJECT LOCATION AND DESCRIPTION

The sampling program consisted of collecting below-water sediment samples from within the four primary and two alternate locations as defined by the QAPP. The primary locations were Lower Marcus Flats (LMF), Upper Marcus Flats (UMF), China Bend (CB), and Deadmans Eddy (DME). The alternate locations were Northport (NP) and Little Dalles (LD). The sample locations are between river miles (RM) 737 (DME) and 705 (LMF), generally extending from the towns of Northport to the north and Kettle Falls to the south.

Each of the four primary and two alternate locations includes three separate stations with center position Easting and Northing coordinates provided by the QAPP using the Universal Transverse Mercator (UTM) system using Zone 11 of the 1983 North American Datum (NAD83) data set. Each of the three stations within each location consisted of a 20-meter (66-foot) diameter sample area around the station center coordinate. The three stations within the six locations were assigned a suffix consisting of the sequential numbers 1 through 3 (i.e. LMF-01). Information on the primary and alternate locations and respective stations are described in Table 1 and illustrated on Map 1.

As outlined in the QAPP, 10 grab samples consisting of one 5-gallon high density polyethylene (HDPE) container each were to be collected from the 12 primary stations (3 stations at each of the 4 primary locations). Six additional stations from within the two alternate locations (NP and LD) were selected for sampling if primary station sample conditions precluded or limited competent sample collection based on criteria under QAPP Standard Operating Procedure (SOP) No. 4, Below-Water Grab Sampling Procedures. The QAPP provided for collection of 120 containers from primary stations: 12 stations with 10 grab sample containers per station, or from the alternate locations to meet the sediment volume target, if necessary.

During the 2010 sediment sampling program, a total of 59 samples were collected from primary and alternate locations. The sampling program started on June 22, 2010 and was completed on June 27, 2010.

## 2 BACKGROUND RESEARCH

### 2.1 ENVIRONMENTAL SETTING

The Site is located within the Okanogan Highlands physiographic province, which is characterized by moderately-sloped mountainous topography cut by major north-to-south oriented river valleys, including the Okanogan, Sanpoil, Columbia, Colville, and Pend Oreille rivers. Because nearly the entire province was covered by glacial ice during the Pleistocene, in some of the main valleys, glaciolacustrine sediments form a series of terraces on valley walls. The Okanogan Highlands contain a variety of parent rock material, but most abundant are granitics. Soils at lower elevations associated with margins of river valleys reflect the drier climate and transitional forest-grassland vegetation, with the most abundant parent material being glacial till. Soils found at the lowest elevations along terraces and flood plains of major rivers are formed from glacial outwash sands and gravels parent material (Franklin and Dyrness 1988:26-27). Sediments found in this valley are geologically mapped as tertiary intrusive rocks and Pleistocene continental glacial drift (Schuster 2005). Predominant vegetation type includes the *Pinus ponderosa* climax association (Franklin and Dyrness 1988:168-184).

Paleoenvironmental data which relate trends affecting the resource productivity of the region such as availability of salmon and foraging resources, suggest climatic transitions occurred throughout this region at 6500-7000 B.C., 4300-4500 B.C., 2500 B.C. and 800 B.C.-A.D. 1 (Chatters 1998). In general, the warmest and driest period of the Holocene occurred from 9000-7500 B.C., after glacial ice had mostly melted. Timberlines were elevated as much as 200 meters (656 feet) by the end of the period, and grasses and other steppe plants dominated regional flora; few forest patches existed within the Okanogan Highlands. The upper Columbia River was still eroding through glacial outwash at this time. Conditions in the Okanogan Highlands became more arid from 7500 to 4400 B.C., and grasses were replaced by sagebrush steppe, which may reflect a change from a continental to more maritime environment, characterized by warmer, wetter winters. The period between 4500 and 2500 B.C. was characterized by a cooling period and the descent of timberlines; ponderosa pine forests began to develop within the Okanogan Highlands. The coldest and wettest period of the Holocene abruptly occurred between 2500 and 2100 B.C. with further expansion of evergreen forests. Temperatures warmed after 800 B.C., and grass again replaced ponderosa pine woodland on valley floors. Due to a drought between 800 B.C. and A.D. 400, rivers aggraded to a final

Holocene floodplain; a decline in salmon productivity may have occurred. No major climatic-induced environmental changes have occurred in the past 2000 years.

## 2.2 CULTURAL SETTING-REGIONAL OVERVIEW

### 2.2.1 CULTURAL CHRONOLOGY

The Site falls near the southern boundary of the Northern Plateau culture area, which incorporates the intermountain zone of south-central British Columbia and north-central Washington (Pokotylo and Mitchell 1998). The cultural chronology that has been in widespread use for the past 30 years is based on the results of archaeological investigations along the Columbia River at the Kettle Falls area (Chance and Chance 1977, 1982, 1985). However, the Confederated Tribes of the Colville Reservation History/Archaeology Program has recently posited a new sequence which differs in that it is predicated on cultural continuity rather than ethnic repopulation, though it still relies upon archaeological sites found in the Kettle Falls vicinity (Pouley 2009).

The newly proposed temporal periods are consistent with Plateau trends and utilize names after legendary figures prominent in tribal oral traditions (Pouley 2009:82-83). Though sites dating to this period are scarce, the earliest Coyote (*sn'k'lip*) Period (8000 to 4800 years Before Present [BP]) is defined by a toolkit with a large portion of expedient tools, potential house structures, and mostly Cascade series and Mahkin Shouldered projectile points types. The procurement strategy, for which food processing and logistical organization indicate considerable planning, appears consistent with foraging activities, and is more complex than usually attributed to early assemblages (Pouley 2009:83-90).

The Salmon (*ntitiya?x*) Period (4800 to 3500 BP) corresponds to a typological shift in projectile points, the inception of tabular knives, and a presumed inception of housepits as occurred elsewhere within the Plateau culture area. Greater salmon availability, attributed to environmental changes, occurred around 3300 and 2200 BP, and the development of a collector subsistence strategy appears supportable by the relative projectile points and tabular quartzite knives patterns of use (Pouley 2009: 90-98).

The Eagle (*melqanups*) Period (3500 to 2200 BP) is characterized by an increase in tabular quartzite knife frequency and relative Plateau diagnostic point types. This period corresponds to the adoption of the collector subsistence strategy, and the presence of storage features and fire-modified rock feature frequency. An rise in the abundance of salmon is supported by the increase in tabular quartzite knives, which are thought to have functioned as salmon processing tools. Projectile point types including Mahkin Shouldered, Nespelem Bar, Rabbit Island Stemmed series, Wallula Rectangular Stemmed, Columbia Corner Notched series, and Quilomene Bar series types are represented (Pouley 2009:98-100).

The Turtle (*?ara?sikw*) Period (2200 to 200 BP) is similar to the preceding Eagle Period, but demonstrates an increase in tabular quartzite knife frequency, the inception of the bow and arrow, and a population increase. Overlapping projectile point styles include: Rabbit Island Stemmed, Columbia Corner-notched A, Quilomene Bar Corner Notched, and Quilomene Bar Basal Notched B types. Turtle Period points consist of Wallula Rectangular Stemmed, Columbia Corner Notched B,

Quilimene Bar Basal Notched A, Columbia Stemmed series and Plateau Side Notched series, the latter two representing bow and arrow technology. Fire-modified rock features are abundant (Pouley 2009:100-107).

## **2.2.2 ETHNOGRAPHIC CONTEXT**

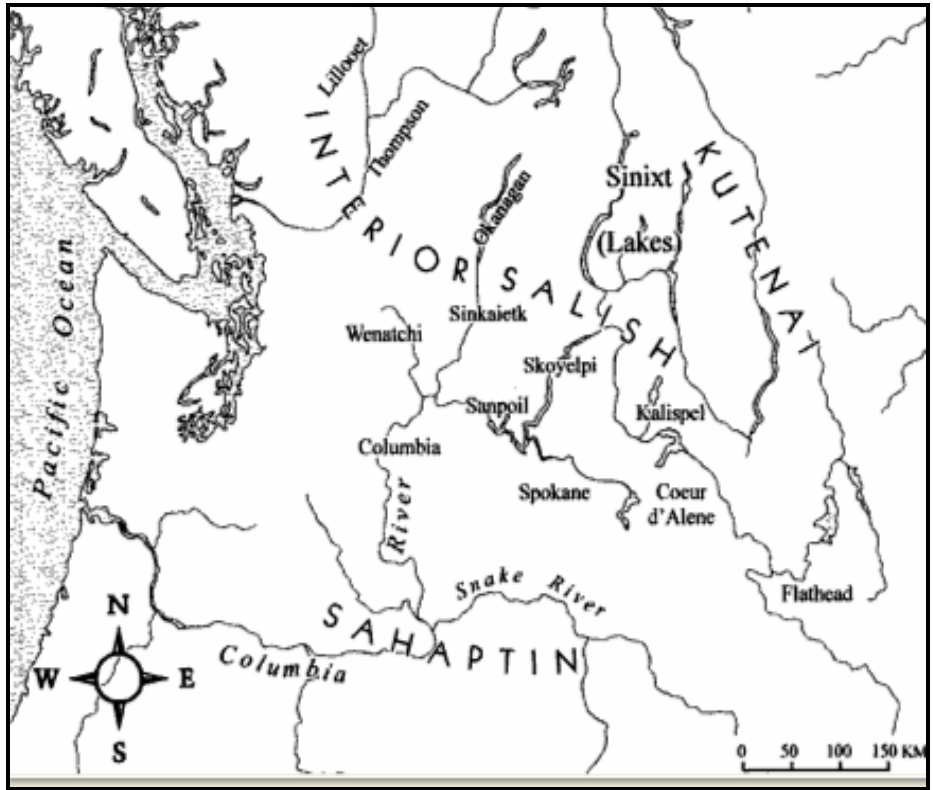
The Site and vicinity was within the traditional territory used by a variety of Interior Salish-speaking Okanagan- Colville groups, inclusive of Okanagan, Lakes, and Colville, and the Spokane Indians (Bouchard and Kennedy 1984; Kennedy and Bouchard 1998; Ross 1998). Of these groups, the Lakes and Colville proper appear to have used the area most intensively (Figure 1).

The Lakes, or Sinixt or Senijextee, were an interior Salishan-speaking people who occupied a series of interconnecting lakes and rivers surrounded by high mountain ranges, broadly from the Kettle Falls area in Washington to the lower Kootenay River in Canada, and along the Arrow Lakes region (Figure 2) (Bouchard and Kennedy 1984; Pearkes 2002; Ray 1936:115; Ruby and Brown 1992:188-189). Although often lumped with Columbia Plateau groups, the Sinixt occupied a temperate rainforest environ rather than the typical desert-like plateau area, contributing to the distinctiveness of their culture and the subsequent difficulty of ethnographers and historians to define this group as part of a culture area (Pryce 1999). The name appears to mean ‘a small speckled fish’, referring to either lake trout or Dolly Varden char (Pryce 1999:16). The Sinixt were closely related to the Colvilles and are recognized in the United States as part of the Colville Confederated Tribes, but their traditional territory was disrupted after the establishment of the Canadian boundary, which bisected their ancestral lands.

Several aspects of culture and technology of the Sinixt differ from the Colville and Northern Okanagan. The Sinixt were more mobile and relied upon the canoe for travel, and subsistence activities had a greater emphasis placed on hunting rather than fishing or plant gathering (Kennedy and Bouchard 1998:239-241). The Sinixt utilized sturgeon-nosed canoes made from the bark of white pine and constructed a variety of styles of basketry distinctive from that of other groups. Traditional housing was characterized by circular semisubterranean dwellings with radiating poles lacking a central post, with temporary conical mat lodges used during hunting and gathering activities (Kennedy and Bouchard 1998:242-243). Both conical and oblong-shaped mat lodges were common. Principal game species included deer, which were hunted individually with a flat bow or sometimes driven collectively over a cliff’s edge. Caribou, elk, moose, mountain goats and sheep, as well as a variety of smaller mammals, were hunted. Weirs were used for catching salmon on the Slocan and Kootenay rivers. Huckleberries were important and stored for winter consumption (Kennedy and Bouchard 1998:241-242).

The Colville proper, or Scheulpi/Chalpay/Skoyelpi, alternately Chaudieres or Kettles, were a Salishan people that lived at Kettle Falls on the Columbia River and south along the Columbia as far as Hunters Washington, as well as within the Colville River valley to the east (Bouchard and Kennedy 1984; Kennedy and Bouchard 1998:238-243; Ruby and Brown 1992:35-36). The name Colville is derived from a Hudson’s Bay Company governor, for whom Fort Colville was established in 1825. These people were known for their large baskets used to net salmon at Kettle Falls. Most of the Colville villages were located along major waterways, particularly the Columbia River, and subsistence was centered on fishing, though upland areas were visited for hunting, root digging, and berry picking.

The Colville Valley also appears to have been an important camas harvesting and processing location (Emerson 2004:3). Structures may have included pit houses prior to 1800 A.D., but more commonly used were conical and oblong mat lodges. Skin- and canvas-covered lodges were later utilized by the Colville after the adoption of the horse and bison hunting excursions to the Plains. The Colville population was estimated to number 1000 in 1780, 7 in 1882, and 321 in 1904 (Ruby and Brown 1992).



**Figure 1.** General ethnographic locations of the Sinixt and Colville/Skoyelpi in relation to the Site (in red). Map is from Pryce (1999:xxii).



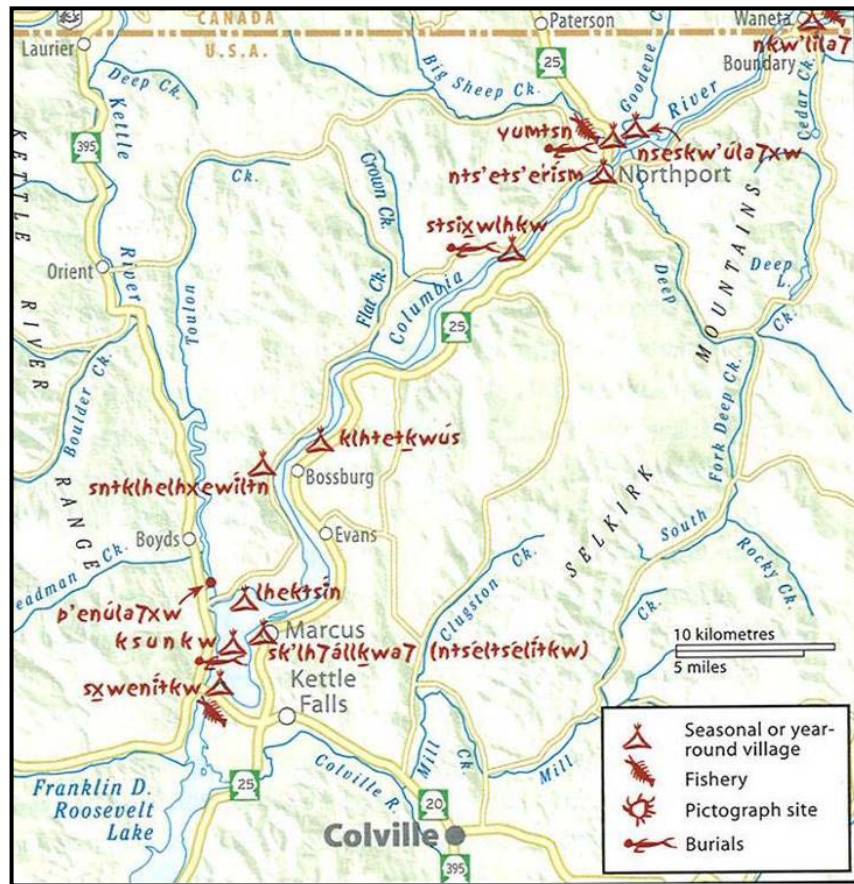


Figure 2. Major ethnographic places of the Sinixt within the UCR (from Pearkes 2002:50).

In summary, this section of the Columbia River was utilized by autonomous Lakes, Colville, Spokane, and other Salishan-speaking groups who shared hunting, fishing and root digging grounds, and thus the boundaries of territory used by these groups was fluid. The influence of fur traders, missionaries, the military and settlers disrupted aboriginal lifestyles, and resulted in major modifications to the traditional subsistence economy that was predicated on seasonal movements. The Colville Reservation was created in 1872 for upper Columbia River Salishans and relocated to the west side of the Columbia River following a second Executive Order later that same year (Kennedy and Bouchard 1998:238-243; Ruby and Brown 1992:35-36). In 1892, the North Half of the Colville Indian Reservation was ceded to the United States, resulting in its present configuration. Other federal policies including the Reservation Allotment Act of 1887, the McLaughlin Agreement of 1905, and two Presidential Proclamations in 1900 and 1916 further affected tribal lands (Confederated Tribes of Colville Reservation 2010).

Clair Hunt's Homestead Map of the North Half of the Colville Reservation (<http://content.wsulibs.wsu.edu/u/?maps.720>), dated 1900, depicts numerous Indian allotments along the west bank of the Columbia River at the UCR Site; many of these allotments correspond to ethnographic places cited in Ray (1936) and Bouchard and Kennedy (1979), further highlighting the importance of this area to ancestral and contemporary Colville and Lakes peoples.

### 2.2.3 HISTORIC CONTEXT

The Columbia River was important as a major transportation corridor, initially for the Native Americans, and later for white explorers and settlers. Permanent Euro-American settlement by fur traders in the Pacific Northwest occurred within five years of the departure of Lewis and Clark expedition of 1805-1806. The North West Company established a number of subsidiary posts throughout the interior, including the Kootenae House at the headwaters of the Columbia in 1807; the Spokane House at the mouth of the Spokane River in 1810; Fort Okanogan at the mouth of the Okanogan River in 1811; and later Fort Nez Percés at the mouth of the Walla Walla River in 1818. These efforts did much to open the interior Pacific Northwest to eventual settlement (Meinig 1968:36, 50-51, 63; Schwantes 1996:69).

The first fur trader to explore the UCR was David Thompson of the Canadian North West Company, who traveled through Kettle Falls in June 1811 (Bohn and Holstine 2006:6). Also in 1811, rival Pacific Fur Company opened Fort Spokane; after the Hudson's Bay Company (HBC) merged with the North West Company in 1821, the trading post was relocated to Kettle Falls in 1825. The area of Kettle Falls was selected because of its critical location along the Columbia River and potential for self-sufficiency given the natural farming advantage, abundance of fish, and facility of trade with the at least nine tribes who already coalesced at the falls (Bohn and Holstine 2006:6; Pankonin and McCullor 2009:45-46).

The operation was named Fort Colville after one of the governors of the HBC, and was the largest post between the Rockies and the Cascades, supplying other forts of the Upper Columbia with grain. The Indians almost exclusively provided the furs to the traders, and some began to practice agriculture as a result of this settlement. As many of the traders intermarried with local tribal women (Jackson 1996), interactions were generally peaceable until the intrusion of military units and American miners in the mid-1800s. During its 46 years of operation, Fort Colville (Figures 3 and 4) played an important role in regional history and settlement; as part of the U.S.-Canadian boundary settlement, the HBC retained Fort Colville until 1871, when it was relinquished to the United States (Bohn and Holstine 2006:7-9). Archaeological remains of Fort Colville (45ST97), now submerged beneath Lake Roosevelt, are found approximately one mile from the nearest UCR sediment sampling area at Lower Marcus Flats.

Besides the fur traders and explorers, between the 1820s and 1850s, a number of missionaries, and government officials also began to travel through the region. Protestant missionaries Elkanah Walker and Cushing Eells, with the help of Chief Big Head of the Spokane, established the first mission in Stevens County at Tshimakain, about 25 miles northwest of Spokane, in 1839 (Bohn and Holstine 2006:9; Ruby and Brown 2006:63-64). Later, as Superior of Oregon Missions, Jesuit Pierre Jean DeSmet founded a number of missions throughout the Pacific Northwest and British Columbia from 1841 to 1846. While traveling the region, at the Chaudieres, or Kettle Falls, DeSmet observed 800-900 Indians, including Colville, San Poils, and Spokanes, assembled for salmon fishing (Durham 1912:125). DeSmet created maps of his travels, noting the locations of major villages and missions, including those around Fort Colville and Kettle Falls (DeSmet 1846). The St. Paul Mission was established on the plateau overlooking the Kettle Falls in 1847 shortly following DeSmet's visit; this log structure served as a place of worship until the end of the 19<sup>th</sup> century (Bohn and Holstine 2006:11).



**Figure 3.** Indian Camp at Fort Colvile, by Paul Kane, 1847. Royal Ontario Museum.



**Figure 4.** Hudson's Bay Company Fort Colvile, 1860. United States Library of Congress. (Source: [http://fortwiki.com/Image:Colvile\\_1860\\_LOC\\_3g11420u\\_Closeup.jpg](http://fortwiki.com/Image:Colvile_1860_LOC_3g11420u_Closeup.jpg)). This area is now submerged beneath Lake Roosevelt at Marcus Flats.

The discovery of gold in 1858 led to an influx of miners and settlers to the region, including the Colville and Metaline districts. Most early efforts were centered upon extracting placer gold from sandbars and stream beds along the Columbia River and its major tributaries. Placer mining attracted many Chinese, who often worked claims abandoned by whites; names such as China Bend near Northport and China Creek near Marcus are reminiscences of these miners (Bohn and Holstine 2006:20-21).

In 1859, a “new” Fort Colville (spelled with two “l”s, perhaps an intentional American misspelling of the British spelling with one “l” [Bohn and Holstine 2006:13-14]) was founded as a military outpost, farther east of the HBC Fort Colvile, in order to protect miners in the Colville country, quell uprisings attributed to “Canadian Indians,” and provide military support for the upcoming international boundary survey (Bohn and Holstine 2006:13). Pinkney City, named for one of the fort’s commanders, developed around the military fort by 1861. The fort and Pinkney City were abandoned in the 1880s, when the modern town site of Colville, located a few miles south of the historic military site and originally inhabited by miners of the 1850s gold rush, became the county seat (Bohn and Holstine 2006:13-20; Washington Place Names 2010).

While HBC’s Fort Colvile and the U.S. Military’s Fort Colville were regional focal points of activity early on, by the later 19<sup>th</sup> century both had been abandoned, and many small towns began to emerge in response to mining booms and railroad construction. The difficulty of transportation kept Stevens County relatively isolated throughout most of the 1880s, though river boats traveled the Columbia River into British Columbia. By 1889, the Spokane Falls and Northern Railroad Company began laying rail from Spokane to the Upper Columbia River, eventually connecting to productive mines in British Columbia. Another mining boom occurred in the 1890s, especially after the North Half of the Colville Indian Reservation was opened up to white settlement. A smelter was built in Northport for use by the Le Roi Company of British Columbia, and operated as one of the largest smelters on the West Coast by 1909 (Bohn and Holstine 2006:23).

Railroad transportation also facilitated the growth of the logging and lumber industry in Stevens County. Over a hundred sawmills were operational by 1910, as lumber could then be profitably exported to eastern markets (Bohn and Holstine 2006:87). The lumber industry and agricultural pursuits, which began with the HBC’s farming operations, increased steadily throughout the late-19<sup>th</sup> and early-20<sup>th</sup> centuries, except during the Great Depression of the 1930s, during which time many homesteads and farms were abandoned. Ultimately, the U.S. Forest Service obtained much of these lands. During this era, the Civilian Conservation Corps established a number of camps in the region, built trails and lookouts, and planted trees throughout the national forests (Bohn and Holstine 2006:114-115).

Also during the Depression, construction of Grand Coulee Dam along the Columbia River was initiated as a public works project under President Roosevelt to allow for widespread irrigation of the region, as well as generation of electricity. The 1942 completion of Grand Coulee Dam caused a large lake, known as Franklin D. Roosevelt Lake, to form that extended upriver for 150 miles (240 kilometers), almost to the Canadian border, flooding Native peoples’ traditional use areas and altering salmon runs (Bouchard and Kennedy 1984). On the day the river rose over Kettle Falls, the Indians gathered on the bank and held a Ceremony of Tears to mourn the loss of the ancient fishery. The post-dam salmon run is no longer sufficient to sustain the indigenous peoples (Bohn and Holstine 2006:115-116). Although some attempts were made to address the impacts of the dam to

towns, archaeological sites and cemeteries prior to inundation (Ball 1941; Collier, Hudson, and Ford 1942), much cultural information was lost as a result of subsequent reservoir flooding (Gough 1990). Historical town sites such as “Old” Marcus and the Hudson’s Bay Company’s Fort Colville were inundated, as were countless pre-contact and historic period sites associated with traditional groups. Because of the intensive historic and pre-contact use of the area, as well as known density of archaeological resources, the potential exists for there to be cultural resources within the reservoir sediments that are the subject of the in-water UCR RI/FS sampling program.

## **2.3 CULTURAL SETTING – SAMPLE LOCATIONS**

From north to south, the UCR sample locations include: DME, NP, LD, CB, UMF, and LMF (Map 1). Each of these locations has specific associated ethnographic place-names (Bouchard and Kennedy 1979, 1984; Kennedy and Bouchard 1998; Pearkes 2002) and has been the site of unique historic developments that highlight the potential for cultural resources to be found within the below-water sample locations. The following section presents a synthesis of specific ethnographic place names, historic setting, and known archaeological sites at each of these UCR sample locations.

Regional ethnographic, historic, and archaeological references were consulted as part of this pre-field review. An archaeological records search was conducted by URS to identify any previously-recorded archaeological sites, historic resources, or cultural surveys within the Site. The May 2010 search was conducted via the online Washington State Department of Archaeology and Historic Preservation (DAHP) Washington Information System for Architectural and Archaeological Records Data (WISAARD) database. This restricted-access, searchable GIS database depicts locations of the following: 1) previously-recorded archaeological sites, 2) cultural resource surveys conducted after 1995, 3) historic register properties, and 4) cemeteries.

### **2.3.1 DEADMANS EDDY**

Ethnographic literature describes a few ethnogeographic locales in the general area of Deadmans Eddy (Map 2). For example, a small Lakes village was reportedly located about three miles upriver from Northport, which would put it in the vicinity of the DME sample stations. The sample stations may also be at or near the locale of an “aboriginal campsite,” described as being located across the river from Deadmans Eddy, that was occupied until around 1910 (Bouchard and Kennedy 1979:320; Chance 1967:77).

The origin of the name “Deadmans Eddy” has not been ascertained via common historic references (e.g., Washington Place Names 2010). Local informant Eric Weatherman, of Columbia Navigation Inc., believed the name may relate to an historic train derailment, but was uncertain as to the accuracy of this information (personal communication, May 27, 2010).

Results of the records search indicate that there are no previously-recorded archaeological resources within approximately 0.25 mile of the DME sample stations. Previously-recorded site types in the broader vicinity (e.g., 45ST89 and 45ST90) include pre-contact period resources, such as shell, bone, caches, sweatlodges, hearths, and stone tool materials, as well as historic period resources

related to mining and homesteading. In this portion of the UCR, the sites appear to be found at slightly higher elevations than, but also found eroding into, the Columbia River.

### **2.3.2 NORTHPORT**

The Northport region (Map 2) has several associated ethnogeographic placenames as well as documented archaeological locales (Bouchard and Kennedy 1979, 1984; Chance 1967; Pearkes 2002). There are reported Lakes winter villages on both sides of the river at Northport (see Figure 2), some of which were occupied year-round. Northport townsite was the location of *Nts'ets'erism*, or “having Kingfishers,” formerly home of the Lakes chief (Bouchard and Kennedy 1979:316-318).

The historic town of Northport is found along the Columbia River several miles south of the Canadian border. Early miners camped at this location for several years until the Spokane Falls and Northern Railway was completed in 1892 and a town was consequently platted by railroad magnate D.C. Corbin and the Northport Townsite Company. Incorporated in 1898, the name was selected by the railroad because of the town's northerly location along the Canadian border (Washington Place Names 2010). Prior to the arrival of the railroad, there were only three log cabins and a trail through the mountains; not even a wagon road was present, and only a dozen persons inhabited the area (Steele 1904:137-138). But by 1893, one thousand railroad workers arrived in Northport, which became important as a port-of-entry town. Though floods and fires affected the community in the 1890s, there were 1,500 residents at the time of incorporation in 1898. Miners and prospectors began populating the town after the opening of the North Half of the Colville Indian Reservation to mineral entry in February 1896. Construction of the smelter to serve the Le Roi Mines began in 1897, the town having been selected because of the readily-available lime rock. The industry employed hundreds as of the turn of the century, and Northport was known thereafter as “Smelter City.” By 1904, Northport was the most populous city of Stevens County (Steele 1904: 137-150).

Chance (1967:65-68, 71-74) recorded 10 archaeological sites in the vicinity of Northport scattered from two to three miles along both sides of the river. There are three previously-recorded archaeological sites within 0.25 mile of, but none are located within, the NP sampling area. Nearby are sites 45ST415, a pre-contact period camp with stone tools and fire-cracked rock; 45ST88, a pre-contact period site with housepits, ovens, and historic mining features; and 45ST682, an historic debris scatter found in proximity to the historic LeRoi Smelter operation.

### **2.3.3 LITTLE DALLES**

The narrow area of the Columbia River known as the Little Dalles (Map 3) was the site of *stsixwlhkw*, or “swift water,” a fishing grounds and site of one of the principal Lakes villages (Bouchard and Kennedy 1979:316; Teit 1930:210).

The name “Little Dalles” refers to the pre-dam era rapids as referred to by French-Canadian voyageurs. There was once a town established in the later 1800s at this site, which was destroyed by fire in 1881 but was renewed by the building of the Spokane Falls and Northern Railway. Its historical population was about 60 (Washington Place Names 2010).

Chance (1967:65-68, 71-74) recorded a number of archaeological sites on both sides of the river in the vicinity of the Little Dalles. The nearest documented archaeological sites are more than 0.25 mile from the LD sample stations and include 45ST69, a short-term occupation site, and 45ST76, a pre-contact camp and historic placer mining features.

### **2.3.4 CHINA BEND**

China Bend (Map 4) was the site of an Indian place-name meaning “disappears-from-sight water,” a well-known fishing ground and year-round residence for Lakes Indians who resided from the mouth of Flat Creek to Fifteenmile Creek until the early 1900s. Mythological significance is also associated with this place (Bouchard and Kennedy 1979:313-314).

China Bend was the site of considerable placer mining from the 1860s through the 1890s. The name relates to the many Chinese who washed gravel and ran sluice boxes at this locale (Washington Place Names 2010).

Three archaeological sites are found less than 0.25 mile from the CB sample stations. These include: 45ST65, a large pre-contact lithic scatter and historic homestead site; 45ST113, a pre-contact period camp with ovens and fire-cracked rock; and 45ST84, a pre-contact village with housepits and lithic materials.

### **2.3.5 UPPER AND LOWER MARCUS FLATS**

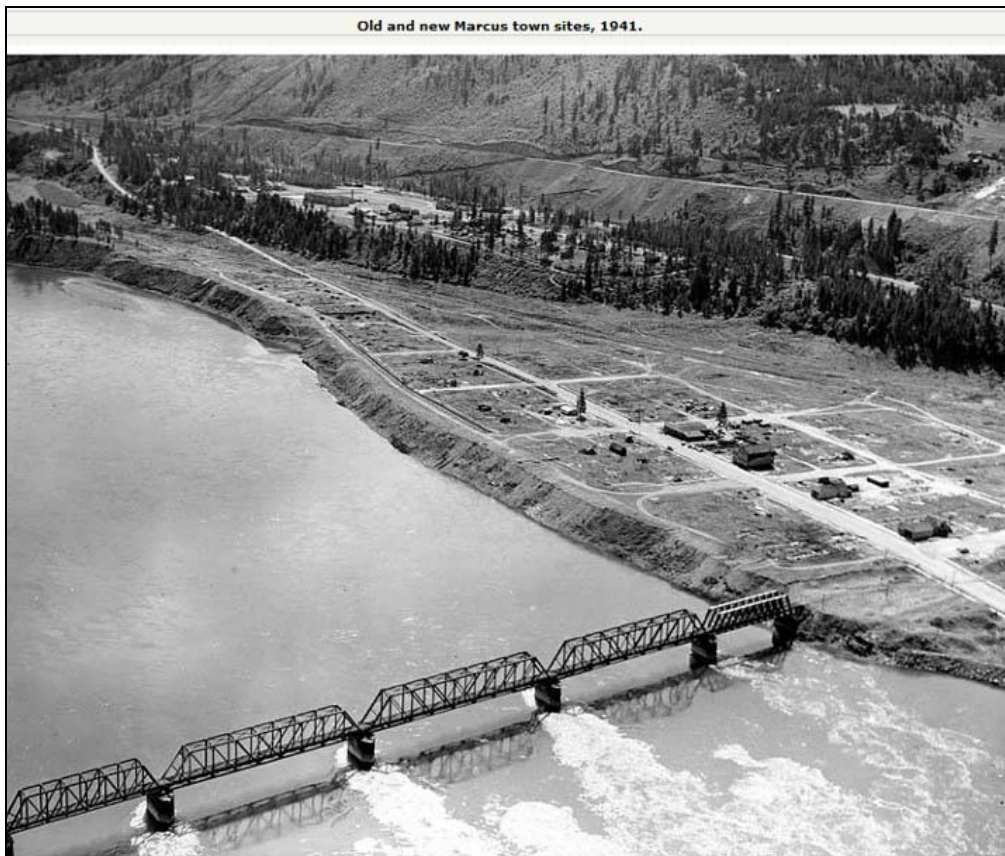
At least four ethnographic places are found within or near Upper Marcus Flats (Map 5): *sk'lh7allkwa7*, or “reach the river”, which refers to the now inundated Old Marcus Town on the east side of the Columbia, was one of the main Lakes villages; *lhektsin*, or “brushy area at edge; mouth,” an inundated site directly across from Old Marcus, was a winter village (Collier, Hudson and Ford 1942:31, 33; Chance 1970:40-43); *n7axwtula7xw*, or “inlet ground”, refers to a slough that was a good place to catch fish; and *nxwiya7lhpitkw* refers to the entire area of the Kettle River, which was occupied mostly by Lakes peoples (Bouchard and Kennedy 1979:296-301).

At least six ethnographic places are found within or near Lower Marcus Flats (Map 5) (Bouchard and Kennedy 1979:290-295), including *Snxelak*, a village around the now-inundated Marcus Flats that was the site of an encampment where foot racing, horse racing, and gambling activities took place, and *Npepkwlitskwm*, a village and popular meeting grounds for Colville, Lakes, and Kalispel groups. A rocky area of mythological importance (*sntkelu?tisxntx*), a waterfall of importance for fishing (*skwekwant*), and a former Lakes winter village (*nkwekwulhkwelh-la7xw*) are all found along the Columbia River in this area.

In 1860, the British Boundary Survey Commission built barracks at what would become known as Marcus, and used this base of operations for two years (Steele 1904:175). After its abandonment, settlers moved into the log structures and operated a store until the buildings were removed in 1881. The town of Marcus was then platted in 1890, and it developed as a base of operations for miners and as a southern terminus for steamboats until the railroad was completed through the region.

When the Grand Coulee Dam was constructed in the 1940s, the entire community of “Old” Marcus was moved to its present higher elevation location in anticipation of flooding by Franklin D. Roosevelt Lake (Steele 1904:175; Washington Place Names 2010) (Figures 5 and 6). Older structures unsuitable for moving were burned or demolished in place.<sup>1</sup>

At least eight previously-recorded archaeological resources are found within 0.25 mile of the UMF and LMF sample stations, and overall site density is high in this general area. Of these, only the Old Marcus Town Site/*Ntsiltsilitku* (45ST37) is projected to occur within the sampling area. This large site consists of the historic town of Old Marcus, with house foundations, roads, and cellars still present beneath the waters of Lake Roosevelt. A Lakes village was also located here, and artifacts including tool fragments and earth ovens have been observed even though historic disturbances have been extensive. Additional sites which are near but outside of the LMF and UMF sampling areas include: Chinese “dugouts” (45ST180), pre-contact period camps (45FE57, 45FE58, and 45ST103), and the ca. 1890s-1920s historic Williams townsite (45ST115).



**Figure 5.** Remnants of the old Marcus town site (foreground) after its removal to the new townsite (background) in anticipation of inundation by the Grand Coulee dam. This area is submerged beneath Lake Roosevelt at the UMF-02 sampling station (Source: <http://content.lib.washington.edu/u/?grandcoulee.34>).

<sup>1</sup> As depicted in the University of Washington Digital Collections Grand Coulee Dam Collection; available at <http://content.lib.washington.edu/grandcouleeweb/index.html>.





**Figure 6.** USGS Marcus quadrangle (1942) depicting the “Old” Marcus townsite, which is now submerged and comprises archaeological site 45ST37. Note the original alignment of the Columbia River in relation to the newly-flooded Franklin D. Roosevelt Lake, overlain as a hashed area as a new revision to the quadrangle at the time of its publication. (Source: <http://content.wsulibs.wsu.edu/u/?maps.446>.)

### 3 METHODS

In accordance with the protocols outlined in Appendix A, Cultural Resources Coordination Plan, of the approved QAPP, a cultural resources monitor was present throughout the duration of the below-water sediment sampling program. Teck contracted with URS to provide a professional archaeologist meeting the Secretary of Interior’s Professional Qualification Standards (as outlined in 36 CFR Part 61) to be present in the event that cultural resources were encountered during sediment removal. In addition, the National Park Service (NPS) provided cultural resources personnel when sediment sampling occurred within the jurisdiction of the Lake Roosevelt National Recreation Area. Rotating URS archaeological monitors included Michael Kelly, Sarah McDaniel, and Michelle Stegner; NPS archaeological monitors included Jim Retzer and Jonathan Riehn.

For the sampling program, Gravity Environmental LLC provided the sampling boat, Research Vessel (RV) Palouse, used for sample collection (Photograph 1). In addition, Gravity provided an additional vessel (RV Monarch) for transportation of technical observers monitoring the sampling

procedures. The NPS archaeologists were on-board the RV Palouse at all times within the Lake Roosevelt National Recreation Area, while other technical observers were on-board the RV Monarch during the course of the whole field program.

At each of the sampling stations, the RV Palouse's boat captain would maneuver to the center coordinate and/or buoy marker, and then signal the crew to lower the Power Grab Sampler (Photograph 2). Upon contact with the river bottom, the pneumatic-powered Power Grab Sampler was activated to close the clam-shell sides and collect the sediment sample. The Power Grab Sampler was then raised and maneuvered over the deck using the boom and released into Lexan tubs (Photograph 3). The monitoring archaeologist(s) visually examined each sample as it was released from the Power Grab Sampler and again when the sediment was manually transferred from the Lexan tub to the 5-gallon containers (Photograph 4). The main UCR Sediment Sampling Activities Field Report (URS 2010) to which this report is attached contains further detail regarding site positioning and specific collection methods.

Prior to sampling investigations, the monitoring archaeologist provided an overview of the protocol outlined in the Cultural Resources Coordination Plan to the field crew, boat operators, and technical observers. A pre-approved archaeological monitoring form was filled out for each sampling station (e.g. LMF-01). Copies of the monitoring forms, which substitute daily field notes, are attached as Appendix A.



**Photograph 1. RV Palouse (left), used for sampling activities, and support RV Monarch (right).**



**Photograph 2. Lowering the Power Grab Sampler into the water from the overhead boom.**



**Photograph 3. Release of sediment sample into Lexan tub**



**Photograph 4. Transferring sediment sample to decontaminated 5-gallon HDPE containers.**

## **4 RESULTS**

The Site is subject to fluctuating, dam-controlled water levels. At the time of the June 2010 sampling effort, all sample locations were within moving water areas of the Columbia River, which had maximum river flows ranging from 177,000 cubic feet per second (cfs) to 159,000 cfs. The relatively high river flow conditions created challenging boat maneuvering and sampling conditions, particularly in the narrower sections, upstream eddy flows, and reflective or side currents. The conditions required careful maneuvering by the boat captain to maintain positioning of the RV Palouse within the 20-meter (66-foot) diameter sample station.

During the 2010 sediment sampling program, which occurred from June 22 to 27, 2010, a total of 59 of the projected 120 samples were collected from primary and alternate locations. Several conditions prevented the collection of competent samples and required the rejection of samples based on QAPP criteria. Coarse materials such as gravels, cobbles, and boulders, and woody debris limited or prevented sample collection by deflecting the Power Grab Sampler or preventing closure by blocking the closing mechanism and clam-shell sides (Photograph 5). The presence of bedrock or large boulders is suspected of preventing the collection of competent samples at stations DME-03 and NP-02.

Recovered sediment was variable, and representative samples primarily included river mud or silts, sands, and cobbles (Photographs 6 - 8). Samples that did not meet the standard operating procedures

of the QAPP were rejected for sample collection; these materials were examined for evidence of cultural modification prior to being released into the river.

**No cultural resources were identified during monitoring of the below-water sediment sampling program.** Table 1 provides a summary of station information and cultural resource observations. Though several of the sample stations are found in proximity to known archaeological sites, only one sample station, UMF-02, is projected to have fallen within a site boundary, that of the Old Marcus Townsite (45ST37). No archaeological resources were observed within the sediment recovered at this sample station. Modern debris, including one fragment of cut lumber (Photograph 5) at station LMF-03, and an athletic shoe (Photograph 8) and beer can at station LD-01 were observed, but no items of historic relevance were noted.

Although no cultural resources were observed during this effort, additional monitoring would be appropriate for similar below-water sediment sampling activities due to the overall high site density and intensive historic and ethnographic use of the UCR Site prior to inundation by Lake Roosevelt.



**Photograph 5. Cut lumber and cobble in sampler at station LMF-03.**



**Photograph 6. Sample washing and poor recovery at station CB-03.**



**Photograph 7. Gravel and cobble sample at station DME-02; sample attempt rejected.**



**Photograph 8. Rejected sample attempt at station LD-01, with athletic shoe.**

## REFERENCES

Bouchard, Randy and Dorothy I.D. Kennedy

1979 Ethnogeography of the Franklin D. Roosevelt Lake Area. British Columbia Indian Language Project. Prepared for the Bureau of Reclamation, U.S. Department of the Interior.

1984 Indian Land Use and Occupancy in the Franklin D. Roosevelt Lake Area of Washington State. British Columbia Language Project. Prepared for the Colville Confederated Tribes and the United States Bureau of Reclamation.

Chance, David H.

1967 *Archaeological Survey of Coulee Dam National Recreation Area, Part 2: Spring Draw Down of 1967*. Report of Investigations No. 42. Laboratory of Anthropology, Washington State University, Pullman.

Chance, David H. and Jennifer V. Chance

1977 Kettle Falls 1976: Salvage Archaeology in Lake Roosevelt. University of Idaho Laboratory of Anthropology, Anthropological Research Manuscript Series 39. Moscow, Idaho.

1982 Kettle Falls 1971 and 1974: Salvage Archaeology in Lake Roosevelt. University of Idaho Laboratory of Anthropology, Anthropological Research Manuscript Series 69. Moscow, Idaho.

1985 Kettle Falls 1978: Fourth Archaeological Excavations in Lake Roosevelt. University of Idaho Laboratory of Anthropology, Anthropological Research Manuscript Series 84. Moscow, Idaho.

Chatters, James

1998 Environment. In *Handbook of North American Indians*, Vol. 12, Plateau, pp. 29-48. William C. Sturtevant, series editor. Smithsonian Institution, Washington, D.C.

Collier, Donald, Alfred E. Hudson, and Arlo Ford

1942 Archaeology of the Upper Columbia Region. University of Washington Publications in Anthropology, Volume 9, pp.1-178.

Confederated Tribes of the Colville Reservation

2010 History. Online reference. Available, <http://www.colvilletribes.com/proclamation.htm>. Accessed April 10, 2010.

DeSmet, Pierre Jean

1846 *Pays de Porteurs map*. Available, Early Washington Maps, Washington State University Digital Collections, <http://kaga.wsulibs.wsu.edu/u/?/maps,155>. Accessed January 5, 2010.

Durham, Nelson Wayne



1912 *History of the City of Spokane and Spokane County, Washington, From Its Earliest Settlement to the Present Time*. Volume 1. S.J. Clarke Publishing Company, Spokane, Washington.

Emerson, Stephen

2004 A Cultural Resources Survey of Stevens County's Addy-Gifford Road Improvement Project, Stevens County, Washington. Archaeological and Historical Services Short Report 829. Eastern Washington University.

Franklin, Jerry F. and C.T. Dyrness

1988 *Natural Vegetation of Oregon and Washington*. Oregon State University, Corvallis.

Galm, Jerry R., Glenn D. Hartmann, Susan Axton, and Charles T. Luttrell, Editors.

1996 *An Archaeological and Historical Sites Survey and Assessment: Grand Coulee Project area, Northern Washington*. Eastern Washington University Reports in Archaeology and History 100-94. Archaeological and Historical Services, Cheney. Report on File at the Washington Department of Archaeology and Historic Preservation, No. 1347554.

Jackson, John C.

1996 *Children of the Fur Trade: Forgotten Metis of the Pacific Northwest*. Oregon State University Press, Corvallis.

Kennedy, Dorothy I.D., and Randall T. Bouchard

1998 Northern Okanogan, Lakes, and Colville. In *Handbook of North American Indians*, Vol. 12, Plateau, pp. 238-252. William C. Sturtevant, series editor. Smithsonian Institution, Washington, D.C.

Masten, Ruth A. and Jerry R. Galm

1986 A Cultural Resources Inventory for the Grand Coulee Project: Douglas, Grant, Ferry, Lincoln, Okanogan, and Stevens Counties, Washington. Eastern Washington University Reports in Archaeology and History 100-55. Archaeological and Historical Services, Eastern Washington University, Cheney.

Meinig, D.W.

1968 *The Great Columbia Plain: A Historical Geography 1805-1910*. Seattle: University of Washington Press.

Pankonin, Lynn, and Matthew T. McCullor

2009 Ethnographic Study within the Colville River Valley, Nine Pines Ranch Wetland Restoration Project, Stevens County, Washington. Spokane Tribe of Indians Preservation Office, Wellpinit, Washington. Prepared for SWCA Environmental Consultants, Bloomfield, Colorado.

Pearkes, Eileen Delehanty

2002 *The Geography of Memory: Recovering Stories of a Landscape's First People*. Kutenai House Press, Wilaw, British Columbia, Canada.

Pokotylo, David L. and Donald Mitchell

1998 Prehistory of the Northern Plateau. In *Handbook of North American Indians*, Vol. 12, Plateau, pp. 81-102. William C. Sturtevant, series editor. Smithsonian Institution, Washington, D.C.

Pouley, John O.

2009 Kettle Falls Culture Chronology: Prehistoric Varied Land-Use, Traditions, Innovation and Adaptation Along the Upper Columbia River. Confederated Tribes of the Colville Reservation, History/Archaeology Program. Prepared for the Bonneville Power Administration and United States Bureau of Reclamation.

Pryce, Paula

1999 *Keeping the Lakes' Way: Reburial and the Re-creation of a Moral World Among an Invisible People*. University of Toronto Press Incorporated.

Ray, Verne

1936 Native Villages and Groupings of the Columbia Basin. *Pacific Northwest Quarterly* 27(2): 99-152.

Ross, John Alan

1998 Spokane. In *Handbook of North American Indians*, Vol. 12, Plateau, pp. 271-282. William C. Sturtevant, series editor. Smithsonian Institution, Washington, D.C.

Ruby, Robert H. and John A. Brown

1992 *A Guide to the Indian Tribes of the Pacific Northwest*. University of Oklahoma Press, Norman.

2006 *The Spokane Indians: Children of the Sun*. Expanded edition. Published by the University of Oklahoma Press.

Schuster, J. Eric

2005 Geologic Map of Washington State. Washington State Department of Natural Resources. Available, <http://ngmdb.usgs.gov/Info/dmt/docs/schuster07b.pdf>. Accessed April 10, 2010.

Schwantes, Carlos Arnaldo

1996 *The Pacific Northwest: An Interpretive History*. Revised and enlarged edition. University of Nebraska Press, Lincoln.

Steele, Richard F.

1904 *Illustrated History of Stevens, Ferry, Okanogan and Chelan Counties, State of Washington*. Western Historical Publishing Company. Accessed online at [http://www.sos.wa.gov/history/publications\\_view\\_pdf.aspx?i=SL\\_steeleillustrated/SL\\_steeleillustrated.pdf&p=175](http://www.sos.wa.gov/history/publications_view_pdf.aspx?i=SL_steeleillustrated/SL_steeleillustrated.pdf&p=175)



URS Corporation

2010 Upper Columbia River Draft Field Report, Sediment Sampling Activities for the Assessment of Sediment Toxicity to White Sturgeon, June 22-27, 2010. Prepared by URS Corporation, Spokane, Washington, for Teck American, Inc., Spokane, Washington. August 2010.

Washington Place Names009 Washington Placenames. Tacoma Public Library Online database. Available at: <http://search.tpl.lib.wa.us/wanames/browsewpn.asp>. Accessed April 23, 2010.

## TABLE

Cultural Resources Monitoring Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010



**TABLE 1: Summary of Sediment Sampling Locations and Cultural Resource Observations**

Location	Station	Station Center Coordinates (NAD83)		USGS Topographic Quadrangle	Average Water Depth (m)	Sediment Characteristics	Cultural Resource Observations	Cultural Monitor/ Date
		Northing	Easting					
Deadmans Eddy	DME-01	5420949.545	446405.316	Boundary	3.5	Cobble to boulder-sized materials of mixed parent materials. Trace amounts of mixed sands. Macro-invertebrate observed in sand matrix. Moderate river flow and river bottom composition prevent collection of competent samples.	No known sites at or near this sampling location. No sediment recovered for observation.	S. McDaniel (URS) 6/26/10
	DME-02	5420448.714	446795.613	Boundary	10.5	Cobbles of mixed parent materials. Trace amounts of sand. Moderate river flow and river bottom composition prevent collection of competent samples.	No known sites at or near this sampling location. No sediment recovered for observation.	S. McDaniel (URS) 6/26/10
	DME-03	5420740.789	446288.597	Boundary	5.5	River sediment composition difficult to define based on poor recovery. Possible boulder and/or solid bedrock bottom. Moderate river flow and river bottom composition prevent collection of competent samples.	No known sites at or near this sampling location. No sediment recovered for observation.	S. McDaniel (URS) 6/26/10
Northport	NP-01	5419135.820	443442.450	Northport	8.5	Sands with gravels, cobble, and boulders of mixed parent materials. Moderate river flow and river bottom composition prevent collection of competent samples.	Historic and pre-contact sites are nearby but little sediment was recovered for observation at this location.	S. McDaniel (URS) 6/27/10
	NP-02	5419838.750	444108.470	Northport	6	River sediment composition difficult to define based on poor recovery. Trace amounts of mixed sands. Few small grasses in sand. Possible boulder and/or solid bedrock bottom. Moderate river flow and river bottom composition prevent collection of competent samples.	Historic and pre-contact sites are nearby but little sediment was recovered for observation at this location.	S. McDaniel (URS) 6/27/10
	NP-03	5419361.440	443302.500	Northport	5.5	Sands, gravels, and boulders. Wood debris. Coarse materials prevent closure of sampler and collection of competent samples.	No sites at or near this location. No observed resources, but little sediment was recovered for observation.	S. McDaniel (URS) 6/27/10

**TABLE 1: Summary of Sediment Sampling Locations and Cultural Resource Observations**

Location	Station	Station Center Coordinates (NAD83)		USGS Topographic Quadrangle	Average Water Depth (m)	Sediment Characteristics	Cultural Resource Observations	Cultural Monitor/ Date
		Northing	Easting					
Little Dalles	LD-01	5412544.520	435417.180	China Bend	21	Poorly graded sand. Decomposing organic matter and wood debris. Small snails and shells (5 to 15 mm).	No sites at or near this location. Modern athletic shoe and beer can recovered.	M. Stegner (URS); J. Riehn (NPS); 6/27/10
	LD-02	5413599.700	436606.680	Onion Creek	22.5	Gravels and cobbles, with limited sands of mixed parent materials. Moderate river flow and river bottom composition prevent collection of competent samples.	No sites at or near this location. No sediment recovered for observation.	M. Stegner (URS); J. Riehn (NPS); 6/27/10
	LD-03	5414445.120	438123.570	Northport	4.5	Gravels and cobbles. Boulders observed on river bottom. No recovery of sands or silt. Moderate river flow and river bottom composition prevent collection of competent samples.	No sites at or near this location. No sediment recovered for observation.	M. Stegner (URS); J. Riehn (NPS); 6/27/10
China Bend	CB-01	5407646.304	431604.246	China Bend	17.5	River sediment composition difficult to define base on poor recovery. Trace amounts of sand. One boulder recovered in a sample attempt – possible cobbles and boulders. Moderate river flow and river bottom composition prevent collection of competent samples.	Near boundary of pre-contact and historic period site. No sediment was recovered for observation.	S. McDaniel (URS); J. Riehn (NPS); 6/25/10
	CB-02	5408773.751	43210.704	China Bend	16.5	River sediment composition difficult to define based on poor recovery. Trace amounts of sand and silt recovered. Possible cobbles and boulders. Moderate river flow and river bottom composition prevent collection of competent samples.	Near boundary of pre-contact and historic period site. No sediment was recovered for observation.	S. McDaniel (URS); J. Riehn (NPS); 6/25/10
	CB-03	5407574.889	431112.592	China Bend	13.5	River sediment composition difficult to define based on poor recovery. Trace amounts of sand and silt. Gravels and cobbles. Large wood debris. Wood debris, gravels, and cobbles prevent collection competent samples.	Near boundary of pre-contact and historic period site. No sediment was recovered for observation.	S. McDaniel (URS); J. Riehn (NPS); 6/25/10

**TABLE 1: Summary of Sediment Sampling Locations and Cultural Resource Observations**

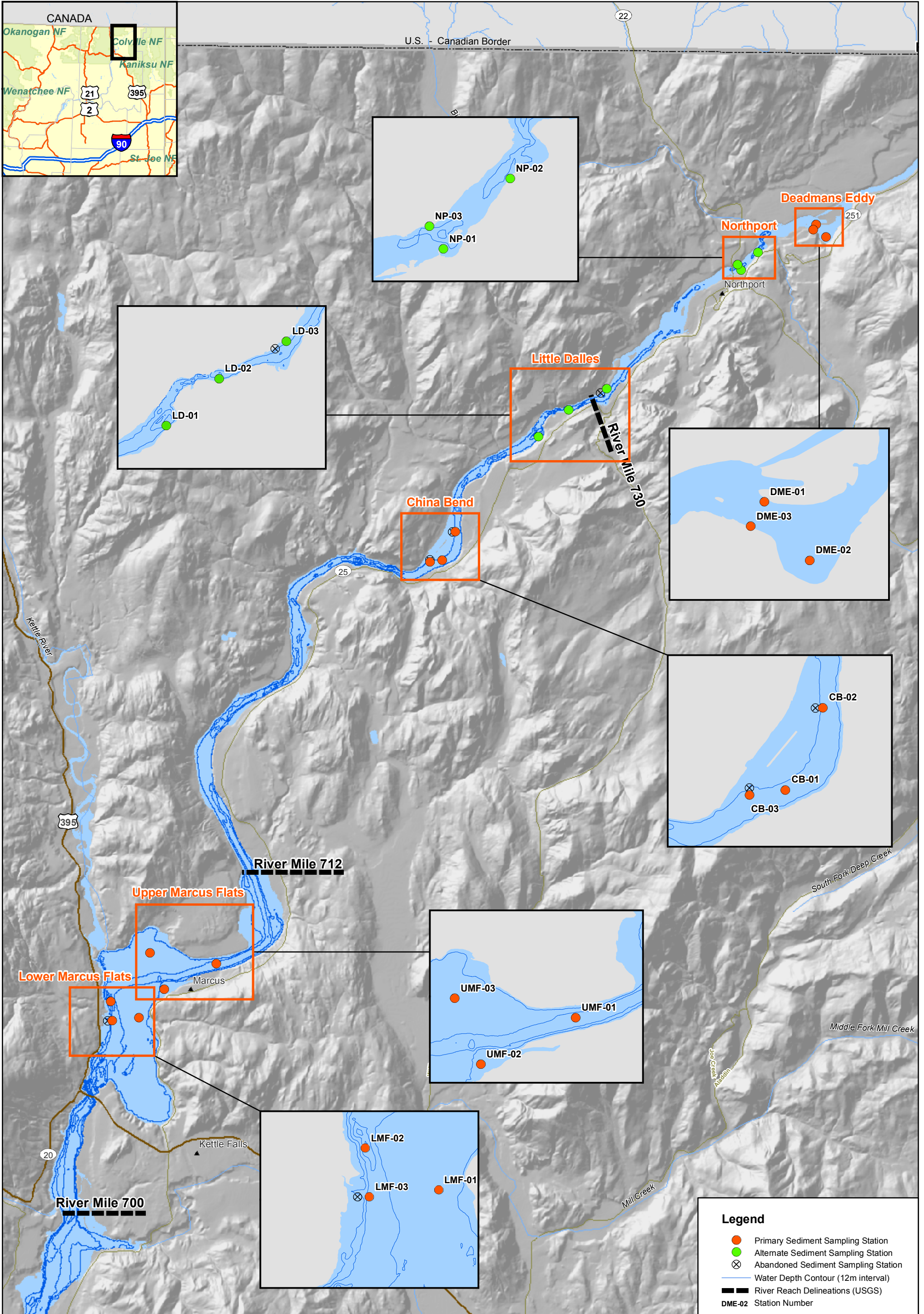
Location	Station	Station Center Coordinates (NAD83)		USGS Topographic Quadrangle	Average Water Depth (m)	Sediment Characteristics	Cultural Resource Observations	Cultural Monitor/ Date
		Northing	Easting					
Upper Marcus Flats	UMF-01	5391668.047	422651.955	Marcus	29	Varying silt content mixed with predominate mixed sand matrix. Decomposing organic matter and woody debris.	Near Old Marcus townsite (45ST37) and Marcus Island. No cultural materials observed in recovered materials.	S. McDaniel (URS); J. Riehn (NPS); 6/24/10
	UMF-02	5390655.659	420593.484	Marcus	10.5	Silt. Decomposing organic matter and limited wood debris. Few short grasses. Red leeches. Reddish-brown mottling.	Within Old Marcus Townsite/ <i>Ntsiltsilitku</i> (45ST37). No cultural materials observed within samples.	M. Kelly (URS); J. Retzer (NPS); 6/23/10. S. McDaniel (URS); J. Riehn (NPS); 6/24/10
	UMF-03	5392090.602	420027.511	Marcus	18	Silt. Decomposing organic matter and wood debris. Black color streaking.	Near but outside site boundary of pre-contact camp. No cultural materials observed within samples.	S. McDaniel (URS); J. Riehn (NPS); 6/24/10
Lower Marcus Flats	LMF-01	5389522.361	419596.598	Marcus	19	Silt. Decomposing organic matter. Black and yellowish brown streaking.	No sites at or near sampling location. No cultural materials observed within samples.	M. Kelly (URS); J. Retzer (NPS); 6/22/10
	LMF-02	5390165.566	418470.318	Marcus	43	Varying silt content mixed with black sands. Decomposing matter and wood debris of varying type and size. Red leeches. Poor recovery.	No sites at or near sampling location. Dense woody debris on river floor; area within an area used to store log rafts for 50+ years related to old lumber mill nearby.	M. Kelly (URS); J. Retzer (NPS); 6/23/10
	LMF-03	5389414.844	418534.187	Marcus	28	Sand, gravels, and cobbles, with few silts/fines. Wood debris, gravels, and cobbles block sampler and prevent collection of competent samples.	Several sites are found nearby but above drop-off into channel. One fragment of cut lumber recovered from grab sampler, probably modern.	M. Kelly (URS); J. Retzer (NPS); 6/22/10

# MAPS

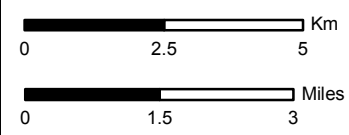
Cultural Resources Monitoring Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010







**Assessment of Sediment Toxicity to White Sturgeon**  
 June 22 to 27, 2010

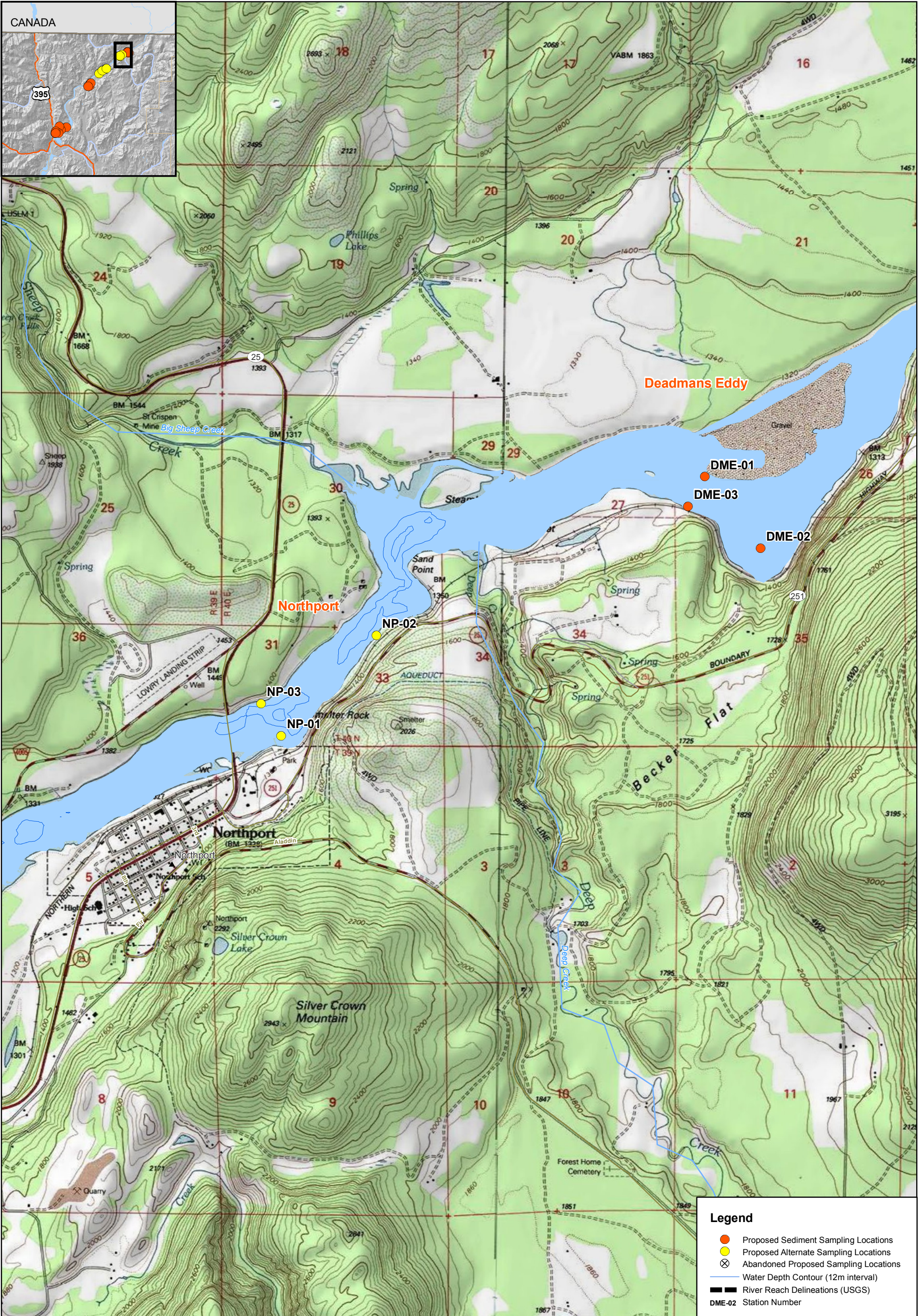
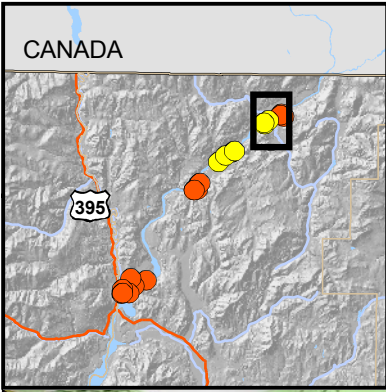


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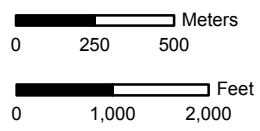
Source:  
 GIS base layer Information  
 provided by Parametrix Inc.

**Map 1 Primary and Alternate Sample Locations**

Upper Columbia River, WA



**Assessment of Sediment Toxicity to White Sturgeon**  
**June 22 to 27, 2010**

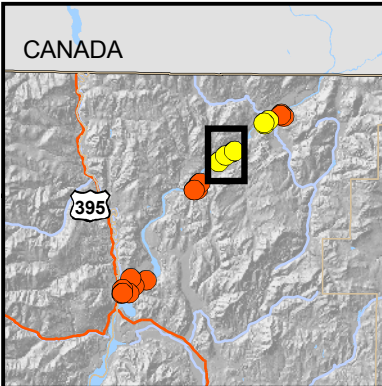
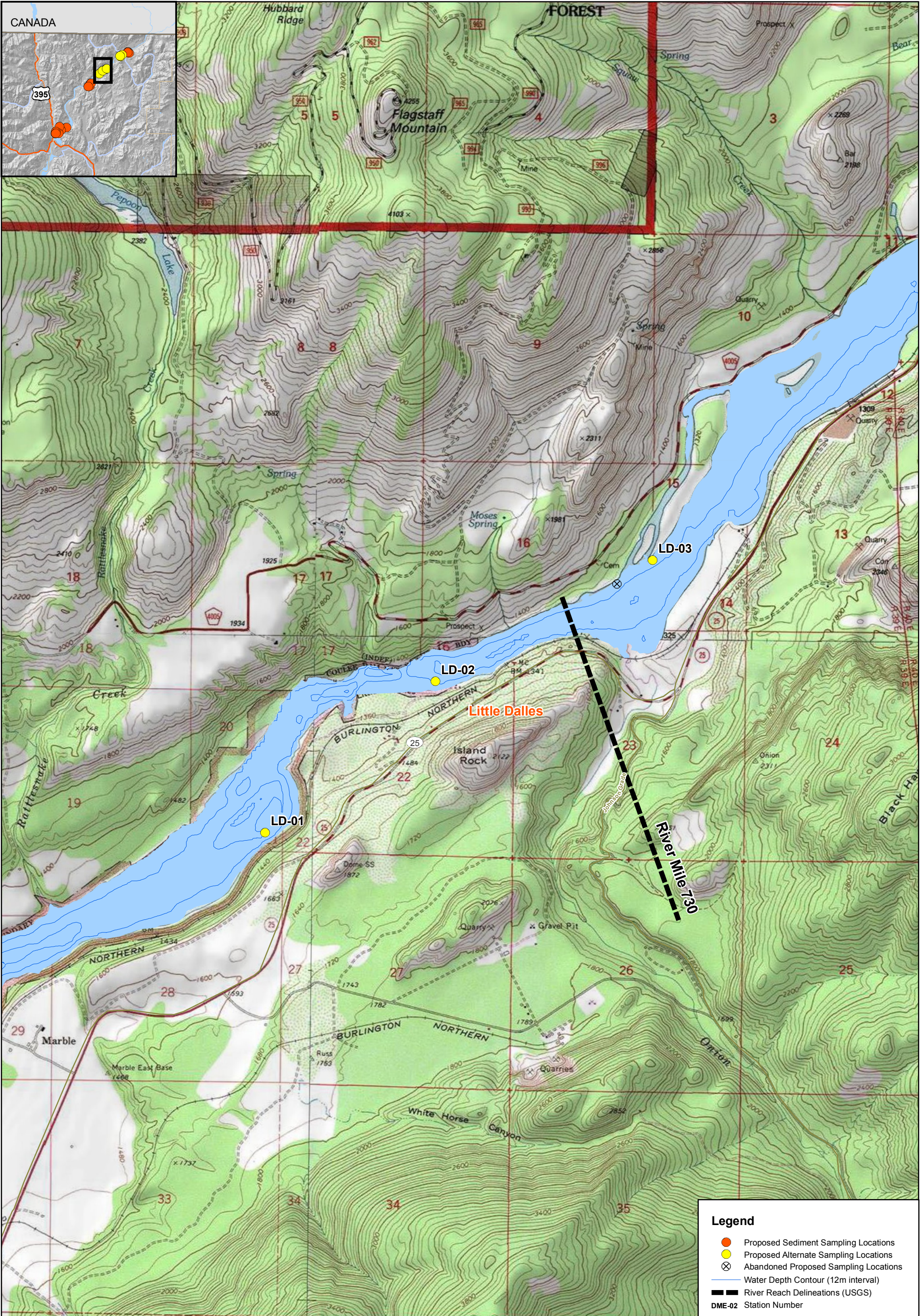


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Source:  
 GIS base layer Information  
 provided by Parametrix Inc.

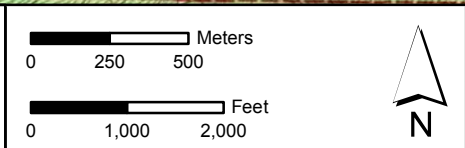
**Map 2 Primary and Alternate Sample Locations - Northport and Deadmans Eddy**

Upper Columbia River, WA



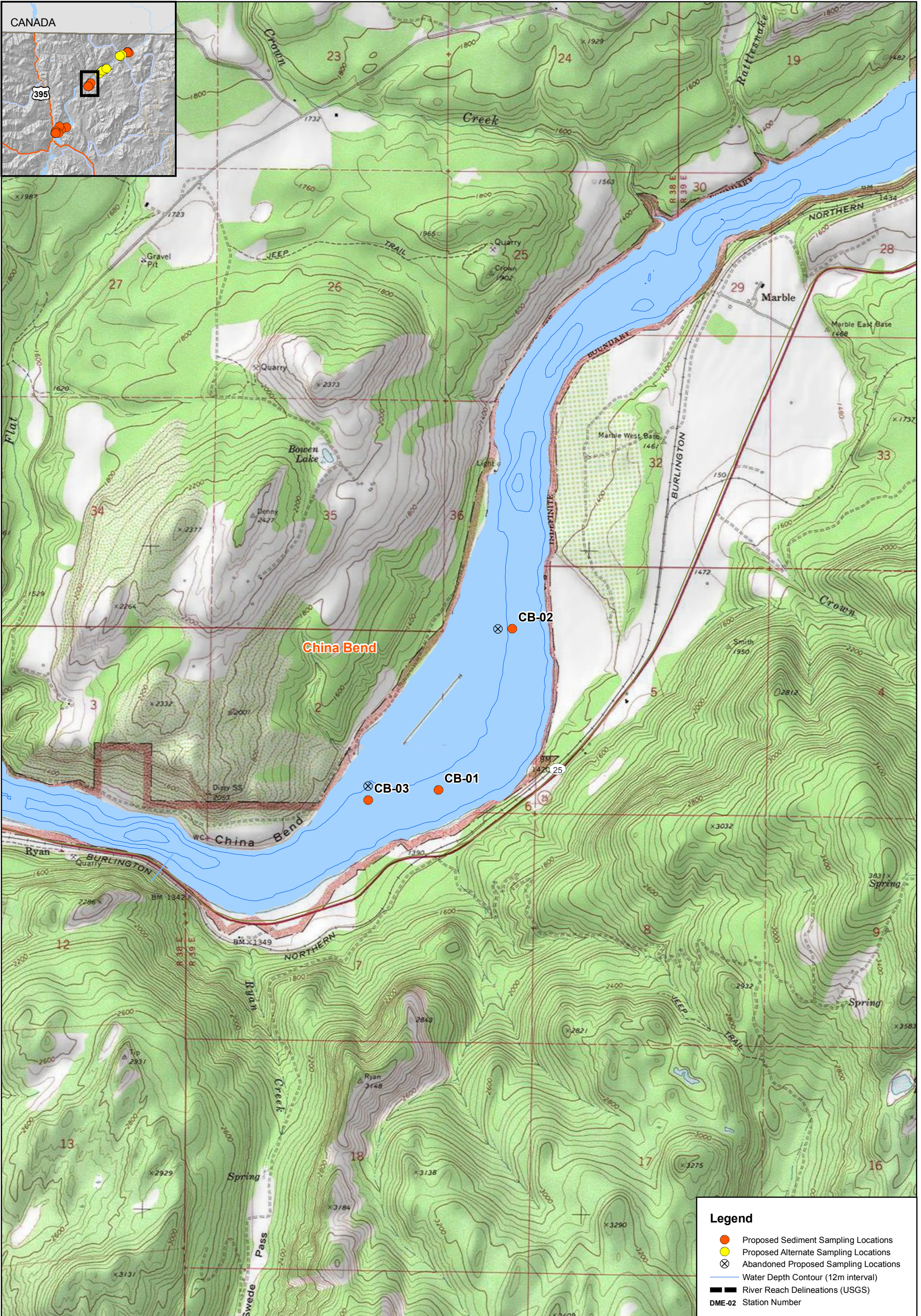
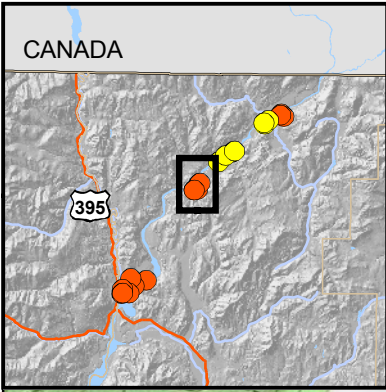
- Legend**
- Proposed Sediment Sampling Locations
  - Proposed Alternate Sampling Locations
  - ⊗ Abandoned Proposed Sampling Locations
  - Water Depth Contour (12m interval)
  - River Reach Delineations (USGS)
  - DME-02 Station Number

**Assessment of Sediment Toxicity to White Sturgeon**  
**June 22 to 27, 2010**



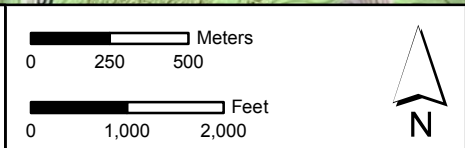
**URS Corporation**  
 Source:  
 GIS base layer Information  
 provided by Parametrix Inc.

**Map 3 Primary and Alternate Sample Locations - Little Dalles**  
 Upper Columbia River, WA



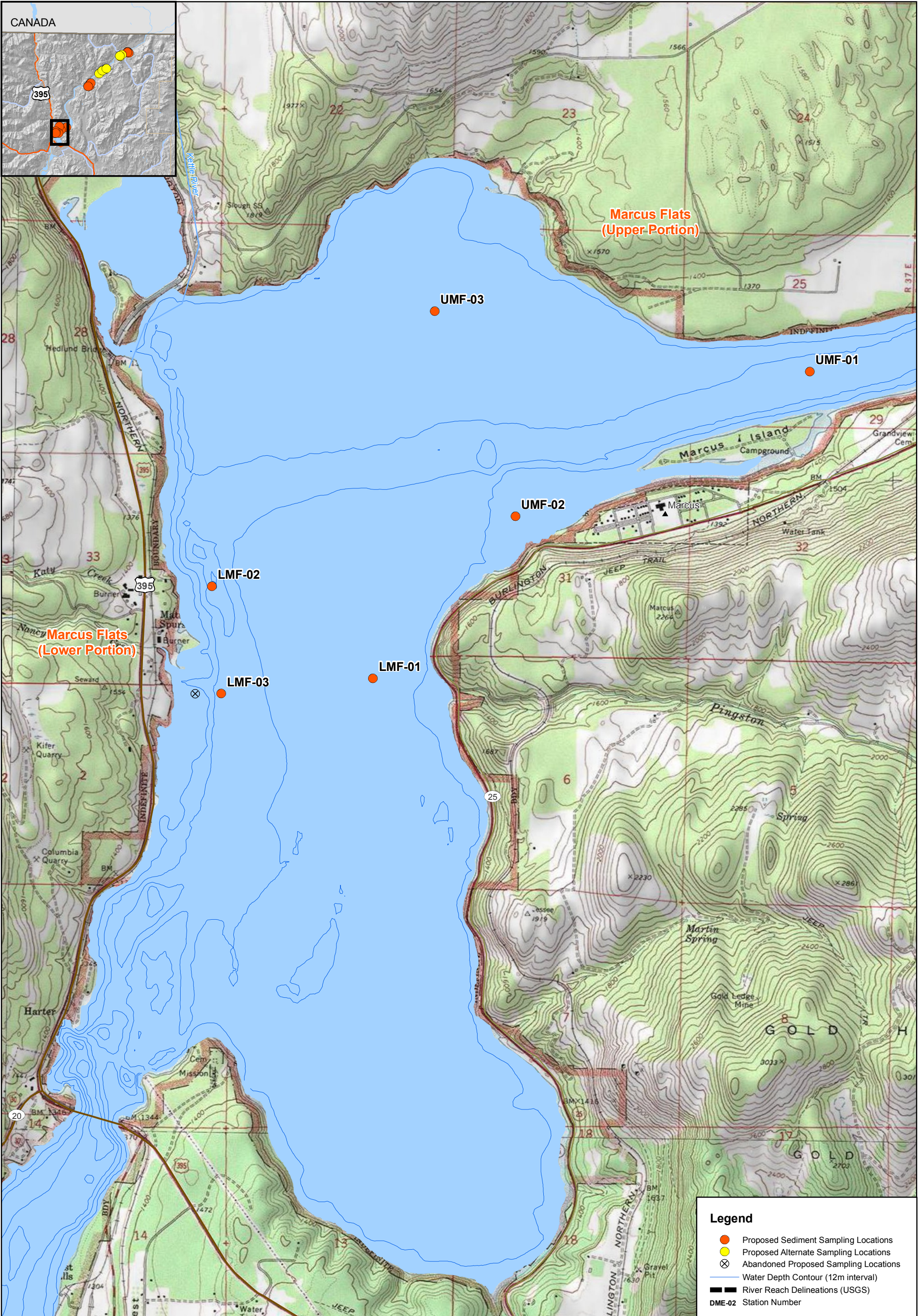
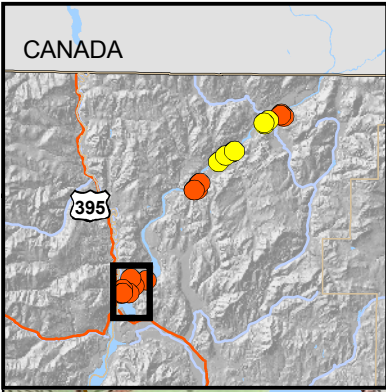
- Legend**
- Proposed Sediment Sampling Locations
  - Proposed Alternate Sampling Locations
  - ⊗ Abandoned Proposed Sampling Locations
  - Water Depth Contour (12m interval)
  - ▬ River Reach Delineations (USGS)
  - DME-02 Station Number

**Assessment of Sediment Toxicity to White Sturgeon**  
**June 22 to 27, 2010**



**URS Corporation**  
 Source:  
 GIS base layer Information  
 provided by Parametrix Inc.

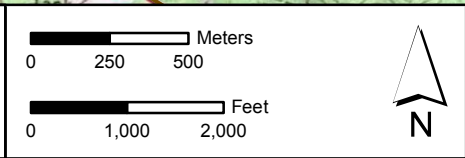
**Map 4 Primary and Alternate Sample Locations - China Bend**  
 Upper Columbia River, WA



**Legend**

- Proposed Sediment Sampling Locations
- Proposed Alternate Sampling Locations
- ⊗ Abandoned Proposed Sampling Locations
- Water Depth Contour (12m interval)
- River Reach Delineations (USGS)
- DME-02 Station Number

**Assessment of Sediment Toxicity to White Sturgeon**  
**June 22 to 27, 2010**



**URS Corporation**  
 Source:  
 GIS base layer Information  
 provided by Parametrix Inc.

**Map 5 Primary and Alternate Sample Locations - Lower and Upper Marcus Flats**  
 Upper Columbia River, WA

## APPENDIX A

### **Daily Field Notes**

Cultural Resources Monitoring Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010

**Confidential**

To avoid vandalism, restrict information in this report about the location of archaeological sites, as provided for by Section 304 of the National Historic Preservation Act, and Washington law, RCW 27.53.070 and RCW 42.56.30



Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/26/10

Location being sampled: Deadman's Eddy (DME) -02 (also DME-01 + DME-03)

Archaeological Monitor(s) present: S. McDaniel (URS)

Sampling Team Representative present: Jeff Leppo (URS)

Any known archaeology at location of event: No archaeological sites in or near (i.e. <500m)

DME-1, 2, or 3

Total number of sample locations (probes) at specific location being sampled: 0

Range of depth of samples taken: Approx. 5-10 m

General observations of sediment (color, texture, etc.): Current too fast. Couldn't grab sufficient

samples at any DME locations due to: 1) fast current 2) Rocks at

bottom of river preventing grabs from getting anything but trace sand of

mixed gravel material

Any observations of cultural material during this sampling event? Please explain: None

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Any disturbances/erosion observed at sampling location? Please explain briefly: \_\_\_\_\_

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Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

- At the discretion of the monitor, sampling may be slowed or halted at any time that a archaeological resource is suspected or encountered,
- Visual examination of the ground by a cultural resource monitor prior to placement of a sample probe,
- Move the location of the actual probe if necessary to avoid cultural or archaeological areas,
- Assistance from the sampling team(s) for the relocation of sampling areas should it be necessary,
- Documentation and recordation of daily observations, including field notes and photographs, to record the character of on-site sampling activities,
- Should a discovery be made, the field sampling team is instructed to cease field work at the respective sampling location and make the appropriate contacts

CONTACT INFORMATION FOR Principal Investigator

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Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/27/10

Location being sampled: Northport Alternate NP-01

Archaeological Monitor(s) present: S. McDaniel (URS)

Sampling Team Representative present: Jeff Leppo (URS)

Any known archaeology at location of event: 45ST 415 to Northeast. (CCS, tools, for-camp)

45ST 682 to immediate south of sample. (hx debris scatter in proximity to

Le Roi Smeaton complex [45ST 568]. along shoreline.)

Total number of sample locations (probes) at specific location being sampled: 0

Range of depth of samples taken: 0.8 m

General observations of sediment (color; texture, etc.): Failed after 6 attempts. Some coarse

sand and small cobbles, one boulder; prevents grab from closing.

None

Any observations of cultural material during this sampling event? Please explain: None

Cobbles examined for use-wear; none exhibited evidence for  
cultural modification

Any disturbances/erosion observed at sampling location? Please explain briefly: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

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Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/27/10

Location being sampled: Nort Rupert (Alternate) 02

Archaeological Monitor(s) present: S. McDaniel (URS)

Sampling Team Representative present: J. Leppo (URS)

Any known archaeology at location of event: No sites w/in or near sample location

Total number of sample locations (probes) at specific location being sampled: 0

Range of depth of samples taken: ~5m

General observations of sediment (color, texture, etc.): Couldnt get reasonable sample.

Seems there are large rocks preventing grab from taking a sample;  
only trace amt of sand recovered. Abandoned after 3 attempts.

Any observations of cultural material during this sampling event? Please explain: None

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Any disturbances/erosion observed at sampling location? Please explain briefly: \_\_\_\_\_

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Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/27/10

Location being sampled: Northport Altwater NP-03

Archaeological Monitor(s) present: S. McDaniel (URS)

Sampling Team Representative present: J. Leppo (URS)

Any known archaeology at location of event: No sites at or near (~500m) sample area

Total number of sample locations (probes) at specific location being sampled: 3 out of 10 proposed

Range of depth of samples taken: 3-5 m

General observations of sediment (color; texture, etc.): poorly graded fine to medium

sands; occasional cobbles; mixed parent material. Some grabs pulled

up rounded cobbles of various parent materials. Some organic material -

small roots, branches. Abandoned NP-03 after several further attempts -  
grabs kept getting insufficient samples - surface of sample "washed" & sample no good per QAPP.

Any observations of cultural material during this sampling event? Please explain: none

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Any disturbances/erosion observed at sampling location? Please explain briefly: \_\_\_\_\_

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Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/27/2010

Location being sampled: LD-01 (Little Dalles)

Archaeological Monitor(s) present: Michelle Stegner (URS) Jonathan Riehn (NPS)

Sampling Team Representative present: Jeff Leppo (URS)

Any known archaeology at location of event: No archaeological sites located within vicinity of sampling location.

Total number of sample locations (probes) at specific location being sampled: 10 5-gallon buckets (SD0013 F121-130)

Range of depth of samples taken: 20 - 23 m

General observations of sediment (color; texture, etc.): black silty sand with misc. organic debris

Any observations of cultural material during this sampling event? Please explain: Modern shoe and beer can.

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Any disturbances/erosion observed at sampling location? Please explain briefly: \_\_\_\_\_

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Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) -- 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/27/2010

Location being sampled: LD-02 (Little Dalles)

Archaeological Monitor(s) present: Michelle Stegner (URS) Jonathan Riehn (NPS)

Sampling Team Representative present: Jeff Leppo (URS)

Any known archaeology at location of event: No archaeological sites located within the vicinity of the sampling location.

Total number of sample locations (probes) at specific location being sampled: 0

Range of depth of samples taken: ~ 20m

General observations of sediment (color; texture, etc.): Cobbles prevented sampling

Any observations of cultural material during this sampling event? Please explain: No.

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Any disturbances/erosion observed at sampling location? Please explain briefly: \_\_\_\_\_

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Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/27/2010

Location being sampled: LD-03 (Little Dalles)

Archaeological Monitor(s) present: Michelle Stagner (URS) Jonathan Riehn (NPS)

Sampling Team Representative present: Jeff Leppo (URS)

Any known archaeology at location of event: No archaeological sites located within the vicinity of sampling location.

Total number of sample locations (probes) at specific location being sampled: 0

Range of depth of samples taken: 4.5 to 5 m

General observations of sediment (color; texture, etc.): No samples obtained due to cobbles

Any observations of cultural material during this sampling event? Please explain: No.

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---

Any disturbances/erosion observed at sampling location? Please explain briefly: \_\_\_\_\_

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---

Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

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Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/25/10

Location being sampled: China Bend CB 01 - 03  
CB-02 - (also CB-01 + CB-03)

Archaeological Monitor(s) present: Sarah McDaniel (URS) John Riehn (NPS)

Sampling Team Representative present: Jeff Leppo (URS)

Any known archaeology at location of event: Just outside banding for 45ST 65,  
submerged  
a large lithic scatter plus hx homestead, ST 84 into east and to (on shoreline)  
sites of several hearths, village.

Total number of sample locations (probes) at specific location being sampled: 10

Range of depth of samples taken: Approx 14.5-16.5m

General observations of sediment (color, texture, etc.): couldn't get samples; current too  
fast + bucket can't grab. Pulled up few cobbles, sticks, etc, but not sediment  
Exhausted all methods of trying to sample - quit China Bend.

Any observations of cultural material during this sampling event? Please explain: None

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Any disturbances/erosion observed at sampling location? Please explain briefly: \_\_\_\_\_

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Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

- At the discretion of the monitor, sampling may be slowed or halted at any time that a archaeological resource is suspected or encountered,
- Visual examination of the ground by a cultural resource monitor prior to placement of a sample probe,
- Move the location of the actual probe if necessary to avoid cultural or archaeological areas,
- Assistance from the sampling team(s) for the relocation of sampling areas should it be necessary,
- Documentation and recordation of daily observations, including field notes and photographs, to record the character of on-site sampling activities,
- Should a discovery be made, the field sampling team is instructed to cease field work at the respective sampling location and make the appropriate contacts

CONTACT INFORMATION FOR Principal Investigator

MICHAEL KELLY, URS

111 SW Columbia, Suite 1500, Portland, OR 97201

Home: (406) 600-3859, cell: (503) 475-2426

Email: [mike\\_kelly@urscorp.com](mailto:mike_kelly@urscorp.com)

Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/24/10

Location being sampled: UMF - 1 5391697N / 422645 E

Archaeological Monitor(s) present: Saman McDaniel (URS) John Riehn (NPS)

Sampling Team Representative present: Jeff Leppo (URS)

Any known archaeology at location of event: ST 37 - Old Marcus transit site - is

submerged near sample area (large + variously defined site boundary)

ST 180 - at or near - closer to shoreline (should be outside); hx Amverse dugouts,

Total number of sample locations (probes) at specific location being sampled: 10 5-gal buckets

Range of depth of samples taken: 29.3 m

General observations of sediment (color, texture, etc.): very dark gray, thin haige of silt over

well-graded sands

natural wood debris, roots, stems, bark, mixed in upper profile. Mixed sand,

mixed gravel materials

Any observations of cultural material during this sampling event? Please explain: none (except decomposing toilet paper w/in sample!)

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Any disturbances/erosion observed at sampling location? Please explain briefly: \_\_\_\_\_

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Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

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- Visual examination of the ground by a cultural resource monitor prior to placement of a sample probe,
- Move the location of the actual probe if necessary to avoid cultural or archaeological areas,
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Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/23/10

Location being sampled: UMF - 02

Archaeological Monitor(s) present: M. Kelly (URS); J. Ratzler (URS)

Sampling Team Representative present: J. Lepp; G. Panther (URS)

Any known archaeology at location of event: Sampling location at SW boundary of site ST-37, old Marcus Townsite

Total number of sample locations (probes) at specific location being sampled: 2 5-gallon buckets collected

Range of depth of samples taken: Water depth 10.5 - 10.9 m

General observations of sediment (color, texture, etc.): Dark green/gray silty sand & gravel w/ some organic debris

Sampling at this location will be continued tomorrow

Any observations of cultural material during this sampling event? Please explain: None

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Any disturbances/erosion observed at sampling location? Please explain briefly:

None noted.

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Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

- At the discretion of the monitor, sampling may be slowed or halted at any time that a archaeological resource is suspected or encountered,
- Visual examination of the ground by a cultural resource monitor prior to placement of a sample probe,
- Move the location of the actual probe if necessary to avoid cultural or archaeological areas,
- Assistance from the sampling team(s) for the relocation of sampling areas should it be necessary,
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- Should a discovery be made, the field sampling team is instructed to cease field work at the respective sampling location and make the appropriate contacts

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Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/24/10

Location being sampled: VMF-2 (Upper Marcus Flatz)

Archaeological Monitor(s) present: Jonah Riehn (NPS), Sarah McDaniel (URS)

Sampling Team Representative present: Jeff Leppo (URS), Gary Panther (URS)

Any known archaeology at location of event: Marcus townsite 45ST37 at or near;

Trumble - often GPS units having trouble initially. Assume when townsite, which was removed to current location ca. 1991. Remaining structures were burned/razed. Also site of ethno. village

Total number of sample locations (probes) at specific location being sampled: 10 (8 today, + 2 yesterday)

Range of depth of samples taken: 35'

General observations of sediment (color, texture, etc.): eg. 10 YR 5/6 very dark brown silt, very little sand

Some pieces of short grass in a few of the grabs - thought to have settled here but from upriver source.

Any observations of cultural material during this sampling event? Please explain: none

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---

Any disturbances/erosion observed at sampling location? Please explain briefly: N/A - unable

to discern

---

Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

- At the discretion of the monitor, sampling may be slowed or halted at any time that a archaeological resource is suspected or encountered,
- Visual examination of the ground by a cultural resource monitor prior to placement of a sample probe,
- Move the location of the actual probe if necessary to avoid cultural or archaeological areas,
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photos

1. sample extraction, facing N
2. " " "
3. close up bucket
4. overview of boat @ location

Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/24/10

Location being sampled: UMF-3 5392082° 420017

Archaeological Monitor(s) present: S. McDaniel - URS - John Riehn (NPS)

Sampling Team Representative present: Jeff Leppo

Any known archaeology at location of event: Outside <sup>(>100m)</sup> site boundaries of ST 103 and ST 45, near Kettle Falls R. District,

Total number of sample locations (probes) at specific location being sampled: 10

Range of depth of samples taken: 18-20m

General observations of sediment (color, texture, etc.): very dk gray, silt with decomposing organics like pine needles, River mud, occasional small sticks

Any observations of cultural material during this sampling event? Please explain: none

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Any disturbances/erosion observed at sampling location? Please explain briefly: n/a

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Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

- At the discretion of the monitor, sampling may be slowed or halted at any time that a archaeological resource is suspected or encountered,
- Visual examination of the ground by a cultural resource monitor prior to placement of a sample probe,
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Email: mike\_kelly@urscorp.com

2

Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/22/10

Location being sampled: LMF - 01

Archaeological Monitor(s) present: M. Kelly (NAS); J. Reitzel (NPS)

Sampling Team Representative present: J. Leppo, G. Panther

Any known archaeology at location of event: No previously recorded archaeological sites in vicinity of sampling location

Total number of sample locations (probes) at specific location being sampled: 20 sample probes, 10 5-gall buckets

Range of depth of samples taken: 19 - 19.5 meters

General observations of sediment (color, texture, etc.): Sample LMF-01-001 returned dark gray to black silt/clay; 19 additional grabs required to fill 10 buckets. All yielded similar black/gray silt w/ some fine sand, classified as river mud.

Any observations of cultural material during this sampling event? Please explain: None

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Any disturbances/erosion observed at sampling location? Please explain briefly:

No Disturbances

note - water depth exceeds 19 m.

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Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

- At the discretion of the monitor, sampling may be slowed or halted at any time that a archaeological resource is suspected or encountered,
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- Move the location of the actual probe if necessary to avoid cultural or archaeological areas,
- Assistance from the sampling team(s) for the relocation of sampling areas should it be necessary,
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- Should a discovery be made, the field sampling team is instructed to cease field work at the respective sampling location and make the appropriate contacts

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Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/23/10

Location being sampled: LMF - 02

Archaeological Monitor(s) present: M. Kelly (URS); J. Reitzel (NS)

Sampling Team Representative present: J. Leys; G. Parker

Any known archaeology at location of event: No previously recorded sites in vicinity of sampling location.

Total number of sample locations (probes) at specific location being sampled: 5 1/2 5-gal buckets; 2-2.5 grabs per bucket.

Range of depth of samples taken: Water depth 45.5 m

General observations of sediment (color, texture, etc.): Samples LMF-02 - 001 & 002 returned mixed dark gray sands and silts with an extremely high quantity of wood debris (bark, sticks, etc.). Some minor adjustment of sampling location required to improve collection of sediments. Sampling location abandoned after multiple failures, due to wood debris.

Any observations of cultural material during this sampling event? Please explain: None

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Any disturbances/erosion observed at sampling location? Please explain briefly:

Dense woody

debris on river floor, hindering sample collection. Area  
off-shore at old lumber mill; area used to store log  
rafts for 50+ years.

Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

- At the discretion of the monitor, sampling may be slowed or halted at any time that a archaeological resource is suspected or encountered,
- Visual examination of the ground by a cultural resource monitor prior to placement of a sample probe,
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Cultural Resource Monitoring Form-

Upper Columbia River Remedial Investigation and Feasibility Study (UCR RI/FS) – 2010 Sampling for the Assessment of Sturgeon Toxicity to White Sturgeon QAPP/Amendment No. 1

Date of sampling event: 6/23/10

Location being sampled: LMF-03

Archaeological Monitor(s) present: M. Kelly (URS); J. Retzer (NPS)

Sampling Team Representative present: J. Leppo, G. Panther (URS)

Any known archaeology at location of event: FE-16; FE-157; FE-158. All sites

are located 100+ m to the west, above drop-off into original  
river channel. Sampling location is within channel

Total number of sample locations (probes) at specific location being sampled: 1 5-gall bucket collected

Range of depth of samples taken: 28.5 m

General observations of sediment (color, texture, etc.): Dark gray, silty sand w/ gravels

and cobbles. Cobbles prevented sampling unit from closing;

Sampling location abandoned after multiple attempts and

frequent repositioning

Any observations of cultural material during this sampling event? Please explain: None

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Any disturbances/erosion observed at sampling location? Please explain briefly: None observed.

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Per Cultural Resource Coordination Plan (CRCP), on site tasks include:

- At the discretion of the monitor, sampling may be slowed or halted at any time that a archaeological resource is suspected or encountered,
- Visual examination of the ground by a cultural resource monitor prior to placement of a sample probe,
- Move the location of the actual probe if necessary to avoid cultural or archaeological areas,
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## APPENDIX B

### **Daily Attendance and Health and Safety Records**


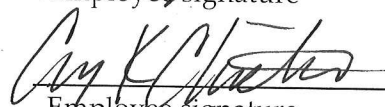

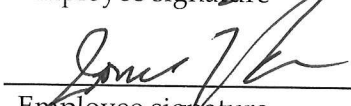

Field Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010



## SITE HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT

This general SHSP is approved by the Consultants for use at the Site. This general SHSP is the minimum health and safety standard for the Site and will be strictly enforced for Consultants personnel and other subcontracted personnel where applicable. Subcontracted personnel may request to adopt the general SHSP in lieu of a subcontractor-specific SHSP, but must obtain prior written approval by the contracting Consultants and provide written concurrence from the subcontractor that the subcontractor will assume direct responsibility and liability for administering the plan for its employees.

I have reviewed this general SHSP dated August 25, 2009, for the Site RI/FS fieldwork. I have had an opportunity to ask any questions I may have and have been provided with satisfactory responses. I understand the purpose of the plan, and I consent to adhere to its policies, procedures, and guidelines.

 Employee signature	<u>CH2M HILL</u> Company	<u>6/22/10</u> Date
 Employee signature	<u>ENVIRONMENT INT.</u> Company	<u>6/22/10</u> Date
 Employee signature	<u>NPS</u> Company	<u>6/22/10</u> Date
 Employee signature	<u>NPS</u> Company	<u>6/22/10</u> Date
 Employee signature	<u>CH2M HILL</u> Company	<u>6/24/10</u> Date
_____ Employee signature	_____ Company	_____ Date
_____ Employee signature	_____ Company	_____ Date

## 12. SAFETY AND HEALTH PLAN AGREEMENT

By their signature, the following undersigned site workers or visitors certify that this plan has been read, or otherwise communicated to them. They further certify that they completely understand this plan and will follow its procedures for the protection of the health and safety of all persons entering this site.

<u>NAME</u>	<u>DATE</u>
<u>Jeff Leppo</u>	<u>6/22/10</u>
<u>Michael Kelly</u>	<u>6/22/10</u>
<u>Jim D. Parthen</u>	<u>6-22-10</u>
<u>Eric Weatherman</u>	<u>6-22-10</u>
<u>[Signature]</u>	<u>6-22-10</u>
<u>[Signature]</u>	<u>6/22/10</u>
<u>[Signature]</u>	<u>6/27/10</u>







Daily Attendance Record  
 UCR Sediment Toxicity Study  
 U.S Sections

Date 6, 23 / 2010

Name	Signature	Company	Representing
Jeff Leppo	[Signature]	URS	Teck
Michael Kelly	[Signature]	URS	Teck
René Trudeau	[Signature]	GRAVITY	
Jim RETZER	[Signature]	NPS	NPS
GARY PANTMEY	[Signature]	URS	TECK
Allen Burkhardt	[Signature]	columbia Nav.	
MARCELLA RIVICH	[Signature]	CH2M HILL	EPA
CRAIG CHRISTIAN	[Signature]	EI	CCT/ECOLOG
Jon Edwards	[Signature]	NPS	NPS
ERIC WEATHERMAN	[Signature]	CNI	



Daily Attendance Record  
 UCR Sediment Toxicity Study  
 U.S Sections

Date 6, 24 / 2010

Name	Signature	Company	Representing
Jeff Leppo	<i>Jeff Leppo</i>	URS	Teck
Nicole Badon	<i>Nicole Badon</i>	CH2M HILL	EPA
Sarah McDaniel	<i>Sarah McDaniel</i>	URS	Teck
CRAIG CHRISTIAN	<i>Craig Christian</i>	ET	CCT / Ecology
Jonathan Rehn	<i>Jonathan Rehn</i>	NPB	NPS
René Trudeau	<i>René Trudeau</i>	GRAVITY	Teck
JEFF WILSON	<i>Jeff Wilson</i>	GRAVITY	TECK
GARY PAWNER	<i>Gary Pawner</i>	URS	TECK
Allen Barkham	<i>Allen Barkham</i>	columbia Nav.	
Eric Weatherman	<i>Eric Weatherman</i>	CNI	CNI



Daily Attendance Record  
UCR Sediment Toxicity Study  
U.S Sections

Date 6, 25 / 2010

Name	Signature	Company	Representing
Jonathan Rehn		NPS	NPS
Rene Trudeman		GRAVITY	TECK
JEFF WILSON		GRAVITY	TECK
Nicole Badon		EH2M HLL	EPA
ERIC WEATHERMAN		CNI	CNI
Sarah McDaniel		URS	Teck
Allen Burkhardt		Columbia Navigation	CNI
CRAIG CHRISTIAN		ET	CCT/ECOLOGY
Jeff Leppu		URS	Teck



Daily Attendance Record  
UCR Sediment Toxicity Study  
U.S Sections

Date 6, 26 / 2010

Name	Signature	Company	Representing
Jeff Leppo		URS	Teck
CRAIG CHRISTIAN		EP	CEL/Ecology
Sarah McDaniel		URS	Teck
ERIC WEATHERMAN		CNI	CNI
Allen Burkhardt		CNI	CNI
Nicole Badon		CH2M HILL	EPA
JEFF WILSON		GRAVITY	TECK
René Trudeau		GRAVITY	



Daily Attendance Record  
 UCR Sediment Toxicity Study  
 U.S Sections

Date 6 / 27 / 2010

Name	Signature	Company	Representing
Jeff Leppo	<i>[Signature]</i>	URS	Teck
René Trudeau	<i>[Signature]</i>	GRAVITY	Teck
CRAIG CHRISTIAN	<i>[Signature]</i>	EI	CET/ECOLOG
Allen Burkhardt	<i>[Signature]</i>	CNI	CNI
ERIC WEATHERMAN	<i>[Signature]</i>	CNI	CNI
JEFF WILSON	<i>[Signature]</i>	GRAVITY	TECK
Nicole Badon	<i>[Signature]</i>	CHEM HILL	EPA
Sarah McDanid	<i>[Signature]</i>	URS	Teck
	↓ New Arrival @ Palouse	/ Northport	Boat Launch
Jonathan Rich	<i>[Signature]</i>	NPS	NPS
Michelle Stegner	<i>[Signature]</i>	URS	Teck

12:30

## APPENDIX C

### **Photographs with Descriptions**

Field Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010





**Health and safety meeting at Kettle Falls Boat Launch, June 22, 2010**

**Morning mobilization for sediment sampling at Kettle Falls Boat Launch, June 23, 2010**





**RV Palouse work deck with sample and decontamination equipment**

**Power Grab Sampler**







**Lowering the Power Grab Sampler into the water from the overhead boom.**

**Power Grab Sampler on bottom and ready for pneumatic-actuation. Grab sample in Lexan tub.**





**Power Grab Sampler retrieved over work deck and ready for release into Lexan tub**

**Release of sediment sample into Lexan tub**



**Transferring sediment sample to the 5-gallon HDPE containers**



**De-ionized water rinse step of Power Grab Sampler decontamination**





**Liquinox™ soap wash of Lexan tub with brush**

**Red leech from sample at station LMF-02**





**Mollusk from  
sample at  
station UMF-01**

**Grasses on  
sediment  
surface in  
sampler at  
station UMF-02**





**Macro-invertebrate in sampler at station DME-1, top edge of photo.**

**Snails on sediment surface at station LD-01**





**Sample aliquot  
for unique  
sample identifier  
LMF-01-001**

**Close-up view  
of sample  
aliquot for  
unique sample  
identifier LMF-  
01-001**





**Wood debris in sample preventing closure of sampler, sample attempt rejected**

**Sample aliquot for unique sample identifier LMF-02-002**





**Sample aliquot for  
unique sample  
identifier LMF-02-  
003**



**Sample aliquot for  
unique sample  
identifier LMF-02-  
003 in  
decontaminated  
5-gallon HDPE  
container  
(Container Tag  
No. T012)**



**Sample aliquot for  
unique sample  
identifier LMF-03-  
001**



**Wood debris and  
cobble in sampler  
at station LMF-03,  
sample attempt  
rejected.**



**Sample aliquot for  
unique sample  
identifier UMF-02-  
004**



**Close-up view of  
sample aliquot for  
unique sample  
identifier UMF-02-  
005**



**Sample aliquot for  
unique sample  
identifier UMF-02-  
009 in sampler**



**Sample aliquot for  
unique sample  
identifier UMF-01-  
003 in sampler**



**Close-up view of  
sample aliquot for  
unique sample  
identifier UMF-01-  
010**



**Sample aliquot for  
unique sample  
identifier UMF-03-  
007**





**Sample aliquot  
for unique  
sample  
identifier UMF-  
03-009**

**Sample  
washing and  
poor recovery  
at station CB-  
02, sample  
attempt  
rejected**





**Preparation for  
use of van Veen  
Sampler at  
station CB-02**

**Use of anchored  
buoy for  
marking station  
coordinate  
boundary at  
station CB-02**





**Water-only recovery at station CB-01**

**Sample washing and poor recovery at station CB-01, sample attempt rejected**







**Boulder-only  
recovery at  
station CB-01,  
sample attempt  
rejected**

**Wood debris in  
sampler at station  
CB-03, sample  
rejected**



**Sample washing  
and poor recovery  
at station CB-03,  
sample attempt  
rejected**



**Gravels and  
cobbles blocking  
sampler with  
sample washing  
at station CB-03,  
sample attempt  
rejected**





**General view of  
Deadman's Eddy  
river section,  
looking north**



**Boulder in  
sampler at  
station DME-02,  
sample attempt  
rejected**



**Gravel, cobble,  
and boulder  
sample at  
station DME-  
02, sample  
attempt  
rejected**

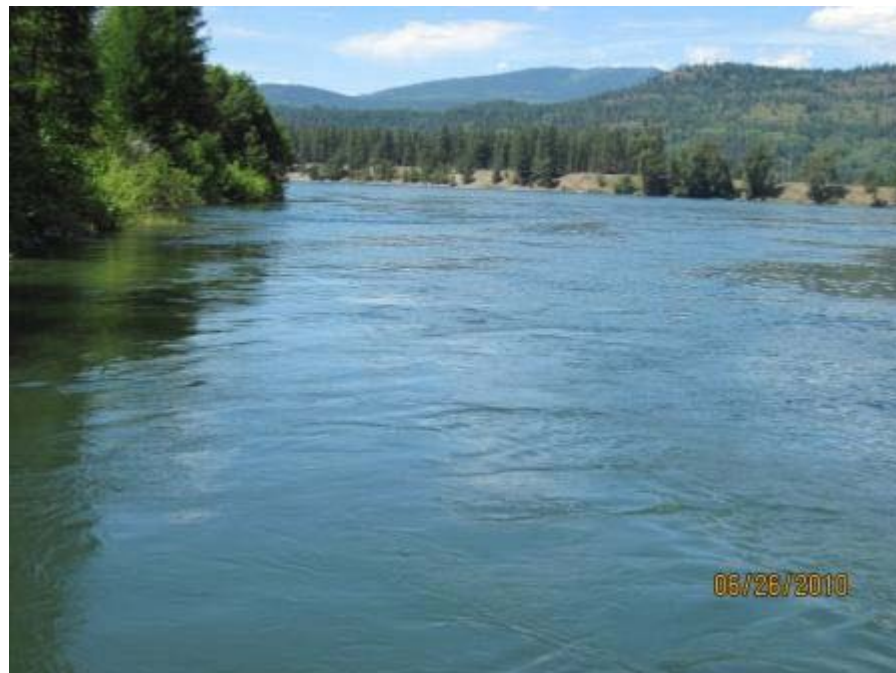
**Gravels,  
cobbles and  
boulders in  
sampler at  
station DME-01,  
sample attempt  
rejected**





**Water-only in  
sampler at  
station DME-03**

**General view at  
station DME-03  
river section,  
looking south**





**Water and trace sand in sampler at station NP-02**

**General view of station NP-02 river section, looking north**





**Sample aliquot  
for unique  
sample identifier  
NP-03-001**

**Close-up view of  
sample aliquot for  
unique sample  
identifier NP-03-  
003**



**Cobbles and boulders with washing in sample aliquot attempt for unique sample identifier NP-03-004, sample rejected**



**Boulders at station NP-01**





**General river view  
of station LD-03,  
looking north**



**Boulder in  
sampler at LD-03,  
sample attempt  
rejected**



**Gravels and cobbles blocking sampler at station LD-02**



**Sample in Lexan tray at LD-02, sample rejected due to sampler blocking and washing**



**General river view  
of Station LD-01,  
looking southeast**



**Sample aliquot for  
unique sample  
identifier LD-01-  
004 in sampler**



**Rejected sample attempt at unique sample identifier LD-01-006, with athletic shoe**



**Sample aliquot for unique sample identifier LD-01-009 in sampler**



APPENDIX D

**Sediment Sample Field Logs**

Field Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010





FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-01

June 2010

Sample No. : SD00 01

Sample Tag : T 001

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport Lower Dalles LD =	
GRAB SAMPLE NO. (001 THROUGH 010)*	001		SAMPLE IDENTIFIER LMF. 01 .001		
*Grab Sample = One Bucket			LOCATION - STATION NO. - GRAB NO.		
WATER DEPTH	(M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)		
19.4		5389530	419591		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell) wet	Very dark gray to black 10 YR 3, 1			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	Dark brown 10 YR 3, 3			Matrix Color / Grain Size Notes: Streaked color matrix, visible. Predominate black	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	Organic material / discoloration		
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	Decomposed, musty organic odor		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Decomposed organic matter appears to contribute to dark color.

Boat: Palouse (Gravity Environmental)	Photo Directory: UCR Sed 6-22-2010
Sampler Type: Power Grab (Gravity Environmental)	Photo File: 033-036

Sampler Name: Jeff Lopez  
 Sample Signature: [Signature]  
 Date: 6, 22 2010  
 Time: 15:00

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



**FIELD SAMPLE LOG - SEDIMENTS**  
 Upper Columbia River - White Sturgeon Sediment Toxicity Study  
 United States Locations/Stations

LMF-01  
 June 2010

Sample No. : SD00 0 1 Sample Tag : T 0 0 2

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03		NP = Northport LD = Lower Dalles
GRAB SAMPLE NO. (001 THROUGH 010)* <u>002</u>		SAMPLE IDENTIFIER <u>LMF . 01 . 002</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M/ FT) <u>19.0</u>		UTM Northing (NAD83) <u>5389529</u>		UTM Easting (NAD83) <u>419587</u>	

**PHYSICAL CHARACTERISTICS**

<input type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Dark greyish brown 10 YR 3, 1</u>		<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) <u>Dark brown 10 YR 4, 3</u>		Matrix Color / Grain Size Notes: <u>Some streaking of lighter color</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Decomposed organics</u>		Sampler Penetration: <u>25</u> cm
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Decomposed musky organic</u>		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No   
 (Please refer to URS archaeologist field monitoring notes)

Other Notes:  
River muds, some very fine sands. Primarily silts & clayey, low plasticity

Boat: Palouse (Gravity Environmental) Photo Directory: UCR Sed 6-22-2010  
 Sampler Type: Power Grab (Gravity Environmental) Photo File: 037-039

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 6, 1, 2010  
 Time: 15:00  
2 Hours

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-01

June 2010

Sample No. : SD00 01

Sample Tag : T 003

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<u>DME</u>	<u>CB</u>	<u>UMF</u>	<u>LMF</u>	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>003</u>		SAMPLE IDENTIFIER <u>LMF. 01 . 003</u>		LOCATION - STATION NO. - GRAB NO.	
*Grab Sample = One Bucket					
WATER DEPTH	<u>19.3</u> (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)		
		<u>5389529</u>	<u>419591</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Black</u>	<u>10 YR 3, 1</u>	<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures		
Color (Munsell)	<u>Dark yellowish brown</u>	<u>10 YR 4, 6</u>	Matrix Color / Grain Size Notes:		
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Decomposed organic matter</u>		
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Decomposed organic slight odor</u>		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			Sampler Penetration: <u>25</u> cm		
Cultural Resources Notes: URS Archaeologist - Mike Kelly <input checked="" type="checkbox"/> Sarah McDaniel <input type="checkbox"/>			Cultural Resources Observed: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Other Notes:					
Boat: Palouse (Gravity Environmental)			Photo Directory: <u>UCR Sed 6-22-2010</u>		
Sampler Type: Power Grab (Gravity Environmental)			Photo File: <u>040 - 041</u>		

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 6, 22 / 2010  
 Time: 15:25

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)





FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-01

June 2010

Sample No. : SD00 01

Sample Tag : T 004

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	004		SAMPLE IDENTIFIER LMF. 01 .004		
*Grab Sample = One Bucket					
WATER DEPTH	(M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)		
19.6		5389529	419594		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	Black / Dark Grayish Br. 10 YR 2 / 1			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR 1			Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: Decomposed organic		Sampler Penetration: 10-15 cm	
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: Decomposed, slight sewage odor			
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: UCR Sed 6-22-2010
Sampler Type: Power Grab (Gravity Environmental)	Photo File: No photo collected of Sample Info or Sample

Sampler Name: Jeff Leggo  
 Sample Signature: [Signature]  
 Date: 6/1/2010  
 Time: 15:40

042-043

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-01

June 2010

Sample No. : SD00 01 Sample Tag : T 005

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 005 SAMPLE IDENTIFIER LMF-01-005

\*Grab Sample = One Bucket

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>19.7</u>	<u>5389530</u>	<u>419598</u>

LOCATION - STATION NO. GRAB NO.

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Dark grayish/very gray YR 3, 1</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	<u>Dark yellowish brown 10 YR 4, 4</u>			Matrix Color / Grain Size Notes: <u>Lamellae streaky of yellow brown</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Decomposed organic matter, sulfur (slight)</u>		
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Sewage odor, sulfur</u>		
Sampler Penetration:				<u>20 cm</u>	

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
River mud, silt, organic matter, few very fine sands

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-22-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>044-046</u>

Sampler Name: Jeff Pappo

Sample Signature: [Signature]

Date: 6, 22 /2010

Time: 15:54

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-01

June 2010

Sample No. : SD00 01

Sample Tag : T 006

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport Lower Dalles LD =	

GRAB SAMPLE NO. (001 THROUGH 010)\* 006 SAMPLE IDENTIFIER LMF. 01 - 006  
\*Grab Sample = One Bucket  
 WATER DEPTH 19.0 (M / FT) UTM Northing (NAD83) 5389530 UTM Easting (NAD83) 419605  
 LOCATION - STATION NO. - GRAB NO.

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>10 YR Very dark grey 10 YR 3, 1</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____		Matrix Color / Grain Size Notes: <u>dark Some yellowish brown striations</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Decomposing organic matter</u>		
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Slight sewage to sulfur smell, decomposing organic matter</u>		Sampler Penetration: <u>20</u> cm
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input type="checkbox"/>		

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:

Boat: Palouse (Gravity Environmental) Photo Directory: UCR Sed 6-22-2010  
 Sampler Type: Power Grab (Gravity Environmental) Photo File: No Photo of Sample - Info Only

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 6, 22, 2010  
 Time: 16:12

047-048  
 Photos Blurred

Sample Labeling (Refer to QAPP and Sample Key)  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-01  
June 2010

Sample No. : SD00 01 Sample Tag : T 007

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>007</u>		SAMPLE IDENTIFIER <u>LMF-01-007</u>		LOCATION - STATION NO. - GRAB NO.	
*Grab Sample = One Bucket					
WATER DEPTH	<u>18.9</u> (M/FT)	UTM Northing (NAD83)	UTM Easting (NAD83)		
		<u>5389529</u>	<u>419599</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark gray to black 10 YR 3/1</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	<u>10 YR 2/1</u>			Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Decomposing Organic Matter</u>		
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Slight sewage to sulfur odor - decomposing organic matter</u>		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				Sampler Penetration: <u>20</u> cm	

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Boat: Palouse (Gravity Environmental) Photo Directory: UCR Sed 6-22-2010  
Sampler Type: Power Grab (Gravity Environmental) Photo File: 049-051

Sampler Name: Jeff Heppo  
Sample Signature: [Signature]  
Date: 6, 22, 2010  
Time: 16:30

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



**FIELD SAMPLE LOG - SEDIMENTS**  
 Upper Columbia River - White Sturgeon Sediment Toxicity Study  
 United States Locations/Stations

LMF-01  
 June 2010

Sample No. : SD00 01

Sample Tag : T 008

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>008</u>		SAMPLE IDENTIFIER <u>LMF . 01 . 008</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH <u>19.3</u> (M/FT)		UTM Northing (NAD83) <u>5389530</u>		UTM Easting (NAD83) <u>419592</u>	

**PHYSICAL CHARACTERISTICS**

<input type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray to black 10 YR 3, 1</u>		<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) <u>10 YR 2, 1</u>		Matrix Color / Grain Size Notes:
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Decomposing organic matter</u>		
Odors Yes <input type="checkbox"/> No <input type="checkbox"/> Description: <u>Slight sewage odor, sulfurous</u>		Sampler Penetration: <u>10 to 15 cm</u>
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-22-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 052-053

Sampler Name: Jeff Lepp

Sample Signature: [Signature]

Date: 6/1/2010

Time: 16:35

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-01

June 2010

Sample No. : SD00 01

Sample Tag : T 009

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03		NP = Northport LD = Lower Dalles
GRAB SAMPLE NO. (001 THROUGH 010)* <u>009</u>		SAMPLE IDENTIFIER <u>LMF-01-009</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M) (FT) <u>19.2</u>		UTM Northing (NAD83) <u>5389527</u>		UTM Easting (NAD83) <u>419592</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grayish brown 10 YR 3/2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR <u>1</u>			Matrix Color / Grain Size Notes: <u>No striations</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Decomposing organic matter</u>		Sampler Penetration: <u>10</u> cm	
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Sewage/sulfur odor very slight</u>			
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> <u>Occasional fine whitish roots? 1 to 2mm diameter</u>					
Cultural Resources Notes: URS Archaeologist - Mike Kelly <input checked="" type="checkbox"/> Sarah McDaniel <input type="checkbox"/>			Cultural Resources Observed: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-22-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>No photo of sample, info only 054</u>

Sampler Name: Jeff Goppo  
 Sample Signature: [Signature]  
 Date: 6, 22 /2010  
 Time: 16:50

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME- SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-01

June 2010

Sample No. : SD00 01

Sample Tag : T 010

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	<b>LMF</b>	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>010</u>		SAMPLE IDENTIFIER <u>LMF . 01 . 010</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT)		UTM Northing (NAD83)		UTM Easting (NAD83)	
<u>19.6</u>		<u>419590</u>		<u>5389529</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grayish brown 10 YR 3 / 2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR /			Matrix Color / Grain Size Notes: <u>Uniform color</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Decomposing organic matter</u>		Sampler Penetration: <u>18</u> cm	
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Sewage / Sulfur odor</u>			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes: River mud - more silt / high liquid to solids content

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-22-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>055-057</u>

Sampler Name: Jeff Loppo  
 Sample Signature: [Signature]  
 Date: 6 / 22 /2010  
 Time: 17 : 05

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-02

June 2010

Sample No. : SD00 02

Sample Tag : T 011

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 001 SAMPLE IDENTIFIER LMF . 02 . 001  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>42.3 44.1</u>	<u>5390160</u> <del>5390158</del> <i>gjac</i>	<u>418461</u> <del>418469</del> <i>gjac</i>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>10YR Black</u> <u>10 YR 2, 1</u>	Matrix Color / Grain Size Notes: <u>ML over black sands.</u>	
Color (Munsell) <u>Very dark grayish brown</u> <u>10 YR 3 2</u>	Sampler Penetration: <u>10 to 15 cm</u>	
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>roots, pine cones, sticks</u>		
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Slight musky odor</u>		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
See "Other Notes" Reddish colored - leech, worm. Placed in bucket

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Reject first power grab - stick stuck inside of clamp jaws. Woody debris - stick size 2 to 15 mm diameter. Pine cones, decomposed.  
5 cm Silt over black sand. Roots and some woody debris in first sampler. Move boat

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-23-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>069-080</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 23 2010  
Time: 09:30 50 *gjac*  
Correction - repairs to airline delays sample

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)





FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-02

June 2010

Sample No. : SD00 02 Sample Tag : T 012

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	<b>LMF</b>	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 002 SAMPLE IDENTIFIER LMF.02.002  
\*Grab Sample = One Bucket  
LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>44.3</u>	<u>5390160</u>	<u>418461</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark grayish brown</u> YR <u>3, 2</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) <u>Black</u> YR <u>3, 1</u>		Matrix Color / Grain Size Notes: <u>Brown silt over black sands</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Small woody sticks/stems</u>		Sampler Penetration: <u>15-20</u> cm
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Musky</u>		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Wood fragments - sticks

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Varying silt thickness overlying black sand. Sands are primarily poorly graded medium. Silt thickness difficult to define, dependent on location of grab. Poor recovery on sample, which are rejected - sticks in sampler

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-23-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>081-084</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 23 /2010  
Time: 10:35

Sample Labeling (Refer to QAPP and Sample Key)  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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LMF-02

June 2010

Sample No. : SD00 02

Sample Tag : T 013

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	<b>LMF</b>	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>003</u>		SAMPLE IDENTIFIER <u>LMF. 02. 003</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT)		UTM Northing (NAD83)		UTM Easting (NAD83)	
<u>45.2</u>		<u>5390158</u>		<u>418460</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grayish brown</u> YR <u>1</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	<u>Black</u> 10 YR 2 / 1			Matrix Color / Grain Size Notes: <u>Brown silt over black sand</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>organic litter</u>		Sampler Penetration: <u>15 to 20 cm</u>	
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>musky</u>			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Clam, small organic debris (few)

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel

Cultural Resources Observed: Yes  No

Other Notes:

Less silt w/ this sample. Primarily black sands, mixed w/ silts. Layered silt, but less on this grab

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6\_23\_2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 085-087

Sampler Name: Jeff Leppu

Sample Signature: [Signature]

Date: 6, 23 /2010

Time: 10:55

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



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LMF-02

June 2010

Sample No. : SD00 02 Sample Tag : T 014

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	<b>LMF</b>	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>004</u>		SAMPLE IDENTIFIER <u>LMF . 02 . 004</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT) <u>43.9</u>		UTM Northing (NAD83) <u>5390150</u>		UTM Easting (NAD83) <u>418467</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Black sand</u>	<u>10 YR 2, 1</u>		<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	<u>Dark brown</u>	<u>10 YR 3, 3</u>		Matrix Color / Grain Size Notes: <u>silt over sand</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>sticks, stems</u>		Sampler Penetration: <u>15-20</u> cm	
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>musky, nondescript</u>			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Few sticks 10 to 20mm, changes in # and size / limit grabs

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Black sand overlain by silt. 2 failed attempts on recovery due to sticks, debris.

Boat: Palouse (Gravity Environmental) Photo Directory: UCR Sed 6-23-2010  
Sampler Type: Power Grab (Gravity Environmental) Photo File: 088-091

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 23 /2010  
Time: 11:15

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



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LMF-02

June 2010

Sample No. : SD00 02 Sample Tag : T 015

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>005</u>		SAMPLE IDENTIFIER <u>LMF .02 .005</u>		
*Grab Sample = One Bucket					
WATER DEPTH (M / FT)	UTM Northing (NAD83)		UTM Easting (NAD83)		
<u>41.7</u>	<u>539061</u>		<u>418463</u>		
LOCATION - STATION NO. - GRAB NO.					

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Black</u>	<u>10 YR 2, 1</u>	<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures	
Color (Munsell)	<u>Dark brown</u>	<u>10 YR 4, 3</u>	Matrix Color / Grain Size Notes: <u>Silt over mixed sand matrix</u>		
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Stems, sticks</u>		
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:	Sampler Penetration: <u>15-20</u> cm		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Woody debris, sticks & branches limit closure, located @ surface

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Dark brown silt over black sands, some yellowish brown sand grains (poorly graded). Sampler is draining. Attempt 3 grabs to get 1/3 bucket, approx 2 gallons. Con time for 3 addl. grabs w/ no success.

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-23-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 092-095

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 6 1 23 /2010

Time: 11:35

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



**FIELD SAMPLE LOG - SEDIMENTS**  
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June 2010

Sample No. : **SD00** 02      Sample Tag : **T** 016

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport      LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>006</u>		SAMPLE IDENTIFIER <u>LMF. 02. 006</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT)		UTM Northing (NAD83)		UTM Easting (NAD83)	
<u>42.8</u>		<u>5390166</u>		<u>418473</u>	

**PHYSICAL CHARACTERISTICS**

<input type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Black</u> <u>10 YR 2, 1</u>		<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) <u>Dark brown</u> <u>10 YR 4, 3</u>		Matrix Color / Grain Size Notes: <u>Silt over mixed sand matrix, poorly graded</u>
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: <u>see below</u>		Sampler Penetration: <u>-0-</u> cm <u>Mixed Depth</u>
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Woody debris prevalent - branches @ surface & near surface

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

**Other Notes:**

Predominate black sands w/ yellow grains mixed, poorly graded. Unable to close sampler, continue until refusal for station per SOP-4. > 3 attempts.

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>No photo</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>No photo</u>

Sampler Name: Jeff Loppo  
 Sample Signature: [Signature]  
 Date: 6/12/2010  
 Time: 11:45

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LMF-03

June 2010

Sample No. : SD00 03

Sample Tag : T 021

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	<b>LMF</b>	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>001</u>		SAMPLE IDENTIFIER <u>LMF . 03 . 001</u>		
*Grab Sample = One Bucket			LOCATION - STATION NO. - GRAB NO.		
WATER DEPTH (M / FT)	UTM Northing (NAD83)		UTM Easting (NAD83)		
<u>28.9</u>	<u>5389419</u>		<u>418537</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Dark yellowish brown 10 YR 4/6</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	<u>Dark grayish brown 10 YR 4/2</u>			Matrix Color / Grain Size Notes: <u>Silt over GW, variable color matrix</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Wood debris, sticks</u>		Sampler Penetration: <u>10-15 cm</u>	
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Wood debris on surface. Dimensional lumber piece - cedar?

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No  NPS  
(Please refer to URS archaeologist field monitoring notes) Checked lumber lathe - not artifact, confirmed by Jim Retzer

Other Notes:

Matrix is yellowish brown silt over sand-gravel mixture, color dependent on parent materials for coarse materials. Frequent cobbles & ~~pebbles~~ gravels limit sample collection - unable to close sampler. Collected enough for one (1) 5 gallon bucket. Attempts approx 3 & 4.

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-23-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 096-109

Sampler Name: Jeff Lapp

Sample Signature: [Signature]

Date: 6/23 /2010

Time: 13:25

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

June 2010

LMF-03

Sample No. : SD00 03 Sample Tag : T 022

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input checked="" type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>002</u>		SAMPLE IDENTIFIER <u>LMF-03-002</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT) <u>27.5</u>		UTM Northing (NAD83) <u>5389405</u>		UTM Easting (NAD83) <u>418541</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Dark yellowish brown 10 YR 4/6</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	<u>Dark grayish brown 10 YR 4/2</u>			Matrix Color / Grain Size Notes: <u>Silt over gravels, w/ variable coarse materials</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Wood debris</u>		Sampler Penetration: <u>-0-</u> cm	
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Wood debris present on surface & rear surface - branches, stems

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Gravels and cobbles prevent sampler closing & samples per SOP-4  
Continue w/ attempts from T021; total of approx 4 for this  
grab. Rejection on LMF-03

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-23-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 110-112

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 6/23 /2010

Time: 13:40

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-01

June 2010

Sample No. : SD00 04

Sample Tag : T 031

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>001</u>		SAMPLE IDENTIFIER <u>UMF. 01. 001</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M) / (FT) <u>29.3</u>		UTM Northing (NAD83) <u>5391679</u>		UTM Easting (NAD83) <u>422645</u>	

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray 10 YR 3, 1</u>		<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) <u>Yellowish brown 10 YR 5, 4</u>		Matrix Color / Grain Size Notes: <u>3-4 cm thin horizon of silt over well-graded sands</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Decomposing organic matter</u>		Sampler Penetration: <u>20</u> cm
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Fine wood debris, roots, stems, bark, mixed in upper profile, more decomposition apparent w/ depth? Freshwater clam.

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Some silt mixed in profile, minor accumulation in upper profile (mixed)  
Mixed sand parent material - black sand w/ yellowish brown medium  
+ coarse sands, salt & pepper effect. Overall color very dark gray  
Predominate sands.

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6.24-10</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>161-167</u>

Sampler Name: Jeff Leggo  
Sample Signature: [Signature]  
Date: 6/24 / 2010  
Time: 12:10

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)





FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-01  
June 2010

Sample No. : SD00 04

Sample Tag : T 032

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>002</u>		SAMPLE IDENTIFIER <u>UMF . 01 . 002</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH <u>29.4</u> (M/FT)		UTM Northing (NAD83) <u>5391680</u>		UTM Easting (NAD83) <u>422648</u>	

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark gray</u>	10 YR	<u>3.1</u>	<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)		YR	<u>1</u>	Matrix Color / Grain Size Notes: <u>Mixed sand materials</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Some decomposing organic matter</u>		
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:	Sampler Penetration: <u>20</u> cm		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Small wood debris - stems, bark (decomposing), litter

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Silt content in upper profile varied (9%)

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-10</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>168-169</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6/24 /2010  
Time: 12:20

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-01

June 2010

Sample No. : SD00 ~~0~~ 4 900r

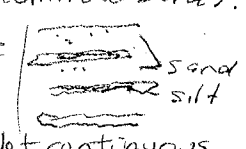
Sample Tag : T 0 3 3

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>003</u>			SAMPLE IDENTIFIER <u>UMF . 01 . 003</u>		
*Grab Sample = One Bucket			LOCATION - STATION NO. - GRAB NO.		
WATER DEPTH	(M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)		
<u>29.3</u>		<u>5391675</u>	<u>422647</u>		

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <sup>Soil</sup>	<u>Very dark gray</u>	<u>10 YR 3, 1</u>	Matrix Color / Grain Size Notes: <u>mixed parent material</u>		
Color (Munsell) <sup>Silt</sup>	<u>Yellowish brown</u>	<u>10 YR 5, 4</u>			
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Decomposing organic matter/litter</u>		
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:	Sampler Penetration: <u>20</u> cm		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>Decaying/decomposing bark/stems</u>					

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Silt layers w/in sand profile, content varies. Predominate sands. Particle size relatively homogenous, layered by texture  
Overall mixed color is very dark gray  


Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-10</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>170-172</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6/24 /2010  
Time: 12:40

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME- SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-01

June 2010

Sample No. : SD00 04

Sample Tag : T 034

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>004</u>		SAMPLE IDENTIFIER <u>UMF_01_004</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT) <u>29.4</u>		UTM Northing (NAD83) <u>5391679</u>		UTM Easting (NAD83) <u>422645</u>	

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray</u>	<u>10 YR 3, 1</u>	<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures	Matrix Color / Grain Size Notes:	
Color (Munsell) <u>silt -&gt; yellowish brown</u>	<u>10 YR 5, 4</u>				
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Litter, debris</u>		
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:	Sampler Penetration: <u>20</u> cm		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Decomposing litter & organic matter

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Silt layered/mixed w/ profile, discontinuous - difficult to determine in situ the % silt & profile - cover.

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-24-10

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 173-176

Sampler Name: Jeff Leggo

Sample Signature: [Signature]

Date: 6, 24 / 2010

Time: 12:50

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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UMF-01  
June 2010

Sample No. : SD00 04 Sample Tag : T 035

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 005 SAMPLE IDENTIFIER UMF. 01 . 005  
\*Grab Sample = One Bucket  
LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>29.2</u>	<u>5<sup>900</sup>391679</u>	<u>422645</u>

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray</u> <u>10</u> YR <u>3, 1</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR <u>1</u>	Matrix Color / Grain Size Notes: <u>Mixed parent material</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Litter, debris</u>		
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		Sampler Penetration: <u>20</u> cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Some Organic litter, decomposing bark, etc. Freshwater clam.

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
less silt w/ this grab sample. Salt pepper sands, well graded

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-10</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>177-180</u>

Sampler Name: Jeff Lepp  
Sample Signature: [Signature]  
Date: 6, 24 /2010  
Time: 13:00

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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UMF-01  
June 2010

Sample No. : SD00 04

Sample Tag : T 036

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 006 SAMPLE IDENTIFIER UMF. 01. 006  
\*Grab Sample = One Bucket  
LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>29.1</u>	<u>5391678</u>	<u>422645</u>

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray</u> <u>10 YR 3, 2</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____ YR _____		Matrix Color / Grain Size Notes: <u>Mixed parent material</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Decomposing organic matter</u>		
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: _____		Sampler Penetration: <u>20</u> cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Organic matter, w/ roots, bark, stems

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Salt & pepper sand mixture, well graded

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>181-182</u>

Sampler Name: Jeff Berro  
Sample Signature: [Signature]  
Date: 6/24 / 2010  
Time: 13:15

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-01  
June 2010

Sample No. : SD00 04

Sample Tag : T 037

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	<u>UMF</u>	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 007 SAMPLE IDENTIFIER UM . 01 . 007  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>29.1</u>	<u>5391689</u> <sup>7 Above</sup>	<u>422644</u>

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark grayish brown</u> <u>10 YR 3, 2</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____ YR _____		Matrix Color / Grain Size Notes: <u>Mixed parent material</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Few, fine organic litter</u>		
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: _____		Sampler Penetration: <u>20</u> cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Decomposing organic litter / matter

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Less silt w/ this sample. Black Dark fine sands mixed w/ yellowish brown sands (medium, coarse), salt and pepper appearance

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6_24_2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>183-184</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 24 / 2010  
Time: 13:45

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-01  
June 2010

Sample No. : SD00 04 Sample Tag : T 038

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)*	<u>008</u>	SAMPLE IDENTIFIER	<u>UMF - 01 - 008</u>
*Grab Sample = One Bucket		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)	
<u>29.2</u>	<u>5391678</u>	<u>422643</u>	

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grayish brown 10 YR 3, 2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR 1			Matrix Color / Grain Size Notes: <u>Mixed parent material</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Few materials</u>		Sampler Penetration: <u>20</u> cm	
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Limited Debris - small leaves, stems, bark

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Silt content, profile still variable. Sands well graded

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>185-187</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6/24 /2010  
Time: 14 : 00

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-01

June 2010

Sample No. : SD00 04

Sample Tag : T 039

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>009</u>		SAMPLE IDENTIFIER <u>UMF-01-009</u>			
*Grab Sample = One Bucket		LOCATION - STATION NO. - GRAB NO.			
WATER DEPTH	<u>29.2</u> (M) / FT	UTM Northing (NAD83)	UTM Easting (NAD83)		
		<u>5391679</u>	<u>422646</u>		

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> <b>SW</b>	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b>	Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b>	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b>	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b>	Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b>	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b>	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b>	Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b>	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark greyish brown 10 YR 3/2</u>			<input type="checkbox"/> <b>GC</b>	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR 1			Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Decomposing litter</u>		<u>Mixed parent material</u>	
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:		Sampler Penetration: <u>20</u> cm	

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Debris litter, scattered & few

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel

Cultural Resources Observed: Yes  No

Other Notes:

Variable silt content. Well graded sands

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-24-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 188-189

Sampler Name: Jeff Gero

Sample Signature: [Signature]

Date: 6, 24 /2010

Time: 14 : 15

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)





FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-01  
June 2010

Sample No. : SD00 04

Sample Tag : T 040

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 010 SAMPLE IDENTIFIER UMF . 01 . 010  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>29.0</u>	<u>5391677</u>	<u>422643</u>

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray to brown 10YR 3, 2</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____	YR <u>1</u>	Matrix Color / Grain Size Notes: <u>Mixed parent material</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Limited org. litter</u>		Sampler Penetration: <u>20</u> cm
Odors Yes <input type="checkbox"/> No <input type="checkbox"/> Description: _____		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Decomposing organic litter - limited

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Variable silt content, settles out when placed into lexan tub

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>190-191</u>

Sampler Name: Jeff Loppo  
Sample Signature: [Signature]  
Date: 6/24 /2010  
Time: 14:20

Sample Labeling (Refer to QAPP and Sample Key)  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-02

June 2010

Sample No. : SD00 05

Sample Tag : T 041

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>001</u>		SAMPLE IDENTIFIER <u>UMF . 02 . 001</u>		
*Grab Sample = One Bucket			LOCATION - STATION NO. - GRAB NO.		
WATER DEPTH (M / FT)	UTM Northing (NAD83)		UTM Easting (NAD83)		
<u>10.7</u>	<u>5390649</u>		<u>420597</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>very dark grayish brown<sup>10</sup> YR 3, 2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR 1			Matrix Color / Grain Size Notes: <u>Relatively uniform</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Some decomposed organics Some grass/vegetation</u>		
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:	<u>None (musky?)</u>		
				Sampler Penetration:	<u>15-20 cm</u>

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Grasses/vegetation @ surface - few strands green/live; red leech observed

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel

Cultural Resources Observed: Yes  No

Other Notes:

Silt matrix, very fine sands (ML).

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-23-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 125-128

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 6, 23 / 2010

Time: 16:05

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-02

June 2010

Sample No. : SD00 05 Sample Tag : T 042

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>002</u>		SAMPLE IDENTIFIER <u>UMF.02.002</u>		
*Grab Sample = One Bucket					
WATER DEPTH (M / FT)	UTM Northing (NAD83)		UTM Easting (NAD83)		
<u>10.6</u>	<u>5390654</u>		<u>420588</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grayish brown 10 YR 3, 2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)				Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Decomposing organic matter Grass/vegetation (limited)</u>		
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:	Sampler Penetration: <u>15-20 cm</u>		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Red leeches, small grasses/vegetation 7 to 10 cm lengths (few)

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-23-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>129-132</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 23 /2010  
Time: 16:15

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-02

June 2010

Sample No. : SD00 05

Sample Tag : T 043

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>003</u>		SAMPLE IDENTIFIER <u>UMF. 02. 003</u>		
*Grab Sample = One Bucket			LOCATION - STATION NO. - GRAB NO.		
WATER DEPTH	(M) / FT	UTM Northing (NAD83)	UTM Easting (NAD83)		
<u>10.5</u>		<u>5390653</u>	<u>420588</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grayish brown 10 YR 3/2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)				Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>small short grasses about 10-30mm 12cm</u>		
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Slight sewage/sulfur odor</u>		
Obvious Abnormalities (wood, shells, organisms, etc):				Sampler Penetration:	<u>15-20 cm</u>
				Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:

Short grasses, sparse growth on sediment surface can be seen in sampler

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-24-10

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 137-141

Sampler Name: Jest Logo

Sample Signature: [Signature]

Date: 6, 24 2010

Time: 10:00

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-02

June 2010

Sample No. : SD00 05

Sample Tag : T 04 ~~34~~ 94

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>004</u>		SAMPLE IDENTIFIER	<u>UMF . 004 . 004</u>	
*Grab Sample = One Bucket			LOCATION - STATION NO. - GRAB NO.		
WATER DEPTH (M / FT)	UTM Northing (NAD83)		UTM Easting (NAD83)		
<u>10.5</u>	<u>5390648</u>		<u>42093</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grayish brown 10 YR 3, 1, 2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR 1			Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Short crosses sparse on surface in sampler</u>		
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>light sulfur</u>		
				Sampler Penetration:	<u>20</u> cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Silt material has blocky consistency/structure

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-24-10

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 142-145

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 6, 24 /2010

Time: 10:10

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-02

June 2010

Sample No. : SD00 05

Sample Tag : T 045

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>005</u>		SAMPLE IDENTIFIER <u>UMF - 02 - 005</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT)		UTM Northing (NAD83)		UTM Easting (NAD83)	
<u>10.4</u>		<u>5390651</u>		<u>420589</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark grayish brown 10 YR 3, 2</u>			Color (Munsell)		
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			Description: <u>Short grasses on sediment surface 10-30cm</u>		
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			Description: <u>Slight sulfur odor</u>		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			Sampler Penetration: <u>20</u> cm		

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes: Orange/reddish brown mottling (iron?)

Boat: Palouse (Gravity Environmental) Photo Directory: UCR Sed 6-24-10

Sampler Type: Power Grab (Gravity Environmental) Photo File: 146-148

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 6, 24 /2010

Time: 10 : 20

**Sample Labeling (Refer to QAPP and Sample Key)**

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME- SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-02

June 2010

Sample No. : SD00 05

Sample Tag : T 046

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>006</u>		SAMPLE IDENTIFIER <u>UMF-02-006</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT) <u>10.7</u>		UTM Northing (NAD83) <u>5390648</u>		UTM Easting (NAD83) <u>420587</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark gray, sh brown 10 YR 5/1.6</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	<u>mottles Dark red / yellowish 5 YR 5/6</u>			Matrix Color / Grain Size Notes: <u>Uniform color &amp; texture - some mottling</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Red / short grasses, sparse</u>		
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Slight sulfur odor</u>		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				Sampler Penetration: <u>20</u> cm	
<u>Small, limited wood debris. Decomposed organic matter</u>					

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-10</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>No photo</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6 / 24 / 2010  
Time: 10:30

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME- SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

June 2010

Sample No. : SD00 05

Sample Tag : T 047

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 007 SAMPLE IDENTIFIER UMF . 02 . 007  
\*Grab Sample = One Bucket  
 LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>10.3</u>	<u>5390645</u>	<u>420588</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark grayish brown 10 YR 3 / 2</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) mottles <u>Yellowish red 5 YR 5 / 6</u>		Matrix Color / Grain Size Notes: <u>Uniform color + matrix - some limited mottling</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Short grasses, sparse</u>		Sampler Penetration: <u>20</u> cm
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Slight sulfur odor</u>		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Limited wood debris - small leaves

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-10</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>149-151</u>

Sampler Name: Jelske  
 Sample Signature: [Signature]  
 Date: 6 / 24 /2010  
 Time: 10:35

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)





FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-02

June 2010

Sample No. : SD00 05

Sample Tag : T 048

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>008</u>		SAMPLE IDENTIFIER <u>UMF-02-008</u>		
*Grab Sample = One Bucket					
WATER DEPTH (M / FT)	UTM Northing (NAD83)		UTM Easting (NAD83)		
<u>10.5</u>	<u>5390648</u>		<u>420589</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity.	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grayish brown 10 YR 3/2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR <u>1</u>			Matrix Color / Grain Size Notes: <u>uniform color + matrix</u> <u>no mottles on this grab</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:		Sampler Penetration: <u>20</u> cm	
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>slight sulfur odor</u>			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Red leech/worm

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-10</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>152-153</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 24 /2010  
Time: 10:50

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-02

June 2010

Sample No. : SD00 05

Sample Tag : T 049

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>009</u>		SAMPLE IDENTIFIER <u>UMF . 02 . 009</u>		
*Grab Sample = One Bucket					
WATER DEPTH (M / FT)	UTM Northing (NAD83)		UTM Easting (NAD83)		
<u>10.3</u>	<u>5390652</u>		<u>420590</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grayish brown 10 YR 3/2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	<u>mottles Yellowish red 5/6 YR 5/6</u>			Matrix Color / Grain Size Notes: <u>uniform color matrix w/ red mottling</u>	
Visible Organic Matter	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description: <u>No visible grasses</u>		Sampler Penetration: <u>20</u> cm	
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Slight surface odor</u>			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Limited organics (decomposed that is visible to eye)

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-10</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>154 -158</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 24 /2010  
Time: 11 : 00

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)

UMF-02



**FIELD SAMPLE LOG - SEDIMENTS**  
 Upper Columbia River - White Sturgeon Sediment Toxicity Study  
 United States Locations/Stations

June 2010

Sample No. : SD0005

Sample Tag : T 050

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>010</u>		SAMPLE IDENTIFIER <u>UMF . 02 . 010</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT) <u>10.5</u>		UTM Northing (NAD83) <u>5390654</u>		UTM Easting (NAD83) <u>420587</u>	

**PHYSICAL CHARACTERISTICS**

<input type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark grayish brown 10 YR 3 / 2</u>		<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) <u>Mottled yellowish red 5 YR 5 / 6</u>		Matrix Color / Grain Size Notes: <u>uniform color + texture w/ limited red mottles</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>small short grasses sparse</u>		Sampler Penetration: <u>2.0 cm</u>
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>slight sulfur</u>		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Some limited organic debris / decomposed organic matter

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
 (Please refer to URS archaeologist field monitoring notes)

Other Notes:

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR. Sed 6-24-10

Sampler Type: Power Grab (Gravity Environmental)

Photo File: No photos of sample -> card info only

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 6 / 24 / 2010

Time: 11 : 10

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-03

June 2010

Sample No. : SD00 06

Sample Tag : T 051

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>001</u>		SAMPLE IDENTIFIER <u>UMF . 03 . 001</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT)		UTM Northing (NAD83)		UTM Easting (NAD83)	
<u>16.4</u>		<u>5392081</u>		<u>420020</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark gray 10 YR 3, 1</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR 1			Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>See below</u>		
Odors	Yes <input type="checkbox"/> No <input type="checkbox"/>	Description:	Sampler Penetration: <u>20-25 cm</u>		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Decomposing organic matter, hard to distinguish, black streaking

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

River mud, organic matter decomposition → black streaking or stringers w/in gray silt matrix

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-24-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 195-198

Sampler Name: Jeff Goppo

Sample Signature: [Signature]

Date: 6, 24 / 2010

Time: 15:45

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-03

June 2010

Sample No. : SD00 0869 Jeff

Sample Tag : T 052

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	002		SAMPLE IDENTIFIER <u>LMF . 03 . 002</u>		
*Grab Sample = One Bucket					
WATER DEPTH (M / FT)	18.6		UTM Northing (NAD83)	420021	
			5392083		
				LOCATION - STATION NO. - GRAB NO.	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark gray 10 YR 3 / 1</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR 1			Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Recomposed</u>		
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:	<u>Musky</u>		
			Sampler Penetration: <u>25</u> cm		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Decomposing litter - streaking decayed organic matter layered / streaky in silt

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

River mud, organic matter decaying. No odor of note, musky or mud odor(!)

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-24-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 199-200

Sampler Name: Jeff Loppo

Sample Signature: [Signature]

Date: 6 12 24 /2010

Time: 16 : 00

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME- SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-03

June 2010

Sample No. : SD00 06

Sample Tag : T 0583 *serv*

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>003</u>		SAMPLE IDENTIFIER <u>UMF-03-003</u>		
*Grab Sample = One Bucket					
WATER DEPTH	(M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)		
<u>18.7</u>		<u>5392084</u>	<u>420019</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark gray 10 YR 3, 1</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)				Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Decomposed organic matter</u>		<u>Uniform</u>	
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:		Sampler Penetration: <u>20</u> cm	

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Some litter - very fine stems / roots

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

River mud

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>201-203</u>

Sampler Name: Jeff Lopez  
Sample Signature: [Signature]  
Date: 6, 24 / 2010  
Time: 16:05

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME- SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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UMF-03

June 2010

Sample No. : SD00 06

Sample Tag : T 054

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 004 SAMPLE IDENTIFIER UMF. 03. 004  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>17.9</u>	<u>5392084</u>	<u>420018</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray 10 YR 3.1</u>	<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures	
Color (Munsell) YR <u>1</u>	Matrix Color / Grain Size Notes: <u>Uniform color/texture</u>	
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description:	Sampler Penetration: <u>20-25 cm</u>	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: <u>Musky, river mud</u>		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Some decomposing organic matter, dark/black streaks in silt + Pine needles

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:

Silts - laminated structure in some <sup>power</sup> grabs.

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>204-205</u>

Sampler Name: Jeff Goppo  
Sample Signature: [Signature]  
Date: 6, 24 2010  
Time: 16:15

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-03

June 2010

Sample No. : SD00 06

Sample Tag : T 055

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>005</u>		SAMPLE IDENTIFIER <u>UMF - 03 - 004</u>		
*Grab Sample = One Bucket					
WATER DEPTH (M / FT)	UTM Northing (NAD83)		UTM Easting (NAD83)		
<u>17.7</u>	<u>5392080</u>		<u>420019</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark grey 10 YR 3.1</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)				Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Decomposing pine needles, bark</u>		
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Musky, river mud</u>		
				Sampler Penetration:	<u>2.0</u> cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Dark organic streaking / lamellae.

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Silts, laminated (horizontal) structure evident in some grabs.

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>205-207</u>

Sampler Name: Jeff Lopez  
Sample Signature: [Signature]  
Date: 6, 24 / 2010  
Time: 16:25

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)





FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

UMF-03

June 2010

Sample No. : SD00 06

Sample Tag : T 0 5 6

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 006 SAMPLE IDENTIFIER UMF-03-006  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>18.3</u>	<u>5392082</u>	<u>420017</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray</u> <u>10 YR 3, 1</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____ YR _____		Matrix Color / Grain Size Notes: <u>Uniform color / texture</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Decomposing litter</u>		Sampler Penetration: <u>20</u> cm
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>river mud / musky</u>		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Limited, some organic matter

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:

River mud/silt, dark decomposed organic streaking

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-24-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 208-209

Sampler Name: Jeff Lepp

Sample Signature: [Signature]

Date: 6, 24 /2010

Time: 16:35

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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UMF-03  
June 2010

Sample No. : SD00 06

Sample Tag : T 057

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>007</u>		SAMPLE IDENTIFIER <u>UMF - 03 - 007</u>		
*Grab Sample = One Bucket					
WATER DEPTH (M / FT)	UTM Northing (NAD83)		UTM Easting (NAD83)		
<u>18.7</u>	<u>5392080</u>		<u>420016</u>		

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Very dark gray 10 YR 3/1</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)				Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description: <u>Little to no litter</u> <u>No visible in this sample</u>		<u>Uniform color / texture</u>	
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Musky, river mud</u>		Sampler Penetration: <u>20</u> cm	
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:

Black streaking, lamellae of decomposing organic matter

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>210-211</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 6/24 2010

Time: 16:35

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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UMF-03

June 2010

Sample No. : SD00 06 Sample Tag : T 058

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 008 SAMPLE IDENTIFIER UMF - 03 - 008  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>18.1</u>	<u>5390280</u>	<u>420018</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray 10 YR 3/1</u>	Color (Munsell) YR 1	Matrix Color / Grain Size Notes: <u>Uniform</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Pine needles</u>	Odors Yes <input type="checkbox"/> No <input type="checkbox"/> Description:	Sampler Penetration: <u>20</u> cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Less organic matter on surface

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Black organic matter layered into silts

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>9800 212-213</u>

Sampler Name: Jeff Lopez  
Sample Signature: [Signature]  
Date: 6 / 24 /2010  
Time: 16:45

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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UMF-03

June 2010

Sample No. : SD00 06

Sample Tag : T 059

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 009 SAMPLE IDENTIFIER UMF . 03 . 009  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>18.6</u>	<u>5392080</u> <u>98420027</u>	<u>420016</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray</u>	<u>10 YR 3, 1</u>	Matrix Color / Grain Size Notes: <u>Uniform matrix</u>
Color (Munsell)	<u>YR 1</u>	
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Limited pine needles sticks</u>	Sampler Penetration: <u>20</u> cm
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Musty / river mud</u>	
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:

decomposed River mud, organic matter

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6.24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>214-215</u>

Sampler Name: Jeff Lopez  
Sample Signature: [Signature]  
Date: 6, 24 2010  
Time: 16:50

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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UMF-03

June 2010

Sample No. : SD00 06

Sample Tag : T 060

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input checked="" type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 010 SAMPLE IDENTIFIER UMF. 03. 010  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>18.3</u>	<u>5392080</u>	<u>420014</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray</u> <u>10</u> YR <u>3</u> , <u>1</u>	Color (Munsell) _____	<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Limited litter</u>	Matrix Color / Grain Size Notes: <u>Uniform</u>	
Odors Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Musk, river mud</u>	Sampler Penetration: <u>20</u> cm	

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Pine needles, bark - limited

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Black lamellae/streaks of decayed organic matter

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>216-219</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6/24 /2010  
Time: 16:55

Sample Labeling (Refer to QAPP and Sample Key)  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

CB-01

June 2010

Sample No. : SD00 07

Sample Tag : T 061

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<u>DME</u>	<u>CB</u>	<u>UMF</u>	<u>LMF</u>	
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 001 SAMPLE IDENTIFIER CB . 01 . 001  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>17.2</u>	<u>No GPS / satellites</u>	<u>No GPS / satellites</u>

PHYSICAL CHARACTERISTICS

*- Nobeltec / Buoy*

<input checked="" type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Dark grayish brown</u> <u>10</u> YR <u>3, 2</u>		<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____ YR _____		Matrix Color / Grain Size Notes: <u>Trace sands</u>
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: _____		Sampler Penetration: <u>-0-</u> cm
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: _____		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
*Only trace recovery of sands in attempts. One boulder recovered. Moderate river current and depth limits ability to meet SOP-4. Difficult to determine bottom composition. GPS -> loss of satellites on both units? Use buoy marker & Nobeltec system - Rare orders drop @ control*

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-25-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>247-261</u>

Sampler Name: Jill Lopp  
Sample Signature: [Signature]  
Date: 6/25 /2010  
Time: 13:20

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)

CB-02



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

June 2010

Sample No. : SD00 08 Sample Tag : T 071

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input checked="" type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 001 SAMPLE IDENTIFIER CB.02.001  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>16.4</u>	<u>5408 264</u>	<u>432128</u>

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input checked="" type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Dark grayish brown</u>	<u>10</u> YR <u>3, 2</u>	<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR <u>1</u>	Matrix Color / Grain Size Notes: <u>Sands w/ trace silt</u>
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		Sampler Penetration: <u>-0-</u> cm
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
see Env. Field Handbook for details  
Only partial/trace recovery of seeds in attempts. Refused, with full wash of sample. River current is moderate. Conditions limit competent recovery. Cobble & boulder riverbottom suspected based on near shore composition. Few silts w/ seed (light brown) No Sample

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-25-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>223 - 246</u>

Sampler Name: Jeff Lopp  
Sample Signature: [Signature]  
Date: 6/23 /2010  
Time: 09:50

Sample Labeling (Refer to QAPP and Sample Key)  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

CB-03

No Sample

June 2010

Sample No. : SD00 09

Sample Tag : T 081

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input checked="" type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)*	<u>001</u>		SAMPLE IDENTIFIER <u>CB . 03 . 001</u>		
*Grab Sample = One Bucket					
WATER DEPTH	(M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)		
<u>13.1</u>		<u>5407583</u>	<u>431105</u>		
LOCATION - STATION NO. - GRAB NO.					

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input checked="" type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Dark grayish brown 60 YR 3/2</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR <u>1</u>			Matrix Color / Grain Size Notes: <u>Mixed parent materials present. Dependent</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Tree limbs, decaying organic litter</u>		Sampler Penetration: <u>2-10 cm</u>	
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Small green vegetation (milfoil?) in @ least one grab try.

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:

Several rejections due to cobbles, gravels, tree limbs & organic matter. Sediment matrix is difficult to determine. Increased cobble amounts in some samples. More silts in some grabs. Disturbed samples do not meet SOP4.

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-25-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 264-278

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 6, 25 /2010

Time: 14:10

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120, Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)





FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

DME-01  
~~UMF-02~~

June 2010

Sample No. : SD00 10 Sample Tag : T 091 No Sample

LOCATION NAME	<input checked="" type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<u>DME</u>	CB	UMF	LMF	
STATION NO.	<u>01</u>	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 001 SAMPLE IDENTIFIER DME\_01\_001  
\*Grab Sample = One Bucket

WATER DEPTH 3.5 (M/FT) UTM Northing (NAD83) 5420949 UTM Easting (NAD83) 446396  
LOCATION - STATION NO. - GRAB NO.

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input checked="" type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Variable color matrix</u> YR <u>1</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) YR <u>1</u>		Matrix Color / Grain Size Notes: <u>Mixed parent materials</u>
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		Sampler Penetration: <u>Cannot determine cm Red soil</u>
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
Poor recovery, 1st grab only hand full of sands, mixed colors/matrix. 2nd grab - 1 cobble. 3rd grab - few cobbles. Coarse gravels predominate w/in sample grab, very poor/no recovery due to cobbles.  
No Sample

Boat: Palouse (Gravity Environmental) Photo Directory: UCR Sed 6-26-2010  
Sampler Type: Power Grab (Gravity Environmental) Photo File: 301 - 310

Sampler Name: Jeff Lopez  
Sample Signature: [Signature]  
Date: 6, 26 /2010  
Time: 11:25

Sample Labeling (Refer to QAPP and Sample Key)  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



**FIELD SAMPLE LOG - SEDIMENTS**  
 Upper Columbia River - White Sturgeon Sediment Toxicity Study  
 United States Locations/Stations

DME-02

June 2010

No Sample

Sample No. : **SD00** 11

Sample Tag : **T** 101

LOCATION NAME	<input checked="" type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 001 SAMPLE IDENTIFIER DME-02-001  
 \*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>10.5</u>	<u>5420440</u>	<u>4486803</u>

**PHYSICAL CHARACTERISTICS**

<input type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input checked="" type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Variable color matrix</u> YR <u>1</u>		Matrix Color / Grain Size Notes: <u>Coarse → cobbles</u>
Color (Munsell) YR <u>1</u>		
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		Sampler Penetration: <u>Limited / Refusal</u> cm
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
 (Please refer to URS archaeologist field monitoring notes)

**Other Notes:**

Cobbles of varied / mixed parent materials. Unable to recover competent grab sample. Some mixed sands present. Unable to identify fine-grained materials w/ refusal of Power Grab sampler  
 No Sample

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-26-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>293-298</u>

Sampler Name: Jeff Green  
 Sample Signature: [Signature]  
 Date: 6, 26 / 2010  
 Time: 10:55  
11 [Signature]

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

No Sample

DME-03

June 2010

Sample No. : SD00 12

Sample Tag : T 111

LOCATION NAME	<input checked="" type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03		NP = Northport LD = Lower Dalles

GRAB SAMPLE NO. (001 THROUGH 010)* <u>001</u>	SAMPLE IDENTIFIER <u>DME . 03 . 001</u>
*Grab Sample = One Bucket	
LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH <u>5.5</u> (M) FT	UTM Northing (NAD83) <u>5420745</u>
	UTM Easting (NAD83) <u>446282</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input checked="" type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>Variable color matrix</u> YR <u>1</u>			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR <u>1</u>			Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:		Sampler Penetration: <u>0</u> cm	
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:			
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
No recovery. Power Grabs unable to recover any sediments, or other materials. Solid bottom, boulders? 4 Attempts.  
No Sample

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-26-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>311-320</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6/20 /2010  
Time: 13:25

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



**FIELD SAMPLE LOG - SEDIMENTS**  
 Upper Columbia River - White Sturgeon Sediment Toxicity Study  
 United States Locations/Stations

NP-01

June 2010

No Sample

Sample No. : SD00 16

Sample Tag : T 151

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	NP
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>001</u>		SAMPLE IDENTIFIER <u>NP-01-001</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH <u>8.5</u> (M/ FT)		UTM Northing (NAD83) <u>5419144</u>		UTM Easting (NAD83) <u>443440</u>	

PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>sand's Black 10 YR 2/1</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) <u>w/ Yellowishbrown 10 YR 5/6</u>		Matrix Color / Grain Size Notes: <u>Variable mixed matrix Parent material</u>
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		Sampler Penetration: <u>10</u> cm
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
 (Please refer to URS archaeologist field monitoring notes)

Other Notes:  
 Mixed parent materials, predominate black sands, few gravels. Collect 1 sample/grab, shallow but competent. Subsequent samples 5 failures/refusals. No sample recovery for station. Cobble to boulder-sized materials predominate.

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>356-367</u>

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 6, 27 /2010  
 Time: 11:15

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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No Sample

NP-02

June 2010

Sample No. : SD00 17

Sample Tag : T 161

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03		NP = Northport Lower Dalles LD =

GRAB SAMPLE NO. (001 THROUGH 010)\* 001 SAMPLE IDENTIFIER NP . 02 . 001  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH	(M/FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>∞ 5m</u>	<u>Varies 3+7 meters on parameter</u>	<u>5419836</u>	<u>444101</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>3 beds Variable color matrix</u>	<u>10 YR 3, 2</u>		<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	<u>Dark yellowish brown</u>	<u>10 YR 4, 4</u>		Matrix Color / Grain Size Notes: <u>Mixed parent materials for sand</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description:	<u>Few grass or vegetation blades</u>		
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:	Sampler Penetration: <u>-0-</u> cm		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:  
Large boulders and bedrock exposures visible on-shore and in river @ visible depths. Refusal. Limited sand recovery with only skim/thin layer within grabs - trace sands suspected between boulders to outcrop. Refusal, no competent sample.

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>Sed UCR 6-27-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>323-336</u>

Sampler Name: Jeff Leggo  
Sample Signature: [Signature]  
Date: 6 1 27 / 2010  
Time: 08:55

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME- SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)

NP-03



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

June 2010

Sample No. : SD00 18 Sample Tag : T 171

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03		NP = Northport Lower Dalles LD =
GRAB SAMPLE NO. (001 THROUGH 010)* <u>001</u>		SAMPLE IDENTIFIER <u>NP . 03 . 001</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT) <u>5.3</u>		UTM Northing (NAD83) <u>5419370</u>		UTM Easting (NAD83) <u>443303</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>scs Dark brown</u>			10 YR 4, 3		
Color (Munsell)			YR 1		
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: <u>Short grasses, few</u>		Matrix Color / Grain Size Notes: <u>Mixed colors and parent materials for gravels</u>	
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:		Sampler Penetration: <u>5-10</u> cm	
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:  
Dark brown sands are poorly graded. Variable recovery success, few rejections (2) are to gravels blocking grab sampler, clamshells. Fine to medium sands. Few fine & medium gravels. Difficult to determine sampler penetration due to variable recovery.

Boat: Palouse (Gravity Environmental) Photo Directory: UCR Sed 6-27-2010  
Sampler Type: Power Grab (Gravity Environmental) Photo File: 337-343

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 27 / 2010  
Time: 09:20

Sample Labeling (Refer to QAPP and Sample Key)  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

June 2010

Sample No. : SD00 18

Sample Tag : T 172

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	NP-03
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03		NP = Northport LD = Lower Dalles

GRAB SAMPLE NO. (001 THROUGH 010)\* 002 SAMPLE IDENTIFIER NP - 03 - 002

WATER DEPTH <sup>Estimate</sup> (M) (FT)	UTM Northing (NAD83)	LOCATION - STATION NO. - GRAB NO.
<u>3-5 (Boat in reverse no reading)</u>	<u>5419368</u>	<u>NP-03-002</u>
		UTM Easting (NAD83) <u>39805</u> <u>44305</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <sup>sands</sup> <u>Dark brown</u> <u>10</u> YR <u>4, 3</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) YR <u>1</u>		Matrix Color / Grain Size Notes: <u>Mixed colors &amp; parent materials for gravels</u>
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		Sampler Penetration: <u>20</u> cm
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Other Notes:  
Good recovery, poorly graded fine to medium sands. Few fine to medium gravels of mixed colors & parent materials  
Some gravels present. Sand texture and colors are relatively uniform dark brown

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-27-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>344-347</u>

Sampler Name: Jeff Lappo  
Sample Signature: [Signature]  
Date: 6, 27 / 2010  
Time: 09:50

Sample Labeling (Refer to QAPP and Sample Key)  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

NP-03

June 2010

Sample No. : SD00 18 Sample Tag : T 173

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	NP
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 003 SAMPLE IDENTIFIER NP. 03. 003  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH	(M/FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>5</u>		<u>5419363</u>	<u>743309</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>sands Dark brown</u>	<u>10</u>	<u>YR 4.3</u>	<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)		<u>YR</u>	<u>1</u>	Matrix Color / Grain Size Notes: <u>Serests in unconf. Gravels of varying colors / percent materials</u>	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/>	Description: <u>See below</u>		Sampler Penetration: <u>15</u> cm	
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Few woody debris, fine to medium bank/litter

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
1 to 2 refusals per grab, either gravel in clam shell or poor recovery, with stomach washing

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-24-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>348-350</u>

Sampler Name: Jeff Hepp  
Sample Signature: [Signature]  
Date: 6 127 /2010  
Time: 10:10

Sample Labeling (Refer to QAPP and Sample Key)  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



NP-03



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

June 2010

Sample No. : SD00 18

Sample Tag : T 174

No Sample

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	NP
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)*	<u>004</u>	SAMPLE IDENTIFIER	<u>NP . 03 . 004</u>
*Grab Sample = One Bucket		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH	<u>5.5</u> (M/FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
		<u>5419362</u>	<u>443306</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	<u>sands Dark brown</u>		<u>10 YR 4, 3</u>	<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)			<u>YR 1</u>	Matrix Color / Grain Size Notes: <u>Sands relatively uniform. Gravels are varied in color size + parent material</u>	
Visible Organic Matter	Yes <input type="checkbox"/> No <input type="checkbox"/>	Description:		Sampler Penetration: <u>20</u> cm	
Odors	Yes <input type="checkbox"/> No <input type="checkbox"/>	Description:			

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Fine fine to medium root, litter, bark mixed w/ sands

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes)

Other Notes:  
5 ~~3~~ refusals - washed on gravel holding clam shell open. No to little recovery. Does not meet SOP.  
AJers  
No Sample

Boat: Palouse (Gravity Environmental) Photo Directory: UCR Sed 6-24-2010  
Sampler Type: Power Grab (Gravity Environmental) Photo File: 351-354

Sampler Name: Jeff Lepp  
Sample Signature: [Signature]  
Date: 6, 27 /2010  
Time: 10:30

Sample Labeling (Refer to QAPP and Sample Key)  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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LD-01

June 2010

Sample No. : **SD00** 13 Sample Tag : **T** 121

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	<b>LD</b>
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* <u>001</u>		SAMPLE IDENTIFIER <u>LD . 01 . 001</u>		LOCATION - STATION NO. - GRAB NO.	
WATER DEPTH (M / FT) <u>23.0</u>		UTM Northing (NAD83) <u>5412550</u>		UTM Easting (NAD83) <u>435422</u>	

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Black</u>	<u>10 YR 2 / 1</u>	Matrix Color / Grain Size Notes: <u>Uniform texture/color</u>
Color (Munsell)	<u>YR</u>	
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> <u>AK</u> Description: <u>small organic litter</u>		Sampler Penetration: <u>20</u> cm
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Few small shells - white 5 to 15mm. Misc. organic litter (mostly decomposing)

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Michele Stegner AK

Other Notes:

Good recovery. Predominately fine black sand. Small volume composition of yellowish brown sand grains.

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-27-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 404-408

Sampler Name: Jeff Lopez

Sample Signature: AK

Date: 6, 27 / 2010

Time: 14:35

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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LD-01

June 2010

Sample No. : SD00 13 Sample Tag : T 122

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	<b>LD</b>
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 002 SAMPLE IDENTIFIER LD . 01 . 002  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>21.1</u>	<u>5412543</u>	<u>435424</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Black</u>	<u>10 YR 2, 1</u>	<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____	YR _____	Matrix Color / Grain Size Notes: <u>Uniform texture/color</u>
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description: _____	Sampler Penetration: <u>20</u> cm
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description: _____	

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Few small shells (snails) - white 5 to 10mm. Misc. decomposing organic matter.

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes) Michelle Stegner Ed

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-27-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>409-411</u>

Sampler Name: Jeff Lopp  
Sample Signature: Jeff Lopp  
Date: 6, 27 /2010  
Time: 14:45

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
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LD-01

June 2010

Sample No. : SD00 13 Sample Tag : T 1 2 3

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	LD
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 003 SAMPLE IDENTIFIER LD . 01 . 003  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>214</u>	<u>5412548</u>	<u>435425</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Black</u>	<u>10 YR 2, 1</u>	Matrix Color / Grain Size Notes: <u>Uniform texture/color</u>
Color (Munsell)	<u>YR 1</u>	
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Organic litter</u>	Sampler Penetration: <u>20</u> cm	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Misc. decomposing litter / organic matter.

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes) Michelle Stagner

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6.27.2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>412-413</u>

Sampler Name: Jeff Lepo  
Sample Signature: [Signature]  
Date: 6, 27 / 2010  
Time: 14:50

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME- SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)

LD-01



FIELD SAMPLE LOG - SEDIMENTS
Upper Columbia River - White Sturgeon Sediment Toxicity Study
United States Locations/Stations

June 2010

Sample No. : SD001 3

Sample Tag : T 124

Table with 6 columns: LOCATION NAME, LOCATION CODE, STATION NO., LOCATION NAME, LOCATION CODE, STATION NO. Includes checkboxes for Deadman's Eddy, China Bend, Upper Marcus Flats, Lower Marcus Flats, and Alternate.

GRAB SAMPLE NO. (001 THROUGH 010)\* 004 SAMPLE IDENTIFIER LD.01.004
\*Grab Sample = One Bucket
LOCATION - STATION NO. - GRAB NO.

Table with 3 columns: WATER DEPTH (21.0 m), UTM Northing (5412545), UTM Easting (435434)

PHYSICAL CHARACTERISTICS

Table with 3 columns: Soil types (SW, SP, ML, SM, SC, CL, GW, GP, GM, GC) and other characteristics (Color, Visible Organic Matter, Odors, Sampler Penetration).

Obvious Abnormalities (wood, shells, organisms, etc): Yes [checked] No [ ]
Decomposing bark, wood debris. Small snails/shells, some appear to be white.

Cultural Resources Notes: URS Archaeologist - Mike Kelly [ ] / Sarah McDaniel [ ]
Cultural Resources Observed: Yes [ ] No [checked]
Michele Stegner [checked]

Other Notes:
Continues to include small amounts of yellowish brown/brownish yellow sand grains.

Table with 2 columns: Boat: Palouse (Gravity Environmental), Photo Directory: UCR Sed 6-27-2010; Sampler Type: Power Grab (Gravity Environmental), Photo File: 414-420

Sampler Name: Jeff Lopez
Sample Signature: [Signature]
Date: 6/27/2010
Time: 15:35

Sample Labeling (Refer to QAPP and Sample Key)
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.
Grab Sample No. Example - 001 through 010 (10 per station)



**FIELD SAMPLE LOG - SEDIMENTS**  
 Upper Columbia River - White Sturgeon Sediment Toxicity Study  
 United States Locations/Stations

LD-01  
 June 2010

Sample No. : SD0013

Sample Tag : T 125

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	<b>LD</b>
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 005 SAMPLE IDENTIFIER LD . 01 . 005  
 \*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>22.0</u>	<u>5412540</u>	<u>435423</u>

**PHYSICAL CHARACTERISTICS**

<input type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Black</u> <u>10</u> YR <u>2</u> 1	<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures	
Color (Munsell) _____ YR _____	Matrix Color / Grain Size Notes:	
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Misc. organic litter</u>	Sampler Penetration: <u>20</u> cm	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: _____	Obvious Abnormalities (wood, shells, organisms, etc): Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>Decomposing bark, etc.</u>	

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
 (Please refer to URS archaeologist field monitoring notes) Michele Stegner

Other Notes:  
Some rejected material grabs due to bark or limbs holdy open sampler clam shell sides.

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6.27.2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>421-422</u>

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 6/27 /2010  
 Time: 15:53

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LD-01

June 2010

Sample No. : SD00 13

Sample Tag : T 126

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	LD
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 006 SAMPLE IDENTIFIER LD.01.006  
\*Grab Sample = One Bucket  
LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>22m</u>	<u>5412550</u>	<u>435464</u> No Reading GPS Lost signal

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Black</u> <u>10</u> YR <u>2</u> / <u>1</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____ YR _____		Matrix Color / Grain Size Notes:
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Organic litter, decomposing</u>		
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: _____		Sampler Penetration: <u>20</u> cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Small snails present

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

(Please refer to URS archaeologist field monitoring notes) Michele Stegner

Other Notes:

Old athletic shoe in sample - rejected for one grab - held open sampler

Boat: Palouse (Gravity Environmental)

Photo Directory: UCR Sed 6-27-2010

Sampler Type: Power Grab (Gravity Environmental)

Photo File: 423-425

Sampler Name: Jeff Jepsen

Sample Signature: [Signature]

Date: 6/27/2010

Time: 15:59

Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)

LD-01



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

June 2010

Sample No. : SD00 13

Sample Tag : T 127

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	<u>LD</u>
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 007 SAMPLE IDENTIFIER \_\_\_\_\_  
 \*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO. \_\_\_\_\_

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>21.6</u>	<u>5412541</u>	<u>435422</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Black</u>	<u>10 YR 2/1</u>	<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____	YR _____	Matrix Color / Grain Size Notes: <u>Uniform color/texture</u>
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Organic litter on surface</u>	Sampler Penetration: <u>20</u> cm	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: _____		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Few Snail shells, 5 to 10 mm

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No

Michelle Stegner

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-27-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>426-428</u>

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 6, 27 /2010  
 Time: 16:12

**Sample Labeling (Refer to QAPP and Sample Key)**  
 Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
 Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
 Grab Sample No. Example - 001 through 010 (10 per station)





FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LD-01

June 2010

Sample No. : SD00 13

Sample Tag : T 128

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	<u>DME</u>	<u>CB</u>	<u>UMF</u>	<u>LMF</u>	<u>LD</u>
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 008 SAMPLE IDENTIFIER LD-01-008  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>21.7</u>	<u>5412561</u>	<u>435421</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Black</u> <u>10</u> YR <u>2, 1</u>	Matrix Color / Grain Size Notes:	
Color (Munsell) _____ YR _____	<u>Uniform color/texture</u>	
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>Dark organic matter</u>	Sampler Penetration: <u>20</u> cm	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description: _____		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Small snails/shells present - appear to be on sediment surface

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes) Nichole Stegner

Other Notes:  
Small amounts of brownish yellow sand grains in matrix - present in all grabs.

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-27-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>429-432</u>

Sampler Name: Jeff Loppo  
Sample Signature: [Signature]  
Date: 6, 27 /2010  
Time: 16:47:5

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LD-01

June 2010

Sample No. : SD00 13 Sample Tag : T 129

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	LD
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 009 SAMPLE IDENTIFIER LD . 01 . 009  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M / FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>20</u>	<u>5412444</u> <sup>5</sup> <i>Jeff</i>	<u>435423</u> <sup>5</sup> <i>Jeff</i>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Black</u> <u>10</u> YR <u>2</u> , <u>1</u>	Matrix Color / Grain Size Notes:	
Color (Munsell) _____ YR _____	<u>uniform texture/color</u>	
Visible Organic Matter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Description: <u>organic matter - bark</u>	Sampler Penetration: <u>20</u> cm	
Odors Yes <input type="checkbox"/> No <input type="checkbox"/> Description: _____		

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No   
Small white to yellowishwhite snails on sediment surface

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
Michele Stegner

Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-27-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>433 - 439</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 27 /2010  
Time: 16:50

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)

LD-01



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

June 2010

Sample No. : SD00 13

Sample Tag : T 30

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	LD
STATION NO.	<input checked="" type="checkbox"/> 01	<input type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	
GRAB SAMPLE NO. (001 THROUGH 010)* 010		SAMPLE IDENTIFIER		LD . 01 . 010	
*Grab Sample = One Bucket		LOCATION - STATION NO. - GRAB NO.			
WATER DEPTH (M / FT)	20.0	UTM Northing (NAD83)	5412553		
		UTM Easting (NAD83)		435421	

## PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW	Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM	Silty sands, sand-silt mixtures	<input type="checkbox"/> GW	Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP	Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP	Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML	Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL	Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM	Silty gravels, gravel-sand-silt mixtures
Color (Munsell)	Black 10 YR 2/1			<input type="checkbox"/> GC	Clayey gravels, gravel-sand-clay mixtures
Color (Munsell)	YR 1			Matrix Color / Grain Size Notes:	
Visible Organic Matter	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Description: Organic litter - bark		Uniform texture/color	
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description:		Sampler Penetration: 20 cm	
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input type="checkbox"/>					
Small snails present - number & sizes vary from grabs to grab					

Cultural Resources Notes: URS Archaeologist - Mike Kelly  Sarah McDaniel  Cultural Resources Observed: Yes  No

(Please refer to URS archaeologist field monitoring notes)

Michele Stegner

## Other Notes:

Boat: Palouse (Gravity Environmental)	Photo Directory: UCR Sed 6-27-2010
Sampler Type: Power Grab (Gravity Environmental)	Photo File: 440-443

Sampler Name: Jeff Leggo

Sample Signature: [Signature]

Date: 6/27/2010

Time: 16:57

## Sample Labeling (Refer to QAPP and Sample Key)

Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)

Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.

Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

LD-02  
No Sample June 2010

Sample No. : **SD00** / 4 Sample Tag : **T** 131

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	<b>DME</b>	<b>CB</b>	<b>UMF</b>	<b>LMF</b>	<b>LD</b>
STATION NO.	<input type="checkbox"/> 01	<input checked="" type="checkbox"/> 02	<input type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 001 SAMPLE IDENTIFIER LD . 02 . 001  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M/FT) 22.5 UTM Northing (NAD83) 5413586 UTM Easting (NAD83) 436598

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Mixed variable colors</u> YR <u>1</u>	<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures	
Color (Munsell) <u>Sands SW Very dark grayish brown / Or 3, 2</u>	Matrix Color / Grain Size Notes: <u>Mixed parent materials</u>	
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Sampler Penetration: <u>0</u> cm	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes) Michele Stegner

Other Notes:  
Gravel to cobble sized materials of mixed parent materials. Limited volume of well graded sands, cannot determine composition % tage. All 3 attempts have gravels & cobbles. Sand w/ gravel & cobbles appears well graded. No sample

Boat: Palouse (Gravity Environmental) Photo Directory: UCR Sed 6-27-2010  
Sampler Type: Power Grab (Gravity Environmental) Photo File: 383-396

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 6, 27 2010  
Time: 13:50

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME- SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)



FIELD SAMPLE LOG - SEDIMENTS  
Upper Columbia River - White Sturgeon Sediment Toxicity Study  
United States Locations/Stations

*No Sample* LD-03  
June 2010

Sample No. : SD00 5 Sample Tag : T 141

LOCATION NAME	<input type="checkbox"/> Deadman's Eddy	<input type="checkbox"/> China Bend	<input type="checkbox"/> Upper Marcus Flats	<input type="checkbox"/> Lower Marcus Flats	<input checked="" type="checkbox"/> Alternate
LOCATION CODE	DME	CB	UMF	LMF	LD
STATION NO.	<input type="checkbox"/> 01	<input type="checkbox"/> 02	<input checked="" type="checkbox"/> 03	NP = Northport LD = Lower Dalles	

GRAB SAMPLE NO. (001 THROUGH 010)\* 001 SAMPLE IDENTIFIER LD-03-001  
\*Grab Sample = One Bucket LOCATION - STATION NO. - GRAB NO.

WATER DEPTH (M/FT)	UTM Northing (NAD83)	UTM Easting (NAD83)
<u>4.9</u>	<u>5414446</u>	<u>438122</u>

PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input checked="" type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) _____ YR _____ / _____		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Color (Munsell) _____ YR _____ / _____		Matrix Color / Grain Size Notes: <u>Mixed parent material</u>
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description: _____	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Description: _____	Sampler Penetration: <u>-0-</u> cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources Notes: URS Archaeologist - Mike Kelly  / Sarah McDaniel  Cultural Resources Observed: Yes  No   
(Please refer to URS archaeologist field monitoring notes) Michele Stegner

Other Notes:  
All gravels to cobble sized materials. Some boulders likely, as can be viewed thru water column. Refugel @ LD-03.  
No Sample. No sands/silts in sample. Some silts/sands stirred into river water sample 4 times - Cobble and water only

Boat: Palouse (Gravity Environmental)	Photo Directory: <u>UCR Sed 6-27-2010</u>
Sampler Type: Power Grab (Gravity Environmental)	Photo File: <u>373-382</u>

Sampler Name: Jeffery  
Sample Signature: [Signature]  
Date: 6/27 /2010  
Time: 13:00

**Sample Labeling (Refer to QAPP and Sample Key)**  
Sample No. = LMF - SD0001 through SD0003, UMF - SD0004 through SD0006, CB - SD0007 through SD0009, DME - SD0010 through SD0012 (Three sample no. per location)  
Sample Tag No. Example - T001 through T120. Sequential based on collection order and time. Assigned to specific sample number.  
Grab Sample No. Example - 001 through 010 (10 per station)

## APPENDIX E

### **Environmental Field Notebook**

Field Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010



UCR  
Sediments  
Sampling  
June 2010



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 Phone (509) 928-4413

Project UCR Seaiment Sampling  
White Sturgeon Sediment  
Toxicity Study  
June 2010

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

Specifications for this book:

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Location Kettle Falls Marina Date 6-22-10

Project / Client PERC American

Sediment Sampling

8:00

JEFF LOPPO -	URS
GARY PANTHER -	URS
MILK KELLY -	URS
JOHANNI RE	NPS
RENK MURDOX	Gravity
JEFF	Gravity
JOHN EVANS	NPS
ERIC WEINMANN	Columbia AL
JIM PETERSON	NPS
CHRIS CHRISTAL	Environment Information
MARCO RUPICH	CH <sup>2</sup> m Hill
DANNO, JEFF BRATH	URS.
JIMMOS + ORIENTATION -	
LOWE MARCUS SLAT -	Start point +
SAMPLE IDENTIFIERS -	unique #
BOAT CREWS -	Grants 9 Columbia
SAND STORAGE	4° i, Refer

Location Kettle Falls, WA Date 6/22/10

Project / Client UCR Sediment

Sampling

Orientation on SOPs, including labeling  
decon, IDW, sample processing, CoC  
health & safety, cultural resources  
observations & procedures

9:00 Finish orientation, H.S. Move to  
boats for prep & mobilization  
Check sampler. Check supplies  
& decon station setup.

10:10 All assemble @ boat dock for  
life preservers, boat H&S talk  
10:20 Eric & Pere provide boat  
safety, man-overboard, life  
actions, etc. Moving currents

Decon station setup in Palouse

Work Boat - Palouse Gravity ENV.  
Support Boat - Monarch Columbia Nav

10:30 Prep for departure

10:35 Leave dock

Location Lower Marcus Flats Date 6/22/10

Project / Client UCR Sediment Sampling 3

10:42 Palouse stops, possible mechanical issues. Coolant hose repair.

10:55 Back on course to Lower Marcus Flats Station | LMF-01

11:45 First power grab @ LMF-01  
LMF-01-001 - all black silts w/ high organic matter (likely color). 3 tries @ LMF-01

yields only river mud. Three attempts to collect competent / appropriate sand matrix. Needs review APP

12:20 Decision - move to LMF-02.

Decon power grab, lexan tray

Decon procedure → liginose wash, deionized water-distilled rinse, dilute nitric acid wash/rinse ~~100%~~ and distilled final rinse.

Note: Work w/ Jim Retzer on defining station coordinates. Will use both/all boat Lat/Long (GIS Conversion from URS) National Park Service Trimble and URS hand-held Magellan unit. Magellan + Trimble are correlated pretty well based on side by side readings

Location Lower Marcus Flats Date 6/22/10

Project / Client UCR Sediment Sampling 4

using UTM NAD83 (Zone 11). We will agree on location/position to meet cultural resource requirements. The start of LMF-01 was 9 meters south of center and 4 meters east of center → within the 20 meter diameter from pure station point.

For LMF-01, set anchor to hold vessel in location. Rene indicates boat movement in flat water w/ boat actions/sampling, currents make it difficult to remain in the 20 m diameter.

12:50 @ LMF-02. Depth to bottom is 51 meters, range from 40 to 50 meters rest in calm water. Depth 48 meters as we passed over coordinate for LMF-02. Drift around in general a neg from coordinate point, with resulting range. Gravity only has 33 meters (100ft) of airline for sampler

Location Lower Narrows Flats Date 6/22/10Project / Client UCR Sediment Sampling 7

1730 - Complete sample @ LMF-01 Head  
back to Kettle Falls Boat Launch

Notes by Jeff Leppo 1 App

Camera: Canon D-10

Location Kettle Falls, WA Date 6/23/10Project / Client Upper Columbia River  
Sediment Sampling 1

7:45 Arrive @ Kettle Falls Boat Launch  
Gravity & Columbia boats in transit  
from Columbia Navigation's dock  
Work Boat - Palouse, Gravity  
Support Boat - Morset, Columbia Nav.

Gravity has acquired additional air  
hose to reach sediments @ LMF-02  
and LMF-03

Have everyone sign in daily attendance record  
Boat setup & mobilization

8:40 Safety Mtg - emergency route  
and numbers - location in both

The Riffs HASP & URS HASP

8:50 Gravity working on new airline  
for deeper grab samples.

8:55 Head for LMF-02.

09:20 Setup over LMF-02. Establish  
control point coordinate. Use anchor  
lines fore & aft to maintain location  
40 to 50 m water depth

09:30 - work begins. Will use power grab  
to get two hexon tubs to fill  
two grab buckets. Reduce the  
power up time & increase safety

Location: Lower Narrows Flats Date 6/22/10

Project / Client: UCR Sediment Sampling 5

Review depth structure w/ Jim Retzer. His cartography map indicates LMF-02 is situated in old river channel. He indicates we should move east.

Establish location @ same UTM northing in an easterly direction

Establish new location w/ Jim @

5390157 N → 5390165 Proposed

8 meters south of Proposed north coordinate

418614 → 418470 Proposed

144 meters east of Proposed

Easting location OK w/ Jim Retzer

East bank at original channel @ 24 meters.

1400 to 1415 → <sup>Distances @ First LMF-02</sup> Sample Events 40 to 50 meters

1415 Hold up sampling at for two grabs <sup>&</sup> matrix

Mixed dark gray / black sands w/

Silts, organic matter.

1420 Speedw/ Marko - Collect all

matrix, collect sediment regardless

of sediment particle size. Need

to come back to LMF-02 w/

correct air line length.

Location: Lower Narrows Flats Date 6/22/10

Project / Client: UCR Sediment Sampling 6

1440 - Decon materials / equipment.

Return to LMF-01

1443 - Talk to David Vandy. ~~Talked~~ of

test methods? → who ever the

sediment we should continue

texture to sample until a plan is made

& let lab determine what

process & approvals to chargee

can be made, if / as necessary

w/ EPA, etc

1445 - Beck to LMF-01 Station 001

1455 Setup over LMF-01

to

1715 Sampling @ LMF-01

Collect Grabs T001 to T010

Generally - dark gray to black

silty muds w/ organic matter

decomposing

1720 Grab Samples given individual

times. Each sample SPOOL should

be same time according to

OAPP. Label each bracket

Grab w/ Sample & grab time.

Catch will have same time → 15:00 LMF-001

Location Lower Marcus Flats Date 6/23/10

Project / Client UCR Sediment Sampling 2

0945 - repairs to airline by Gravity  
Start Sampler LMF-02-001  
Toll

0950 First Grab - Time to use  
for silty LMF-02

Sticks and fibers at 2 to 15 mm dia  
in first two grabs, not competent to include  
into grab

10:50 - Discuss collection process and  
suspension of silt w/ sand matrix.

Decant out water from lexan tub  
or leave in tub and use for covering  
bucket. QAPP says decant off  
of the sampler. But can lose some  
sediments. Decide to not decant  
but hold in sampler & lexan tray  
to use as cover

11:45 Continue to collect compromised sample  
into separate tub - those where sticks  
or other obstruction prevent uniform  
collection. Obstructions continue

Location Lower Marcus Flats Date 6/23/10

Project / Client UCR Sediment Sampling 3

Note: For coordinate - continue to use  
Gravity's Garmin GPSmap 420s, VRS's  
Magellan Triton and Garmin eTrex  
to merge position. Nobeltec software

12:20 - Continue to have failure w/  
recovery due to sticks twocody  
obscure. Consult SAP4 for  
determination. May abandon after

3 attempts agreed  
to by observer <sup>lunch</sup>

12:45 Move LMF-03 > 3 failed attempts @  
LMF-03

12:55 Arrive LMF-03 setup anchors  
& coordinate point. Allow boat to stabilize

Nobeltec software w/ GPS coordinates  
14:05 Gravel & cables are prevalent

and block/hold open the sampler  
Make six attempts @ LMF-03

9 different coordinates w/in the  
20 m diameter circle, continue w/  
2 additional attempts

SD0003 T021 only sample  
9 LMF

Discuss alternative - failure to  
obtain competent sample > 3 per  
QAPP.

Location Lower Marais Flats Date 6/23/10Project / Client USC Sediment Sampling 4

1445 Decon LMF-03 eg-present on board  
w/ liguinox wash, deionized H<sub>2</sub>O wash,  
nitric acid rinse, deionized H<sub>2</sub>O wash/rinse

Notes on LMF-02 and LMF-03 - wood  
debris (LMF-02) and gravels/cobbles (LMF-03)  
Required rejection of the grabs.  
Sediment surface was disturbed &  
winnowing & leaching were present  
in both substrates

LMF-02 Predominately grayish to  
yellowish brown silts (approx 5 cm)  
over black sands. Significant woody  
debris in silt & surface of bottom

LMF03 - yellowish brown silts  
(approx 5 cm) over mixed parent  
material matrix of sands (well graded)  
gravels and cobbles.

Location Upper Marais Flats Date 6/23/10Project / Client USC Sediment Sampling 5

1505 - Arrive @ UMF-02. Setup  
w/ anchors to hold position near  
coordinate & within 20m diameter

1605 Start Sample @ UMF-02-001  
Good recovery. Silt & sand  
Very fine sands, ML.  
Uniform color & matrix.

Few grasses/vegetation observed  
approx 7 to 10cm lengths. Also  
red leeches.

16:25 Finish @ UMF-02 for today  
& head for boat launch

17:15 Meet w/ Univ. of Sask. crew  
to hand off samples & sign  
CoF.C. See photos for view  
of CoF.Cs. Univ. will pay  
& send copies upon receipt  
@ laboratory

17:30 Head for mobil / demobilization

Notes by Jeff Lepp 4/23/10

Location Kettle Falls Boat Launch Date 6/24/10Project / Client VCR Sediment Sampling 1

0740 Arrive @ boat launch, prep for upper Maravus Flats (UMF). New URS archaeologist today - Sarah McDaniel. New NPS archaeologist observers today.

0810 Orientation mtg w/ Nicole Badon and Sarah McDaniel. Nicole needs to review and sign HASP

Note: Craig Christian - observer for both CCT and Ecology

0830 Health & Safety Meeting - new personnel, detailed ATIS review of individual boat layout and work zones responsibilities. Trip stops, falls pinch points. Fire extinguishers, emergency reactions

0840 leave dock for UMF02

0855 Arrive @ UMF02  
Setup over coordinate. Note: Close to cultural resources Old Maravus → Need to take

Location Lower to Upper Maravus Date 6/24/10Project / Client VCR Sediment Sampling 2

care in working this area. Stop south of onpoint. Discuss w/ Sarah & Jonathan (NPS) archaeologists

0915 - Work on coordinates moving to position. Some difficulty w/ satellite reception on all GPS, plus NPS Trimble units to stabilize. Work anchors sets

10:00 Sampling @ UMF-02 Begins

↓

11:20 Goodwell sample @ UMF02  
Move to UMF-02

11:45 Arrive @ UMF-01

Setup anchors to control over coordinate.

12:10 Start @ UMF-01

↓

14:30 Finish @ UMF-01

Predominate dark greyish brown well graded sand matrix, salt pepper of black fine sands w/ brownish yellow / yellowish brown med & coarse sands. Some variable silt content, layers / strata mixed into sands, distinct.



Location Upper Merous Flats Date 6/24/10

Project / Client USR Sediment Sampling

3

15:10 Arrive @ UMF-03. Establish coordinate fix and set anchors to hold on station.  
Decon completed by Gary P. - 1 gunnax wash, deionized H<sub>2</sub>O wash, nitric acid rinse, " " rinse for buckets, lexan tray & scoop.

17:00 Finish @ UMF-03. River mud/silts Cleanup deck, move/demob

17:50 Bucket Deck, Meet w/ Univ S&K Transfer 28 buckets to refrigerator truck, complete CoC transfer (17:55)

Notes by Jeff Leppo  
JLL

Location \_\_\_\_\_ Date \_\_\_\_\_

Project / Client \_\_\_\_\_

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6/27/10  
J Leppo

China Bend

Location

Date 6/25/10

Date

Project / Client UCR Sediment

Sampling Program

(1)

0800 Arrive @ China Bend, mobilization load boats.

0840 Daily safety meeting and check-in  
Switch water rescue, first aid kits  
1 fire extinguishers

0850 Leave dock for CB-02 station  
sequence CB-02 → CB-01 → CB-03

0910 Arrive @ CB-02, setup anchors for maintaining control w/in coordinate range.

\* Gary has completed bucket-decon @ dock. Collect IDW in sealed 5 gal bucket.

0950 Boat positioned. Sampler decontaminated w/ Lignox wash, DI water rinse, nitric acid wash, DI water rinse

1010 Relatively slow to moderate current. Srel depth to bottom (17m) cause line w/ pneumatic hose to bow & drag back sampler. This does not allow sample to set flat on bottom

Eric Weatherman reports 196K cfs currently flowing. Little to no recovery. 2 Fries, no results

China Bend

Location

Date 6/25/10

Date

Project / Client UCR Sediment

Sampling Program

(2)


10:30 Gravity crew decides to hookup Van Veen Sampler. Prep w/ extra weight from lead balls.

\* Resistive sample in first several attempts w/ Power Grab indicate possible well

graded sands, mixed parent material & silt

10:50 Van Veen Sampler attempted - river current 1 anchor set does not permit sampling.

Sampler tips on side @ river bottom

Current →  Sampler River Surface Bottom 2 tries

11:00 Discuss options - get anchor to establish coordinate center then attach buoy - anchor w/ buoy using length of anchor rope/chain.

11:15 Lay out chain & rope to attach to anchor/buoy  $16.4 \text{ meters } 53 \text{ feet}$  Water Depth  
7 feet at anchor Scope \ angle = 60 ft (53 ft)

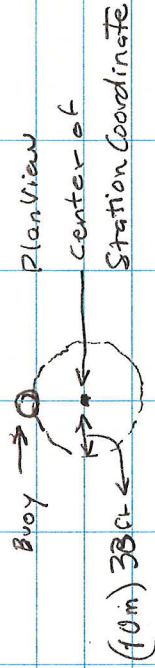
Chain 12' + Rope 48' = 60 ft. - crew decides to add additional scope →

Keep buoys as close to vertical as possible = 60 + addal 6ft = 66ft. (20m)

Location China Bend Date 6/25/10Project / Client UCR Sediment Sampling ③

Boat

11:30 Crew works on anchor / buoy line.  
Rene works + setup buoy on coordinate  
meet w/ Rene + Eric to review sample  
program. Use Polarise to set buoy @  
northern limit of coordinate circle.



Discuss w/ technical observers Craig  
Christian and Nicole Bedon  
- are OK w/ method, need to review  
QAPP details.

QAPP SOP-1 Positioning

- buoy line @ approx 1.1 to 1 slope
- vessel maneuvered so that buoy is  
no more than 10m from vessel

at the time the sampler contacts  
the bottom. Begin drop @ north tangent

Based on discussions w/ Rene and Eric

This approach meets these requirements

Allows for current, 1 ft / sec sampler.

drop, + positioning

12:10 Drop buoy several times to get  
correct buoy set

Location China Bend Date 6/25/10Project / Client UCR Sediment Sampling ④

12:13 Rene confirms that buoy location is 30 ft N  
from coordinate center based on CB-02  
coordinate entry 432120, 5408773

12:20 Review procedure w/ crew + technical  
observers. Work to setup the drop point

1st Try - water only

Rene marks sampler contact point

w/ Nobeltec

2nd Try - water only

12:45 Exhaust options - no reasonable method  
can be determined @ this time to get  
sample using available equipment per  
QAPP guidelines. Decide to consider

this to fulfill the 3 attempt - evidence  
and move to CB-01

Pull buoy

1305 Pull up on CB-01 to set buoy ⑤

north tangent, 10 meters (33 ft)  
from center coordinate.

1315 Buoy set and marked on Nobeltec

Gay decon's sampler

13:30 1st Sample - not competent sample

Approx 3 to 6 cm of mixed parent

referred yellowish brown + black sands (SM)

Location China BendDate 6/25/10Project / Client UCR Sediment Sampling

(5)

Grab Sampler did not appear to level  
off and settle under an undisturbed  
scenario. Water depth 17.2 m

2nd Attempt - pull up single  
cobble / rounded convex discus  
1335 shape. Return to river bottom  
8 to 10 inch diameter

1340 3rd Attempt - mixed percent method  
5W sands, 5 to 10 cm, disturbed  
& centered in sampler

Some silts present. Sample  
appears washed, angled in sampler  
Decide to move to CB-03

1355 - Move to CB-03. Set up buoy  
w/ anchor at north tangent to  
center coordinate. 13.1 Meters <sup>River</sup> depth

Re-position buoy to meet 10 m radius  
1405 Gary decans before CB-03

1410 Start CB-03 T081

1417 First attempt, tree limb, stems  
and organic matter, no sediment.  
Milfoil?? Vegetation on limb.

Location China BendDate 6/25/10Project / Client UCR Sediment Sampling

(6)

1425 2nd attempt. Mixed sands  
well graded, gravels & cobbles (GW)  
QAPP defines cobbles as unsuitable  
material. Not confident that sample lenses  
undisturbed.

Discuss sample w/ technical observers,  
review QAPP for guidelines. Reject  
sample. 50/50 estimate gravel/sands

1430 Third attempt, some gravel  
gravel prevents closing clam-shell  
Third attempt - no sample

1445 Close out CB-03

15:00 Back to China Bend

Boat Launch.

15:20 Return to Colville

Location Deadman's Eddy Date 6/26/10Project / Client UCL Sediment Sampling  
(Start Northport Boat Lagoon) (1)

0755 - Arrive @ DME, Gravity Env. + Columbia Bay boats in water. Crews setting up boats for day's sampling. Water level is up to near-top of dock and ramp. Discuss today's water conditions w/ Renato and Eric W.

0830 - Leave for DME. Completed health & safety meeting - positions in muddy water, awareness, buddy checks.

0850 - Setup above DME-02. Located in eddy on south river bank. Good current flow upstream. GPS shows 1/2 mph. Approx 10m depth working on setting up over station coordinate to set anchor.

0914 - GPS setup. Reverse Nobeltec to position. Continue to try & set creosoles. Satellite acquisition is spotty - lose 1 to 2 sets. Then position. Reverse + move to DME-01

1020 Lose satellite reception, as will DME-02. Nobeltec / antenna are not able to pick up satellite

Location Deadman's Eddy Date 6/26/10Project / Client UCL Sediment Sampling

(2)

10:30 No satellite reception w/ Boat GPS. Rene needs Nobeltec system to position boat to coordinate reference + hold / set anchor. Hand held units (Magellan Triton / Garmin Map 720s)

10:35 - Try boat move to DME-03. Then back to DME-02. Reception poor to navigate with or get lighter drop out.

10:45 Satellite back. Rene maneuver over DME-02. Start grab Sampler. See Field log for DME-02 - 001

11:10 finished at DME-02. No suitable recovery due to cobbles. Three attempts.

11:12 Move to DME-01 adjacent to gravel bar.

11:45 DME-01 - no suitable recovery due to cobbles.

first attempt ~~with~~ minimal recovery, well-graded mixed sand  
second attempt - 1 cobble recovered

Location Deadman's Eddy Date 6/26/10Project / Client UCR Sediment Sampling (3)

11:50 DME-01 Station has swift current w/ difficulty in setting power grab. River depth approx 3 to 4 m. Appears to be cobble sized material w/ sand interspersed, but unable to determine the <sup>fine</sup> particle size. Water depth coordinate to deep sea bottom.

11:55 Move up for third attempt. Few cobbles. No success on DME-01

12:15 Break for lunch

13:05 Head to DME-03

13:25 Attempts to recover samples from DME-03 failed. Grabs only brought up water - could be due to presence of lg. rocks. Three attempts. River depth 5.5-6 m, strong current, w/in eddy.

13:30 Complete decontamination of equipment. Sampler, etc. after DME-03. No recoveries on DME-03.

13:40 Review CDT + NPS permits w/ technical observers, per their question to ascertain appropriate QAPP is the disc. of record for this project, per ORS's scope + SOPs w/ OAPP

Location Deadman's Eddy Date 6/26/10Project / Client UCR Sediment Sampling (4)

To determine the station locations used were approved by EPA, tribes, etc. Tell them we must stay within these limits.

13:50 Return to Northport Boat Launch.

Today's Record /

Notes By:

Jeff Lepp, LG  
Sarah McDaniel, EPA

Location Northport Date 6/27/10Project / Client UCR Sediment Sampling  
(Start Northport Boat Launch) ①

0800 Crew, tech. observers and URS meet @ boat launch. Orientation + health & safety meeting. P. issues today's program. Sequence NP-02 → NP-03 → NP-01

08:30 Head up for NP-02 north of boat launch.

0910 - Finish @ NP-02 - no recovery, large boulders and headrock visible on shore. Frigates bottom depths, average approx 5 meters but dependent on position. Trace sands only. Move to NP-03 after 3 attempts. Conditions indicate other attempts would not be effective.

0915 Decon sample equipment.

Prep for NP-03

0920 Start sample @ NP-03

Variable recovery. Uniform poorly graded dark brown sands. Gravel to cobble sized materials limit.

10:30 recovery - unable to close Power Grab

Location Northport Date 6/27/10Project / Client UCR Sediments Sample ②

Chamshell. Collect T171-T173

T174 - continue w/ 5 refusals. Pericle to close NP-03.

10:55 - decon sample equipment and Power Grab.

11:10 Complete decon. leave duck to maneuver over NP-01

11:15 Start NP-01. First grab

is well graded black sand w/ yellowish brown (10xR z1 and 10xR S16)

Predominate color is black sand.

Subsequent 5 attempts do not

yield competent sample. Cobble

to boulder sized rock in remaining

attempts. No sample / refusal

11:40 End NP-01. Decon @

Northport Dock. Collect IPAW

in tub then transfer to 5 gal bucket

Wait for Jonathan Rein <sup>(P)</sup> & Michele

Stegner (URS), archaeologists for

Little Dalke.

Lunch

Location Little Dalles Date 6/27/10Project / Client UCR Sediment Sample (3)

12:30 Jonathan & NPS) and Michele (URS) arrive. Sarah provides archeological field observation & log requirements.

12:45 → 13:00 Travel to LD-03  
Setup over station coordinate

13:00 LD-03, T141. All

cobbles/boulders, few suspended  
silt/sands in sampler 4 efforts  
for retrieval - refusal

13:15 Dean equipment / sampler

13:20 Move to LD-02

13:35 Arrive @ LD-02. Set

up for sampling. Coordinate in

moderately swift current w/ 20 to

23 meters of river depth ~~up river~~ <sup>marker</sup>

Floot up to ~~up river~~ up river

tangent position 10 meters up gradient

Then drop sampler to float back

w/ current to sample bottom

Revised w/ ground to cube sized

material w/ some sands.

\* 4 to 6 ft white sturgeon surface and rolls  
in current w/in 50 meters of boat

Location Little Dalles Date 6/27/10Project / Client UCR Sediment Sample (4)

14:15 Finish @ LD-02. Dean.  
↳ Leave for LD-01

14:30 LD-01 Arrive.  
Setup w/ coordinate station  
Prep for sample

↳ Work on LD-01, relatively  
15:30 good recovery, few refusals  
or rejects due to sticks,  
sloughing, winnowing.

Collect 40 grab samples

LD-01-001 to LD-01-010

Black fine sands predominate

16:50 Complete work @ LD-01

Head back to Northport Boat

Launch @ 1700

Return to Northport, unload equipment  
and samples

18:10 - Meet w/ Univ. of Saskatchewan

Jeff Thomson & Brett Terrell. Transfer

Sample Order Co/C Protocol @

18:25 NP and 18:30 LD into refrigerated

truck.



Location Northport Boat Launch Date 6/27/10

Project / Client UCR Sediment Sampling

(5)

18:55 - Finish work & leave

Northport

Notes by Jeff Jago

\* Michele Stegner assisted w/ UTM coordinate acquisition for grab samples

Location \_\_\_\_\_ Date \_\_\_\_\_

Project / Client \_\_\_\_\_

Empty grid area for notes on page 35.

## APPENDIX F

### **Chain of Custody Forms**

Field Report  
Sediment Sampling Program  
Assessment of Sediment Toxicity to White Sturgeon  
June 22 through 27, 2010





<b>CHAIN of CUSTODY</b> Project: _____ Lab Turn-around Time: _____ Please refer to project QAPP (May 2010)		Page <u>1</u> of <u>1</u>					
Client: Teck American Incorporated 501 North Riverpoint Blvd, Ste 300 Spokane, WA 99202 Project Manager: Kris McCallg, kris.mccalg@teck.com		Telephone No. 509-459-4451 Fax No. 509-459-4400 P.O. # _____					
Sample Tag No.	Matrix	Sampling Date	Sampling Time	Analytical / Physical Parameters Upper Columbia River RI/FS - Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon (May 2010)	No. of Containers	Sample Notes and Comments	Lab ID No.
✓ SD00013 ✓ SD00013 ✓ SD00013 ✓ SD00013 ✓ SD00013 ✓ SD00013 ✓ SD00013 ✓ SD00013 ✓ SD00013 ✓ SD00013 ✓ SD00013	Sed Sed Sed Sed Sed Sed Sed Sed Sed Sed	6/27/2010 6/27/2010 6/27/2010 6/27/2010 6/27/2010 6/27/2010 6/27/2010 6/27/2010 6/27/2010 6/27/2010	14:35 14:35 14:35 14:35 14:35 14:35 14:35 14:35 14:35 14:35	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	1 1 1 1 1 1 1 1 1 1	          	          
<b>Custodial Record</b> Relinquished by: <i>Jeff Thomson</i> (Sign & Print Name) Received by: <i>Jeff Thomson</i> Relinquished by: <i>Jeff Thomson</i> Received by: <i>Ryan Dove</i> Relinquished by: <i>Ryan Dove</i> Received by: <i>David Vandy</i>				Date 6/27/10 6/27/10 7/01/10 7/01/10 7/12/10 7/12/10	Time 18:30 18:30 0900 0900 1500 1500	Unique Chain of Custody No. UCRSED0013 Laboratory Work Order No.	



**CHAIN of CUSTODY**

Client: Teck American Incorporated 501 North Riverpoint Blvd, Ste 300 Spokane, WA 99202 Project Manager: Kris McCallig, kris.mccallig@teck.com		Project: UCR - Assessment of Sediment Toxicity (U.S.) Telephone No. 509-459-4451 Fax No. 509-459-4400 P.O. #		Lab Turn-around Time: Please refer to project OAPP (May 2010) Location: Lower Marcus Flats Station No. 1 <b>LMF-01</b>				
Sample No.	Sample Tag No.	Matrix	Sampling Date	Sampling Time	Analytical / Physical Parameters	No. of Containers	Sample Notes and Comments	Lab ID No.
SD0001	T001	Sed	6/22/2010	15:00	Upper Columbia River R/IFS - Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon (May 2010)	1		
SD0001	T002	Sed	6/22/2010	15:00		1		
SD0001	T003	Sed	6/22/2010	15:00		1		
SD0001	T004	Sed	6/22/2010	15:00		1		
SD0001	T005	Sed	6/22/2010	15:00		1		
SD0001	T006	Sed	6/22/2010	15:00		1		
SD0001	T007	Sed	6/22/2010	15:00		1		
SD0001	T008	Sed	6/22/2010	15:00		1		
SD0001	T009	Sed	6/22/2010	15:00		1		
SD0001	T010	Sed	6/22/2010	15:00		1		
Custodial Record						Sample Receiving Notes		
Relinquished by: <i>Jeffery E. Leppo</i>		Date	6/22/2010	Time	17:55			
Received by: <i>Jeff D. Thomson</i>		Date	6/22/2010	Time	17:55			
Relinquished by: <i>Jeff D. Thomson</i>		Date	7/01/2010	Time	09:00			
Received by: <i>Ryan Dove</i>		Date	7/01/2010	Time	09:00			
Relinquished by:		Date		Time				
Received by Laboratory:		Date		Time				
Unique Chain of Custody No. UCRSED001						Laboratory Work Order No.		



Client: Teck American Incorporated 501 North Riverpoint Blvd, Ste 300 Spokane, WA 99202 Project Manager: Kris McCalig, kris.mccalig@teck.com			Project: UCR - Assessment of Sediment Toxicity (U.S.) Telephone No. 509-459-4451 Fax No. 509-459-4400 P.O. #			Page 1 of 1 Lab Turn-around Time: Please refer to project QAPP (May 2010) Location: UMF-01																				
Sample Tag No.			Matrix			Sampling Date			Sampling Time			Analytical / Physical Parameters			No. of Containers			Sample Notes and Comments			Lab ID No.					
July 12/10 264 Sample No.	✓	SD0004	T031	Sed	6/24/2010	12:10	✓	Upper Columbia River RI/FS - Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon (May 2010)	1																	
	✓	SD0004	T032	Sed	6/24/2010	12:10	✓		1																	
	✓	SD0004	T033	Sed	6/24/2010	12:10	✓		1																	
	✓	SD0004	T034	Sed	6/24/2010	12:10	✓		1																	
	✓	SD0004	T035	Sed	6/24/2010	12:10	✓		1																	
	✓	SD0004	T036	Sed	6/24/2010	12:10	✓		1																	
	✓	SD0004	T037	Sed	6/24/2010	12:10	✓		1																	
	✓	SD0004	T038	Sed	6/24/2010	12:10	✓		1																	
	✓	SD0004	T039	Sed	6/24/2010	12:10	✓		1																	
	✓	SD0004	T040	Sed	6/24/2010	12:10	✓		1																	
Custodial Record																		Unique Chain of Custody No.								
Relinquished by: Jeffrey E. Gopp																		Date			Time			Sample Receiving Notes		
Received by: Jeff Thomson																		Date			Time			Laboratory Work Order No.		
Relinquished by: Jeff Thomson																		Date			Time					
Received by: Ryan Dove																		Date			Time					
Relinquished by: Ryan Dove																		Date			Time					
Received by: David Voss																		Date			Time					



<b>CHAIN of CUSTODY</b> Project: _____ Lab Turn-around Time: _____ Please refer to project QAPP (May 2010)		Page <u>1</u> of <u>1</u>					
Client: Teck American Incorporated 501 North Riverpoint Blvd, Ste 300 Spokane, WA 99202 Project Manager: Kris McCallig, kris.mccallig@teck.com		Telephone No. 509-459-4451 Fax No. 509-459-4400 P.O. # _____					
Sample Tag No.	Matrix	Sampling Date	Sampling Time	Analytical / Physical Parameters Upper Columbia River RI/FIS - Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon (May 2010)	No. of Containers	Sample Notes and Comments	Lab ID No.
SD0018	Sed	6/27/2010	09:20	✓	1		
SD0018	Sed	6/27/2010	09:20	✓	1		
SD0018	Sed	6/27/2010	09:20	✓	1		
<del>SD0018</del>	<del>Sed</del>	<del>/ / /2010</del>	<del>:</del>				
<del>SB0018</del>	<del>Sed</del>	<del>/ / /2010</del>	<del>:</del>				
<del>SD0018</del>	<del>Sed</del>	<del>/ / /2010</del>	<del>:</del>				
<del>SD0018</del>	<del>Sed</del>	<del>/ / /2010</del>	<del>:</del>				
<del>SB0018</del>	<del>Sed</del>	<del>/ / /2010</del>	<del>:</del>				
<del>SD0018</del>	<del>Sed</del>	<del>/ / /2010</del>	<del>:</del>				
<del>SD0018</del>	<del>Sed</del>	<del>/ / /2010</del>	<del>:</del>				
<b>Custodial Record</b>							
Relinquished by: <i>Jeff E. Leggo</i>		Date	6/27/10	Time	18:25	Unique Chain of Custody No. UCRSED0018	
Relinquished by: <i>Self Thomsen</i>		Date	6/27/10	Time	18:25	Laboratory Work Order No.	
Relinquished by: <i>Jeff Thomsen</i>		Date	7/01/10	Time	0900		
Relinquished by: <i>Ryan Dove</i>		Date	7/01/10	Time	0900		
Relinquished by: <i>Ryan Dove</i>		Date	7/12/10	Time	1500		
Relinquished by: <i>David Ward</i>		Date	7/12/10	Time	1500		



Client: Teck American Incorporated  
 501 North Riverpoint Blvd, Ste 300  
 Spokane, WA 99202  
 Project Manager: Kris McCallg, kris.mccalg@teck.com

Project: UCR - Assessment of Sediment Toxicity (U.S.)  
 Telephone No. 509-459-4451  
 Fax No. 509-459-4400  
 P.O. #

Lab Turn-around Time: Please refer to project QAPP (May 2010)  
 Location: Lower Marcus Flats  
 Station No. 2 LMF-02

Page 1 of 1

Sample No.	Matrix	Sampling Date	Sampling Time	Analytical / Physical Parameters		No. of Containers	Sample Notes and Comments	Lab ID No.
				Upper Columbia River RIFS - Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon (May 2010)				
T011	Sed	6/23/2010	09:50	✓		1		
T012	Sed	6/23/2010	09:50	✓		1		
T013	Sed	6/23/2010	09:50	✓		1		
T014	Sed	6/23/2010	09:50	✓		1		
T015	Sed	6/23/2010	09:50	✓		1		
<del>T016</del>	<del>Sed</del>	<del>/ / 2010</del>	<del>:</del>					
<del>T017</del>	<del>Sed</del>	<del>/ / 2010</del>	<del>:</del>					
<del>T018</del>	<del>Sed</del>	<del>/ / 2010</del>	<del>:</del>					
<del>T019</del>	<del>Sed</del>	<del>/ / 2010</del>	<del>:</del>					
<del>T020</del>	<del>Sed</del>	<del>/ / 2010</del>	<del>:</del>					

Custodial Record		Sample Receiving Notes	
Relinquished by:	Date	Time	Unique Chain of Custody No.
Jeffrey E. Leppo	6/23/2010	17:15	UCRSED002
Jeff Thomson	6/23/2010	17:15	Laboratory Work Order No.
Jeff Thomson	7/01/2010	09:00	
Ryan Dove	7/01/2010	09:00	
Ryan Dove	7/12/2010	1500	
Quel Vandy	7/12/2010	1500	



**Client:** Teck American Incorporated  
 501 North Riverpoint Blvd, Ste 300  
 Spokane, WA 99202  
**Project Manager:** Kris McCallig, kris.mccallig@teck.com

**Project:** UCR - Assessment of Sediment Toxicity (U.S.)  
 Telephone No. 509-459-4451  
 Fax No. 509-459-4400  
 Station No. 3 **LMF-03**

Page 1 of 1  
 Lab Turn-around Time:

Please refer to project QAPP (May 2010)  
 Location: Lower Marcus Flats

Sample Tag No.	Matrix	Sampling Date	Sampling Time	Analytical / Physical Parameters		No. of Containers	Sample Notes and Comments	Lab ID No.
				Upper Columbia River RIFS - Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon (May 2010)	Sturgeon			
T021	Sed	6/23/2010	13:25	✓		1		
<del>T022</del>	Sed	/ / 2010	:					
<del>T023</del>	Sed	/ / 2010	:					
<del>T024</del>	Sed	/ / 2010	:					
<del>T025</del>	Sed	/ / 2010	:					
<del>T026</del>	Sed	/ / 2010	:					
<del>T027</del>	Sed	/ / 2010	:					
<del>T028</del>	Sed	/ / 2010	:					
<del>T029</del>	Sed	/ / 2010	:					
<del>T030</del>	Sed	/ / 2010	:					

Sample No.	Sampler (Sign & Print Name)	Date	Time
T021	Jeffrey E. Leppo	6/23/10	1715
T021	Jeff Thomsen	6/23/10	1715
T021	Jeff Thomsen	7/01/10	0900
T021	Ryan Dove	7/01/10	0900
T021	Ryan Dove	7/12/10	1500
T021	Paul Keady	7/12/10	1500

**Custodial Record**  
 Relinquished by: [Signature]  
 Relinquished by: [Signature]  
 Relinquished by: [Signature]  
 Relinquished by: [Signature]

Unique Chain of Custody No. UCRSED003  
 Laboratory Work Order No.





<b>CHAIN of CUSTODY</b> Project: _____ Lab Turn-around Time: _____ Please refer to project QAPP (May 2010) Location: <b>UMF-02</b>		Page <u>1</u> of <u>1</u>						
Client: <b>Teck American Incorporated</b> 501 North Riverpoint Blvd, Ste 300 Spokane, WA 99202 Project Manager: <b>Kris McCallg, kris.mccalg@teck.com</b>		Telephone No. <b>509-459-4451</b> Fax No. <b>509-459-4400</b> P.O. # _____						
Sample No.	Sample Tag No.	Matrix	Sampling Date	Sampling Time	Analytical / Physical Parameters	No. of Containers	Sample Notes and Comments	Lab ID No.
<del>SD0005</del>	<del>T041</del>	<del>Sed</del>	<del>6/24/2010</del>	<del>10:00</del>	<del>Upper Columbia River RIFS - Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon (May 2010)</del>	<del>0</del>		
<del>SD0005</del>	<del>T042</del>	<del>Sed</del>	<del>6/24/2010</del>	<del>10:00</del>		<del>0</del>		
SD0005	T043	Sed	6/24/2010	10:00	✓	1		
SD0005	T044	Sed	6/24/2010	10:00	✓	1		
SD0005	T045	Sed	6/24/2010	10:00	✓	1		
SD0005	T046	Sed	6/24/2010	10:00	✓	1		
SD0005	T047	Sed	6/24/2010	10:00	✓	1		
SD0005	T048	Sed	6/24/2010	10:00	✓	1		
SD0005	T049	Sed	6/24/2010	10:00	✓	1		
SD0005	T050	Sed	6/24/2010	10:00	✓	1		
<b>Custodial Record</b> Relinquished by: <i>Jeff Thompson</i> Received by: <i>Jeff Thompson</i> Relinquished by: <i>Jeff Thompson</i> Received by: <i>Ryan Dove</i> Relinquished by: _____ Received by Laboratory: _____					Sample Receiving Notes Date <b>6/24/10</b> Time <b>17:55</b> Date <b>6/24/10</b> Time <b>17:55</b> Date <b>7/01/10</b> Time <b>0900</b> Date <b>7/01/10</b> Time <b>0900</b> Date _____ Time _____			
Unique Chain of Custody No. <b>UCRSED005A</b> Laboratory Work Order No. _____								



<b>CHAIN of CUSTODY</b> Project:		Page <u>1</u> of <u>1</u>							
Client: <b>Teck American Incorporated</b> 501 North Riverpoint Blvd, Ste 300 Spokane, WA 99202 Project Manager: <b>Kris McCaig, kris.mccaig@teck.com</b>		Lab Turn-around Time: Please refer to project QAPP (May 2010) Location: <b>UMF-03</b>							
Telephone No. 509-459-4451 Fax No. 509-459-4400 P.O. #		Project: <b>UCR - Assessment of Sediment Toxicity (U.S.)</b>							
Sample No.	Sample Tag No.	Matrix	Sampling Date	Sampling Time	Analytical / Physical Parameters	No. of Containers	Sample Notes and Comments	Lab ID No.	
SD0006	T051	Sed	6/24/2010	15:45	Upper Columbia River R/FS - Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon (May 2010)	1			
SD0006	T052	Sed	6/24/2010	15:45		1			
SD0006	T053	Sed	6/24/2010	15:45		1			
SD0006	T054	Sed	6/24/2010	15:45		1			
SD0006	T055	Sed	6/24/2010	15:45		1			
SD0006	T056	Sed	6/24/2010	15:45		1			
SD0006	T057	Sed	6/24/2010	15:45		1			
SD0006	T058	Sed	6/24/2010	15:45		1			
SD0006	T059	Sed	6/24/2010	15:45		1			
SD0006	T060	Sed	6/24/2010	15:45		1			
<b>Custodial Record</b> Relinquished by: <i>[Signature]</i>		Date: 6/24/10 Time: 17:55		Sample Receiving Notes		Unique Chain of Custody No. UCRSE0006		Laboratory Work Order No.	
Received by: <i>[Signature]</i>		Date: 6/24/10 Time: 17:55		Relinquished by: <i>[Signature]</i>		Date: 7/01/10 Time: 0900		Relinquished by: <i>[Signature]</i>	
Received by: <i>[Signature]</i>		Date: 7/01/10 Time: 0900		Relinquished by: <i>[Signature]</i>		Date: 7/01/10 Time: 0900		Relinquished by: <i>[Signature]</i>	
Relinquished by: <i>[Signature]</i>		Date: 7/01/10 Time: 0900		Relinquished by: <i>[Signature]</i>		Date: 7/01/10 Time: 0900		Relinquished by: <i>[Signature]</i>	
Received by Laboratory:		Date:		Time:		Date:		Time:	



Client: <b>Teck American Incorporated</b> 501 North Riverpoint Blvd, Ste 300 Spokane, WA 99202 Project Manager: <b>Kris McCallg, kris.mccalg@teck.com</b>	Project: <b>UCR - Assessment of Sediment Toxicity (U.S.)</b> Telephone No. 509-459-4451 Fax No. 509-459-4400 P.O. #	Page <u>1</u> of <u>1</u> Lab Turn-around Time: Please refer to project QAPP (May 2010) Location: <b>UMF-02</b>
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Sample No.	Sample Tag No.	Matrix	Sampling Date	Sampling Time	Analytical / Physical Parameters		No. of Containers	Sample Notes and Comments	Lab ID No.
					Upper Columbia River R/FS - Quality Assurance Project Plan for the Assessment of Sediment Toxicity to White Sturgeon (May 2010)	✓			
SD0005	T041	Sed	6/23/2010	16:05	✓		1		
SD0005	T042	Sed	6/23/2010	16:05	✓		1		
<del>SD0005</del>	<del>T043</del>	<del>Sed</del>	<del>1/2010</del>	<del>:</del>					
<del>SD0005</del>	<del>T044</del>	<del>Sed</del>	<del>1/2010</del>	<del>:</del>					
<del>SD0005</del>	<del>T045</del>	<del>Sed</del>	<del>1/2010</del>	<del>:</del>					
<del>SD0005</del>	<del>T046</del>	<del>Sed</del>	<del>1/2010</del>	<del>:</del>					
<del>SD0005</del>	<del>T047</del>	<del>Sed</del>	<del>1/2010</del>	<del>:</del>					
<del>SB0005</del>	<del>T048</del>	<del>Sed</del>	<del>1/2010</del>	<del>:</del>					
<del>SB0005</del>	<del>T049</del>	<del>Sed</del>	<del>1/2010</del>	<del>:</del>					
<del>SD0005</del>	<del>T050</del>	<del>Sed</del>	<del>1/2010</del>	<del>:</del>					

Custodial Record		Sample Receiving Notes	
Relinquished by:	Date	Time	Unique Chain of Custody No.
<i>Jeffrey E. Leppo</i>	6/23/2010	1715	UCRSED005
<i>Jeff Thomsen</i>	6/23/2010	1715	Laboratory Work Order No.
<i>Jeff Thomsen</i>	7/01/10	0900	
<i>Ryan Dove</i>	7/01/10	0900	
Relinquished by:	Date	Time	
Received by:	Date	Time	
Relinquished by:	Date	Time	
Received by Laboratory:	Date	Time	

## **APPENDIX C-2**

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FIELD REPORT AND RECORDS

METHODS DEVELOPMENT FOR THE

WHITE STURGEON SEDIMENT TOXICITY STUDY

SEDIMENT SAMPLING

JUNE 30, 2010 MEMORANDUM



## MEMORANDUM

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**TO:** Marko Adzic, Teck American Incorporated  
**FROM:** Jeffrey E. Leppo, LG  
**DATE:** June 30, 2010  
**FILE:** 36310054.00001  
**SUBJECT:** Field Report and Records – Methods Development for the White Sturgeon Sediment Toxicity Study Sediment Sampling, British Columbia, Canada

---

### Introduction

URS Incorporated (URS) conducted field services for Teck American Incorporated (Teck) on the Columbia River (CR) at Birchbank Eddy (BBE), Genelle (GE), and Lower Arrow Lake (LALL) sediment sampling locations in British Columbia, Canada on May 12 and 13, 2010. The field services scope of work was based on the requirements and standard operating procedures (SOP) outlined within the *Quality Assurance Project Plan – Methods Development for the White Sturgeon Sediment Toxicity Study* (QAPP) prepared for Teck in April 2010.

Field records attached to this memorandum include:

- Photographs of the locations, general sampling procedures, and grab samples
- Field Data/Sampling Diary sheets for each sample location and station
- Photocopy of the hard-bound Environmental Field Book daily record
- Chain-of-custody for May 12 and 13, 2010 grab samples

### Scope of Work

Three below-water sediment sampling locations and coordinates are identified in the QAPP, including BBE, GE, and LALL located above Trail, British Columbia. Each of the three general sample locations was accessed by boat and positioned for sediment grab sampling by Gravity Environmental, Inc. (Gravity) based on the QAPP coordinates. The longitude and latitude coordinates for each grab sample station were marked using the sample boat's global positioning system (GPS) and recorded on the individual field data/sampling diaries. Table 1 presents coordinates of each grab sample location. Sediment sample locations are shown in Map 1.

All sediment samples were collected using a decontaminated compressed air operated Power Grab sampler. Sediment was collected as ten grab samples at each general location and transferred to five-gallon decontaminated polyethylene buckets; dependent on the river bottom composition and sample recovery. Unique sample numbers and tags were assigned based on QAPP SOP-4 instructions.

Photographs of each location, sample procedures, and grab samples were taken and are sequentially identified using a white board to record pertinent information (e.g., time, date, and location) within Attachment A. Typical sampling activities and sediments collected during this event are presented in Figures 1 through 15.



# MEMORANDUM

Marko Adzic, Teck American Incorporated

June 30, 2010

Page 2 of 2

Individual photo files are labeled with the name of the station and a sequential number within the photographic directory for each of the three locations, as follows:

Birchbank Eddy – BBE\_001 to BBE\_021

Genelle – GE\_001 to GE\_045

Lower Arrow Lake – LALL\_001 to LALL\_035

Field data and sampling diary sheets were prepared for each grab sample (Attachment B). Field sampling diaries include observations on the weather, time, latitude and longitude, water depth, sediment texture and characteristics, photograph record, abnormalities, and other relevant notes. A bound environmental field book (Attachment C) was used to record general information regarding project personnel, activities, and operations.

## Field Observations

Ten competent grab samples (five gallons each) were obtained from both the Genelle and Lower Arrow Lake locations; for a total of 20 grab samples. The river bottom composition of the Birchbank Eddy was primarily composed of cobble and boulder-sized material. Three attempts were made to collect sediments at this location; unfortunately, the presence of a coarse substrate precluded the recovery of a suitable fine to coarse sand matrix. Please refer to the Birchbank Eddy photos and field diary for reference.

Grab samples were transported to shore and relinquished under chain-of-custody protocol to Dr. Markus Hecker (Principal Investigator) and representatives of the University of Saskatchewan, Aquatic Exposure Laboratory. Samples were placed in a refrigerated truck maintained to approximately 4° C and transported to the University of Saskatchewan. Please refer to Attachment D for the chain-of-custodies.

## Deviations and Corrective Actions

The presence of a cobble and boulder river bottom cover precluded the ability to collect a competent sample from the Birchbank Eddy location.

No other reportable deviations, contingencies, or corrective actions required for this project phase as defined by the QAPP or SOPs.

## Attachments:

Table 1: Sample Coordinates

Map 1: Sediment Sample Locations

Figures 1-15: Site Photographs

Attachment A: Photographic Record

Attachment B: Field Data/Sampling Diaries

Attachment C: Environmental Field Book

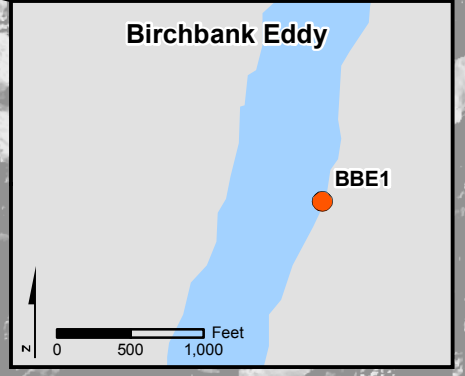
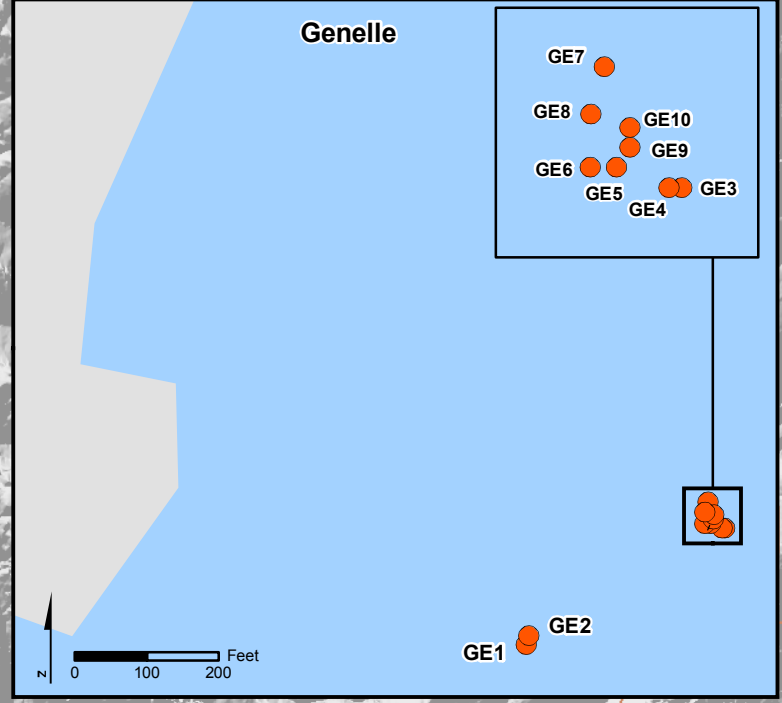
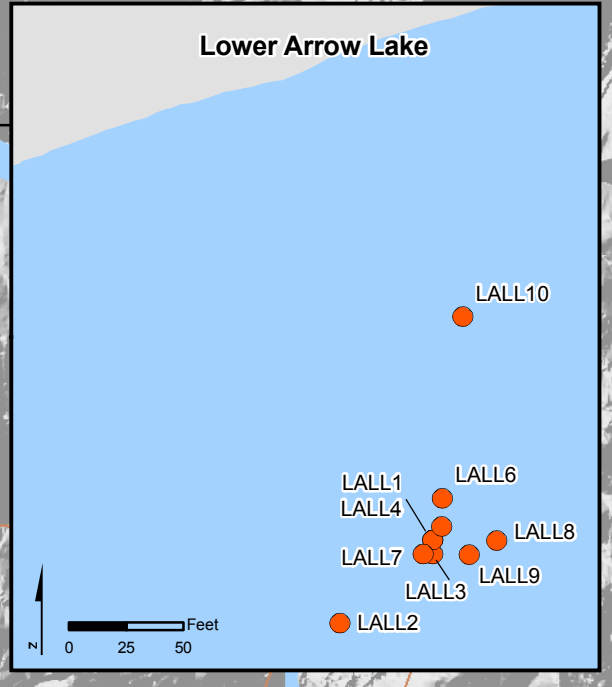
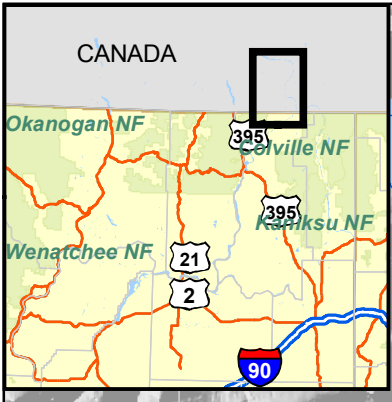
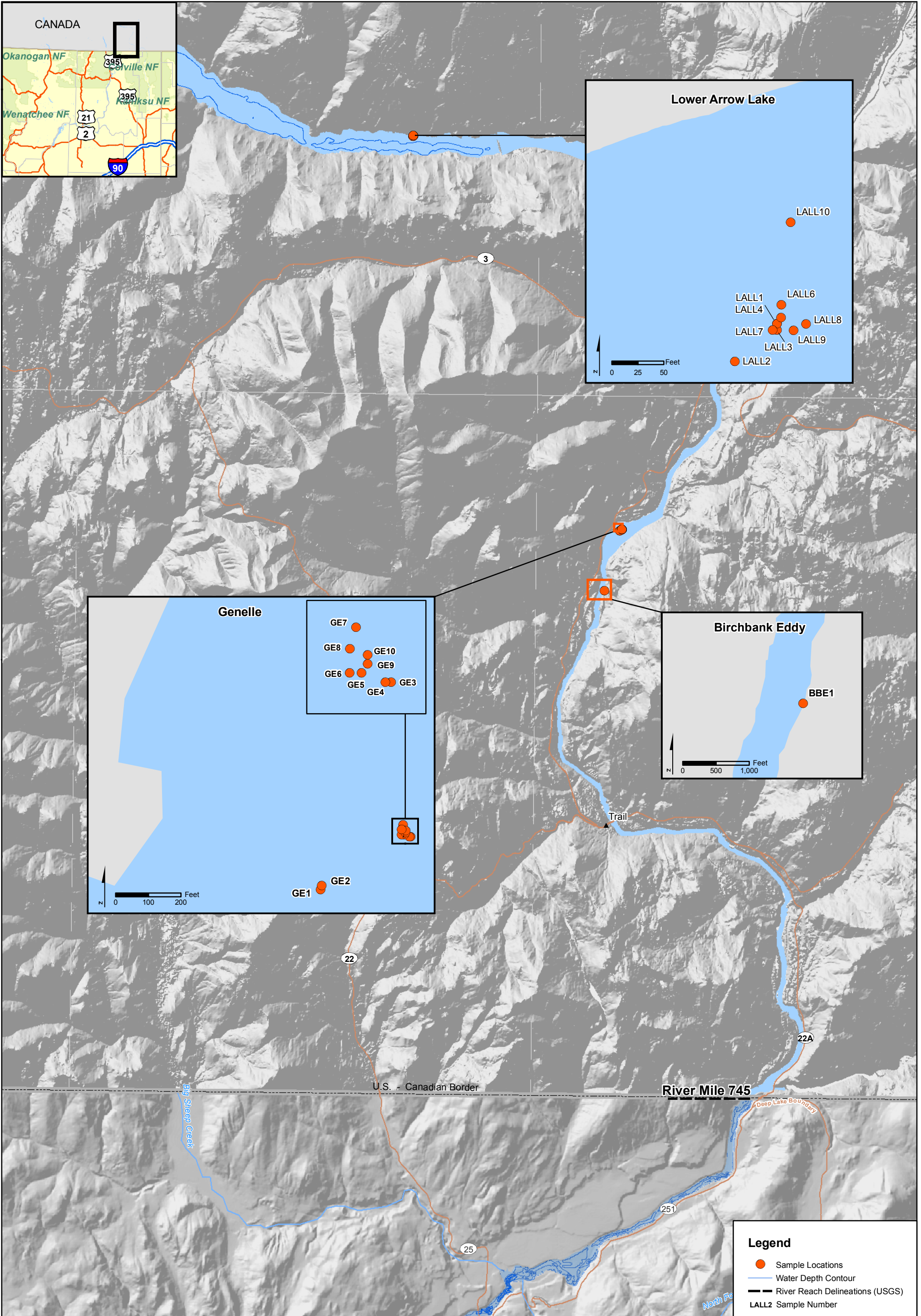
Attachment D: Chain-of-Custodies

**Table 1**  
**Sample Numbers and Coordinates**  
**Methods Development - White Sturgeon Sediment Toxicity Study**  
**Upper Columbia River - Birchbank Eddy, Genelle, and Lower Arrow Lake (Canada)**

Site Name	Sample No.	Container Tag No.	Northing (UTM) <sup>(2)</sup>	Easting (UTM)
Birchbank Eddy	TAI-CAN-BBE-1-PG-1	N/A <sup>1</sup>	5447789.379	448050.484
Genelle	TAI-CAN-GE-1-PG-1	GE1	5450155.375	448668.936
Genelle	TAI-CAN-GE-1-PG-2 <sup>3</sup>	GE2	5450159.069	448670.185
Genelle	TAI-CAN-GE-1-PG-3	GE3	5450204.621	448753.173
Genelle	TAI-CAN-GE-1-PG-4	GE4	5450204.632	448751.959
Genelle	TAI-CAN-GE-1-PG-5	GE5	5450206.530	448747.120
Genelle	TAI-CAN-GE-1-PG-6	GE6	5450206.553	448744.692
Genelle	TAI-CAN-GE-1-PG-7	GE7	5450215.805	448745.992
Genelle	TAI-CAN-GE-1-PG-8 <sup>3</sup>	GE8	5450211.445	448744.760
Genelle	TAI-CAN-GE-1-PG-9	GE9	5450208.371	448748.352
Genelle	TAI-CAN-GE-1-PG-10	GE10	5450210.224	448748.369
Lower Arrow Lake	TAI-CAN-LALL-1-PG-1	LALL1	5465801.313	440479.821
Lower Arrow Lake	TAI-CAN-LALL-1-PG-2	LALL2	5465790.327	440467.594
Lower Arrow Lake	TAI-CAN-LALL-1-PG-3	LALL3	5465799.460	440479.801
Lower Arrow Lake	TAI-CAN-LALL-1-PG-4	LALL4	5465801.313	440479.821
Lower Arrow Lake	TAI-CAN-LALL-1-PG-5	LALL5	5465803.152	440481.052
Lower Arrow Lake	TAI-CAN-LALL-1-PG-6	LALL6	5465806.858	440481.092
Lower Arrow Lake	TAI-CAN-LALL-1-PG-7	LALL7	5465799.473	440478.590
Lower Arrow Lake	TAI-CAN-LALL-1-PG-8	LALL8	5465801.221	440488.296
Lower Arrow Lake	TAI-CAN-LALL-1-PG-9	LALL9	5465799.407	440484.644
Lower Arrow Lake	TAI-CAN-LALL-1-PG-10	LALL10	5465830.918	440483.775

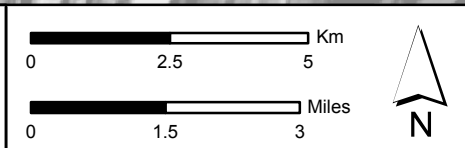
Notes:

- (1) Sample could not be collected because river bottom comprised of cobbles and boulders
- (2) Coordinates based on Universal Transverse Mercator (UTM) using North American Datum of 1983 (NAD83), Zone 11
- (3) Sample coordinates miss-recorded in field. Presented UTM coordinates have been corrected.



- Legend**
- Sample Locations
  - Water Depth Contour
  - River Reach Delineations (USGS)
  - LALL2 Sample Number

**Sediment Sample Locations**



**URS Corporation**  
 Source: GIS base layer information provided by Parametrix Inc.

**Map 1 Methods Development for the White Sturgeon Sediment Toxicity Study (Birchbank Eddy, Genelle, and Lower Arrow Lake) Upper Columbia River, Canada**



**FIGURES 1 through 15**  
**Site Photographs**



Figure 1  
Photograph of Birchbank Eddy Station, view to north. Note cobbly river bottom.



Figure 2  
Deployment of the Power Grab sediment sampling device, Birchbank Eddy Station, view to the north.



Figure 3  
Retrieval of Power Grab sediment sample at Birchbank Eddy Station, view to the north.



Figure 4  
Poor recovery at Birchbank Eddy Station. Note cobbles and absence of finer sediment material.

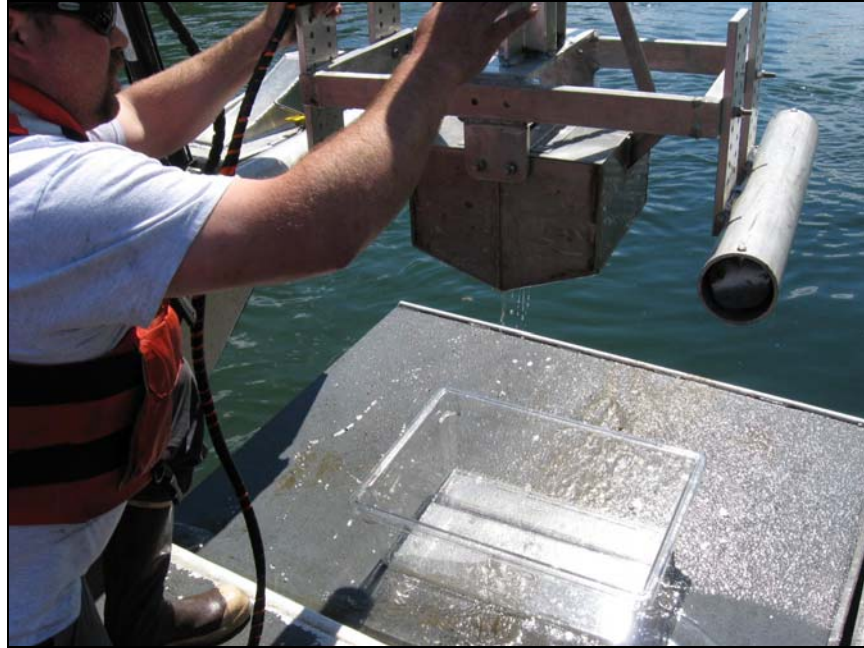


Figure 5  
Preparing to deposit Power Grab sediment grab sample into sample tray at the Genelle Station.



Figure 6  
Sediment grab sample following placement in sample tray at the Genelle Station.



Figure 7  
Close-up view of Genelle Station sediment grab sample.



Figure 8  
Transferring Genelle Station sediment grab sample from sample tray.



Figure 9  
Sediment grab sample number GE4 following placement in sample container, Genelle Station.



Figure 10  
Shoreline at Genelle Station, view toward east.



Figure 11  
Shoreline at Genelle Station, view to southeast.



Figure 12  
Sediment grab sample number LALL2 in sample tray, Lower Arrow Lake Station



Figure 13  
Sediment grab sample number LALL4 in sample tray, Lower Arrow Lake Station



Figure 14  
Close-up of grab sample number LALL4 in sample tray, Lower Arrow Lake Station





Figure 15  
Shoreline at Lower Arrow Lake Station, view to northeast

**ATTACHMENT A**  
**Photographic Record**  
**Provided on Compact Disc (CD)**

**ATTACHMENT B**  
**Field Data/Sampling Diaries**



STATION: <u>1</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE ✓	GE	LALL
DATE: <u>5.12</u> /2010			
WEATHER CONDITIONS: <u>Sunny, clear, 65 to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes: <u>No sample. No fine to coarse grain sands.</u>			

Station Reference UTM Coordinates

Lat	Easting:	<u>46 10.843</u>
Long	Northing:	<u>117 42.771</u>

Sample No.	TAI-CAN- <u>BBE</u> .1-PG- <u>1</u>
Container Tag No.	<u>NA</u>
Time	<u>12.39</u>
UTM Easting	<u>See Above</u>
UTM Northing	<u>"</u>
Field Photo No.	<u>UCR Birchbank Eddy</u>
Camera Image No.	<u>BBE_001 to BBE_021, Photo sequence</u> ← <u>sample Area</u>
Water Depth (cm)	<u>229 (7.5ft)</u>
Sampler Depth Penetration (cm)	<u>2 to 5 cm</u>
Sediment Texture (ASTM/Unified)	<u>GW, well graded gravels w/ cobbles &amp; boulders, little to no fines or sand</u>
Sediment Color (Munsell)	<u>Variable matrix parent material &amp; colors</u>
Odors	<u>No odors</u>
Leakage Disturbance	<u>Very poor recovery - unable to close sampler</u>
Abnormalities	<u>① Freshwater clam</u>
Other Notes	<u>Cobble to boulder sized material as river bottom. Sand limited to matrix interstices.</u>

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 5, 19 /2010  
 Time: 16:00


 FIELD DATA / SAMPLING DIARY  
 Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>1</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE ✓	LALL
DATE: <u>5, 12</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 65 to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
Eastings:	<u>49 12.123</u>
Northings:	<u>117 42.280</u>

Lat  
Long

Sample No.	<u>TAI-CAN-GE-1-PG-1</u>
Container Tag No.	<u>GE1</u>
Time	<u>1330</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Genelle</u>
Camera Image No.	<u>GE_001 to GE_006, Photo sequence - sampling, sample</u>
Water Depth (cm)	<u>179 (5.8 ft)</u>
Sampler Depth Penetration (cm)	<u>15 (5 to 6 in.)</u>
Sediment Texture (ASTM/Unified)	<u>SW - well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Grayish brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Minimal visible organic material - small wood particles on surface - removed as feasible</u>

 Sampler Name: Jeff Leppo

 Sample Signature: [Signature]

 Date: 5, 19 /2010

 Time: 19:02



STATION: <u>2</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE <input checked="" type="checkbox"/>	LALL
DATE: <u>5, 12</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 65 to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
Eastings:	<u>49 10.125</u>
Northings:	<u>117 42.279</u>

Lat  
Long

Sample No.	TAI-CAN- <u>GE</u> -1-PG - <u>2</u>
Container Tag No.	<u>GE2</u>
Time	<u>1400</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Genelle</u>
Camera Image No.	<u>GE-007 to GE-011</u>
Water Depth (cm)	<u>162 (5.3 ft)</u>
Sampler Depth Penetration (cm)	<u>15 (5 to 6 in.)</u>
Sediment Texture (ASTM/Unified)	<u>SW-well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Grayish brown</u> <u>to large</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery - cobbles present</u>
Abnormalities	<u>Small roots</u>
Other Notes	<u>Increase invisible organic matter - roots removed, as feasible.</u> <u>Move to center of eddy for next sample based on field observations.</u> <u>Few cobbles.</u>

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 5, 19 /2010  
 Time: 19:06



STATION: <u>3</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE ✓	LALL
DATE: <u>5 / 12 / 2010</u>			
WEATHER CONDITIONS: <u>Clear, sunny, 65 to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
East: <u>49 12.150</u>	North: <u>117 42.211</u>

Sample No.	TAI-CAN-GE-1-PG-3
Container Tag No.	GE3
Time	1450
UTM Easting	See above
UTM Northing	" "
Field Photo No.	UCR Genelle
Camera Image No.	GE_012 to GE_016
Water Depth (cm)	180 (5.9ft)
Sampler Depth Penetration (cm)	23 (8 to 10 in)
Sediment Texture (ASTM/Unified)	SW - well graded sands, little to no fines, few small gravels
Sediment Color (Munsell)	Grayish brown
Odors	None observed
Leakage Disturbance	Good recovery
Abnormalities	None observed
Other Notes	Good sample located close to middle of eddy. Little to no visible organic matter. Good place for remaining grab samples

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5 / 19 / 2010

Time: 19:07



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>4</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE <input checked="" type="checkbox"/>	LALL
DATE: <u>5, 12</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 65 to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates

Eastings:	<u>49 12.150</u>
Northings:	<u>117 42.212</u>

Lat  
Long

Sample No.	TAI-CAN- <u>GE-1-PG-4</u>
Container Tag No.	<u>GE4</u>
Time	<u>1508</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Genelle</u>
Camera Image No.	<u>GE-017 to GE-021</u>
Water Depth (cm)	<u>192 (6.3 ft)</u>
Sampler Depth Penetration (cm)	<u>27 (10 to 11 in)</u>
Sediment Texture (ASTM/Unified)	<u>SW - well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Grayish brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>No visible organic matter</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5, 19 /2010

Time: 1908





STATION: <u>5</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE <input checked="" type="checkbox"/>	LALL
DATE: <u>5/12</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 65 to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates

Easting:	<u>49 12.151</u>
Northing:	<u>117 42.216</u>

Lat/Long

Sample No.	<u>TAI-CAN-GE-1-PG-5</u>
Container Tag No.	<u>GE5</u>
Time	<u>1514</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>KR GENELLE</u>
Camera Image No.	<u>GE_022 to GE_024</u>
Water Depth (cm)	<u>228 (7.5 ft)</u>
Sampler Depth Penetration (cm)	<u>25 (10 in.)</u>
Sediment Texture (ASTM/Unified)	<u>SW-well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Grayish brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>No visible organic matter</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5/19 /2010

Time: 19:10



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>6</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE <input checked="" type="checkbox"/>	LALL
DATE: <u>5/12</u> /2010			
WEATHER CONDITIONS: <u>Clear, Sunny, 65 to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates

Eastings: <u>49 12.151</u>
Northings: <u>117 42.218</u>

Lat  
Long

Sample No.	TAI-CAN- <u>GE</u> -1-PG- <u>6</u>
Container Tag No.	<u>GEG</u>
Time	<u>1522</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Genelle</u>
Camera Image No.	<u>GE_025 to GE_027</u>
Water Depth (cm)	<u>177 (5.8ft)</u>
Sampler Depth Penetration (cm)	<u>28 (11 in.)</u>
Sediment Texture (ASTM/Unified)	<u>SW-well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Grayish brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>No visible organic matter.</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5/19 /2010

Time: 19:12



STATION: <u>7</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE <input checked="" type="checkbox"/>	LALL
DATE: <u>5, 12</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 65 to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
Easting:	<u>49 12.156</u>
Northing:	<u>117 42.217</u>

*Lat*  
*Long*

Sample No.	<u>TAI-CAN-GE-1-PG-7</u>
Container Tag No.	<u>GE7</u>
Time	<u>1535</u>
UTM Easting	<u>See above.</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Genelle</u>
Camera Image No.	<u>GE_031</u>
Water Depth (cm)	<u>182 (6.0 ft.)</u>
Sampler Depth Penetration (cm)	<u>25 (10 in.)</u>
Sediment Texture (ASTM/Unified)	<u>SW-well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Grayish brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Dark gray stringers w/in grayish brown color matrix. Possible evidence of different depositions or disturbance (natural)</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5, 19 /2010

Time: 19:4



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>8</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE ✓	LALL
DATE: <u>5/12</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates

<del>Easting:</del>	<u>49 12.066</u>
<del>Northing:</del>	<u>117 42.128</u>

*Let Long*

Sample No.	TAI-CAN- <u>GE-1-PG-8</u>
Container Tag No.	<u>GE8</u>
Time	<u>1541</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Genelle</u>
Camera Image No.	<u>GE-032</u>
Water Depth (cm)	<u>204 (6.7 ft.)</u>
Sampler Depth Penetration (cm)	<u>25 (10 in)</u>
Sediment Texture (ASTM/Unified)	<u>SW-well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Grayish brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>No visible organic matter.</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5/19 /2010

Time: 19:17



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>9</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE ✓	LALL
DATE: <u>5/12</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 70 to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates

Easting:	<u>49 12.152</u>
Northing:	<u>117 42.215</u>

Lst  
Long

Sample No.	TAI-CAN- <u>GE</u> -1-PG- <u>9</u>
Container Tag No.	<u>GE9</u>
Time	<u>1548</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR-Genelle</u>
Camera Image No.	<u>GE-033</u>
Water Depth (cm)	<u>179 (5.9 ft)</u>
Sampler Depth Penetration (cm)	<u>20 (8 in.)</u>
Sediment Texture (ASTM/Unified)	<u>SW - well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Grayish brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>No visible organic matter</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5/19 /2010

Time: 19:19



STATION: <u>10</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL
DATE: <u>5, 12</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 70-75°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates

Easting:	<u>49 12.153</u>
Northing:	<u>117 42.215</u>

Lat  
Long

Sample No.	<u>TAI-CAN-GE-1-PG-10</u>
Container Tag No.	<u>GE10</u>
Time	<u>1555</u>
UTM Easting	<u>See above.</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Genelle</u>
Camera Image No.	<u>GE_028 to GE_030, also GE_034 to GE_045</u> <sup>Area</sup> <sub>code</sub>
Water Depth (cm)	<u>192 (6.3 ft)</u>
Sampler Depth Penetration (cm)	<u>25 (10 in.)</u>
Sediment Texture (ASTM/Unified)	<u>SW - well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Grayish brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>No visible organic matter</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5, 12 /2010

Time: 19:13



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: 1	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: 5, 13 /2010			
WEATHER CONDITIONS: Clear, sunny, 60 to 65 °F			
SEDIMENT SAMPLER TYPE: Power Grab			
URS FIELD PERSONNEL: Gary Panther, Jeff Leppo			
Other Notes:			

Station Reference UTM Coordinates	
Eastings:	49 20.522
Northings:	117 49.164

Lat / Long

Sample No.	TAI-CAN-LALL-1-PG-1
Container Tag No.	LALL1
Time	0940
UTM Easting	See above
UTM Northing	" "
Field Photo No.	UCR-Lower Arrow Lake
Camera Image No.	LALL-01 to LALL-012. Photo Sequence at sampling & sample
Water Depth (cm)	207 (6.8 ft)
Sampler Depth Penetration (cm)	23 (8 to 10 in)
Sediment Texture (ASTM/Unified)	SW - well graded sands, little to no fines, few small gravels
Sediment Color (Munsell)	Light brown
Odors	No odors
Leakage Disturbance	Good recovery
Abnormalities	None observed
Other Notes	Some organic matter / litter on surface, overlying sand sediment

Sampler Name: Jeff Leppo  
 Sample Signature: *[Signature]*  
 Date: 5, 19 /2010  
 Time: 17:20



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>2</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: <u>5, 13</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 60 to 65°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates

Eastings:	<u>49 20.516</u>
Northings:	<u>117 49.174</u>

Lat  
Long

Sample No.	<u>TAI-CAN-LALL-1-PG-2</u>
Container Tag No.	<u>LALL2</u>
Time	<u>0950</u>
UTM Easting	<u>See above.</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR - Lower Arrow Lake</u>
Camera Image No.	<u>LALL-013 &amp; LALL-014</u>
Water Depth (cm)	<u>210 (6.9 ft)</u>
Sampler Depth Penetration (cm)	<u>23 (8 to 10 in)</u>
Sediment Texture (ASTM/Unified)	<u>SW-well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Light brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Limited organic matter/litter on sediment surface. Good sand samples.</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5, 19 /2010

Time: 19:21





STATION: <u>3</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: <u>5/13/2010</u>			
WEATHER CONDITIONS: <u>Clear, Sunny, 60 to 65°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
Eastings:	<u>49 20.521</u>
Northing:	<u>117 49.164</u>

Sample No.	TAI-CAN- <u>LALL-1-PG-3</u>
Container Tag No.	<u>LALL3</u>
Time	<u>1005</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR - Lower Arrow Lake</u>
Camera Image No.	<u>LALL-015</u>
Water Depth (cm)	<u>213 (7.0ft.)</u>
Sampler Depth Penetration (cm)	<u>28 (11 in)</u>
Sediment Texture (ASTM/Unified)	<u>SW - well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Light brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Little to no visible organic matter</u>

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 5/19 /2010  
 Time: 19:22



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>4</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: <u>5, 13</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 60 to 65°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates

Easting:	<u>49 20.522</u>
Northing:	<u>117 49.164</u>

Lat  
Long

Sample No.	<u>TAI-CAN-LALL-1-PG - 4</u>
Container Tag No.	<u>LALL4</u>
Time	<u>1013</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>See above</u>
Field Photo No.	<u>UCR Lower Arrow Lake</u>
Camera Image No.	<u>LALL-016 to LALL-018</u>
Water Depth (cm)	<u>201 (6.6 ft)</u>
Sampler Depth Penetration (cm)	<u>23 (8 to 10 in.)</u>
Sediment Texture (ASTM/Unified)	<u>SW-well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Light brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Little to no visible organic matter</u>

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 5, 19 /2010  
 Time: 19:23



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>5</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: <u>5/13</u>	/2010		
WEATHER CONDITIONS: <u>Clear, sunny, 60 to 65°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
Lat	Eastng: <u>49 20.523</u>
Long	Northng: <u>117 49.163</u>

Sample No.	<u>TAI-CAN-LALL-1-PG-5</u>
Container Tag No.	<u>LALL 5</u>
Time	<u>10 20</u>
UTM Easting	<u>See above.</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR - Lower Arrow Lake</u>
Camera Image No.	<u>LALL_019</u>
Water Depth (cm)	<u>219 (7.2 ft)</u>
Sampler Depth Penetration (cm)	<u>25 (10 in)</u>
Sediment Texture (ASTM/Unified)	<u>SW-well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Light brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Little to no visible organic matter.</u>

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 5/19 /2010  
 Time: 19:23



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>6</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: <u>5/13</u> /2010			
WEATHER CONDITIONS: <u>Clear, sunny, 65° to 70°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
Lat	Easting: <u>49 20.525</u>
Long	Northing: <u>117 49.163</u>

Sample No.	TAI-CAN- <u>LALL-1-PG-6</u>
Container Tag No.	<u>LALL6</u>
Time	<u>1030</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Lower Arrow Lake</u>
Camera Image No.	<u><del>222 (7.3ft)</del> 222 LALL_020 &amp; LALL_021</u>
Water Depth (cm)	<u><del>23 (8 to 10 in)</del> 222 (7.3 ft)</u>
Sampler Depth Penetration (cm)	<u>23 (8 to 10 in)</u>
Sediment Texture (ASTM/Unified)	<u>SW - well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Light brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Little to no visible organic matter.</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5/19 /2010

Time: 19:24



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>7</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: <u>5/13/2010</u>			
WEATHER CONDITIONS: <u>Partly cloudy, 65°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
Eastings: <u>49 20.521</u>	Long
Northing: <u>117 49.165</u>	

Sample No.	TAI-CAN- <u>LALL-1-PG-7</u>
Container Tag No.	<u>LALL7</u>
Time	<u>1043</u>
UTM Easting	<u>See above.</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Lower Arrow Lake</u>
Camera Image No.	<u>LALL-022</u>
Water Depth (cm)	<u>229 (7.5 ft.)</u>
Sampler Depth Penetration (cm)	<u>23 (8 to 10 in)</u>
Sediment Texture (ASTM/Unified)	<u>SW - well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Light brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Little to no visible organic matter.</u>

Sampler Name: \_\_\_\_\_

Sample Signature: \_\_\_\_\_

Date: \_\_\_\_\_ / \_\_\_\_\_ /2010

Time: \_\_\_\_\_



STATION: <u>8</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: <u>5, 13</u> /2010			
WEATHER CONDITIONS: <u>Partly cloudy, 60-65°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
Eastings: <u>49 20.522</u>	Long. Northing: <u>117 49.157</u>
Northings:	

Sample No.	TAI-CAN- <u>LALL-PG-8</u>
Container Tag No.	<u>LALL8</u>
Time	<u>1055</u>
UTM Easting	<u>See above.</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Lower Arrow Lake</u>
Camera Image No.	<u>LALL-023 to LALL-029 Photo sequence of sample and area</u>
Water Depth (cm)	<u>232 (7.6 ft)</u>
Sampler Depth Penetration (cm)	<u>23 (9 in)</u>
Sediment Texture (ASTM/Unified)	<u>SW - well graded sands, little to no fines, few to med. <sup>small</sup> gravels</u>
Sediment Color (Munsell)	<u>Light brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Two grab efforts, poor recovery on first grab</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Little to no visible organic matter. Matrix more variable with increase in gravel size. Need to move to concentrate on more uniform sand matrix.</u>

Sampler Name: Jeff Leppo  
 Sample Signature: [Signature]  
 Date: 5, 19 /2010  
 Time: 19:27



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: 9	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: 5, 13 /2010			
WEATHER CONDITIONS: Partly cloudy, cool, 55 to 60°F			
SEDIMENT SAMPLER TYPE: Power Grab			
URS FIELD PERSONNEL: Gary Panther, Jeff Leppo			
Other Notes:			

Station Reference UTM Coordinates

Easting:	49 20.521
Northing:	117 49.160

Lat  
Long

Sample No.	TAI-CAN- LALL-1-PG - 9
Container Tag No.	LALL 9
Time	1105
UTM Easting	See above
UTM Northing	" "
Field Photo No.	UCR Lower Arrow Lake
Camera Image No.	LALL-030
Water Depth (cm)	222 (7.3ft)
Sampler Depth Penetration (cm)	23 (9 in.)
Sediment Texture (ASTM/Unified)	SW - well graded sands, little to no fines, few small gravels
Sediment Color (Munsell)	Light brown
Odors	None observed
Leakage Disturbance	Good recovery
Abnormalities	None observed
Other Notes	Little to no visible organic matter

Sampler Name: \_\_\_\_\_

Sample Signature: \_\_\_\_\_

Date: 5 / 13 /2010

Time: \_\_\_\_\_



FIELD DATA / SAMPLING DIARY  
Upper Columbia River - White Sturgeon Sediment Toxicity Study

STATION: <u>10</u>	BIRCHBANK EDDY	GENELLE	LOWER ARROW LAKE
STATION CODE:	BBE	GE	LALL ✓
DATE: <u>5, 13</u> /2010			
WEATHER CONDITIONS: <u>Partly cloudy, 55 to 60°F</u>			
SEDIMENT SAMPLER TYPE: <u>Power Grab</u>			
URS FIELD PERSONNEL: <u>Gary Panther, Jeff Leppo</u>			
Other Notes:			

Station Reference UTM Coordinates	
Lat	Easting: <u>49 20.538</u>
Long	Northing: <u>117 49.161</u>

Sample No.	TAI-CAN- <u>LALL-1-PG-10</u>
Container Tag No.	<u>LALL10</u>
Time	<u>1110</u>
UTM Easting	<u>See above</u>
UTM Northing	<u>" "</u>
Field Photo No.	<u>UCR Lower Arrow Lake</u>
Camera Image No.	<u>LALL-031 to LALL-035. Photo sequence of sample area CofC</u>
Water Depth (cm)	<u>216 (7.1 ft.)</u>
Sampler Depth Penetration (cm)	<u>25 (10 in)</u>
Sediment Texture (ASTM/Unified)	<u>SW- well graded sands, little to no fines, few small gravels</u>
Sediment Color (Munsell)	<u>Light brown</u>
Odors	<u>None observed</u>
Leakage Disturbance	<u>Good recovery</u>
Abnormalities	<u>None observed</u>
Other Notes	<u>Little to no visible organic matter</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5, 19 /2010

Time: 19:28



**ATTACHMENT C**  
**Environmental Field Book**

"Rite in the Rain"®  
ALL-WEATHER WRITING PAPER



ALL-WEATHER  
ENVIRONMENTAL FIELD BOOK

Name Jeff Leppo } URS Corp.  
Gary Panther } Spokane, WA  
Address 920 N. Argonne Rd  
Suite 300 Spokane 99212  
Phone (509) 928 4413

Project UCR  
White Sturgeon Sediment  
Toxicity Study

36310054.00601

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

Specifications for this book:

Page Pattern		Cover Options	
Left Page	Right Page	Polydura Cover	Fabrikoid Cover
Columnar	1/4" Grid	N/A	Item No. 550-4F

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CONTENTS

PAGE	REFERENCE	DATE
	4 to 10 Birchbank Eddy and Genelle sediment Sampling record	5/12/10
	11 to 12 Lower Arrow Lake Sediment sampling record	5/13/10

Reference Page Index

- 67 Error codes, Hazardous classifications, Container types
- 68 Sampling guidelines (Liquids)
- 69 Sampling guidelines (Solids)
- 70 Approximate Volume of Water in Casing or Hole, Ground Water Monitoring Well
- 71 PVC Pipe casing tables
- 72 Soil Classification
- 73 Soil Classification
- 74 Conversions (Length, Weight, Volume, Temp, etc...)
- 75 Conversions (Concentrations, Volume/Flow or Time, Velocity, Acceleration)
- 76 Maximum Concentration of Contaminants for the Toxicity Characteristic

### CONTENTS

PAGE	REFERENCE	DATE

Location \_\_\_\_\_ Date \_\_\_\_\_

Project / Client \_\_\_\_\_


Teck Contact: David Espenhain  
 250. 231.0104  
 \_\_\_\_\_ *D. Espenhain*

Start  
 Page 4: →

4

Location Trail Boat Launch Date 5/12/10Project / Client UCR - SedimentJeff Leppo, Gary Panther

8:00 Boat launch in trail - meet w/  
Markus + crew. Discuss final protocol.  
Markus is worried that we do not have  
HPCR bags for buckets - calls Marko -  
will deliver buckets.  
Discuss COCS - will use COCS w/  
Carbon for 1<sup>st</sup> location

Launch 30M Boats - Load Gear -

0855

Ⓟ Photo No. 1 - Boat @ Launch  
Clearwater (Gravity Environmental)

Boats: Monarch, Eric Weatherman  
& Columbia Navigation  
Captains  
Clearwater, Shawn Hinz  
Gravity Environmental

Location Trail Boat Launch Date 5/12/10 5Project / Client UCR - SedimentOther Persons @ Dock

- \* Markus Hecker - ENTRIX and Univ. of Saskatchewan
- \* Jonathan Doering - UotS
- \* Jeff Dronsam - UotSask Thomson
- \* Renee Trudeau - Gravity Environmental
- \* Allen Burkhardt - Columbia

0915 Weather: Clear skies, 55°F  
Dry conditions.

Gravity

10:10 Work continues w/  
hydraulics for power grab.

Sampler

- \* Prep Dean setup for buckets. Markus/Marko Adzio  
Bucket deconn procedure  
agreed on under QAPP SOP

6

Location Trail Boat Launch Date 5/12/10  
 Project / Client UCR Sediment Sample

10:30 Shawn & Eric go to pick up parts for pulley / pump on powergrab.

11:24 H & S Tailgate Mtg  
 Fire Ext, Trips & Falls, Hydr Systems, helmets & crowns  
 A Frame, man-overboard

11:35 Leave Gyro Park Boat Launch, head up river

11:50 Arrive @ Birchbank Eddy  
 1st Locatn  
 Rocky bottom - cobble and boulder sized materials on river bottom.  
 Extends over area into deeper water, and up the bank

Lat<sup>N</sup> 49 10.619 1st Site  
 Long<sup>W</sup> 117.42.915 Exam

7

Location Birch Bank Eddy Date 5/12/10  
 Project / Client UCR Sediment

12:00 Discuss cobble / boulder. Sand filled interstices, between rocks  
 Difficult to gather significant sand sample

2nd Location @ Birchbank - review

N 49 10.637

W 117 42.877

- same bottom, cobbles & boulders w/ limited sand interstices

(Collect / Take Photos)

River Sounding - out to 14 ft depth appears cobbles & boulders

12:10 or less. low visibility

3rd Location 7.5 ft depth

N 46 10.843

W 117 42.771

Setup to collect sample

8

Location Birchbank Eddy Date 5/12/10  
 Project / Client to Genelle  
UCR Sediment

Birchbank Eddy - 3rd Location  
 Setup for power-grob sampler  
 See grob sample no. TAI-CAN-BBE-1-PG-1  
 - cobbles, gravels with sand

12:50 Markus & crew agree to move  
 and forego BBE sample  
 due to bottom matrix

12:55 Move to Genelle

13:15 Arrive @ Genelle. Identify  
 sand bottom sediments, mixed  
 with other areas of gravel/sand  
 mixtures. Within eady between  
 river courses.

Start Sampling - See Field Diary

9

Location Genelle Date 5/12/10  
 Project / Client to Trail Boat Launch  
UCR Sediment

16:05 Complete sediment sampling  
 @ Genelle. Good recoveries  
 w/ well graded sands. Collect  
 all 10 grob samples from  
 TAI-CAN-GE-1-PG-1 ~~PL~~  
 TAI-CAN-GE-1-PG-10  
 Containers GE1 to GE10

Agreed Upon - Marko & Markus  
 \*Liquinox, then river water  
 rinse was field approved  
 following discussion of the  
 use of liners / no liners

16:55 Finish w/ sample  
 & decon. Prep for  
 move back down to  
 Trail Boat Launch

10

Location Trail Boat Launch Date 5/12/10Project / Client UCR Sediment

1720 - Arrive back @ Trail Boat Launch

Work w/ Markus on QA/QC of sample labels, date/time numbers etc.

Prep. COCs

1740 - Sign & relinquish Chain of Custody with Jonathan Doering, Univ. of Saskatchewan.

- take photo for copy  
Gravity Env. Crew doing boat cleanup & maintenance

1800 Leave site, head to motel

1815 - Arrive @ hotel

Lower Arrow Lake

Location \_\_\_\_\_ Date 5/13/10 11Project / Client UCR Sediment

0845 - Arrive @ Arrow Lake

Personnel - see notes from 5/12/10 } same

Boats - see notes from 5/12/10 }

mobilization & Safety Meeting

0910 - Start up boats, prep for departure

Head out to sediment sample point

0930 Decon power grab, lexan

tray & all bucket interiors w/ water rinse, liguinox scrub & water rinse.

1110 - collect last grab sample  
LALL10

1120 - Finish up w/ sample

platform work - cleanup/decon

Head to dock

1135 Return to dock

1150 - Complete CoC

relinquish to Jon Doering

12

Location Lower Arrow Lake Date 5/13/10Project / Client UCR Sediment

Camera/photo copies to:

Jonathon Doering

jad929@mail.usask.ca

306-270-3372 (cell)

306-966-4223 (office)

4557

1220 - Call Marko w/ update/status

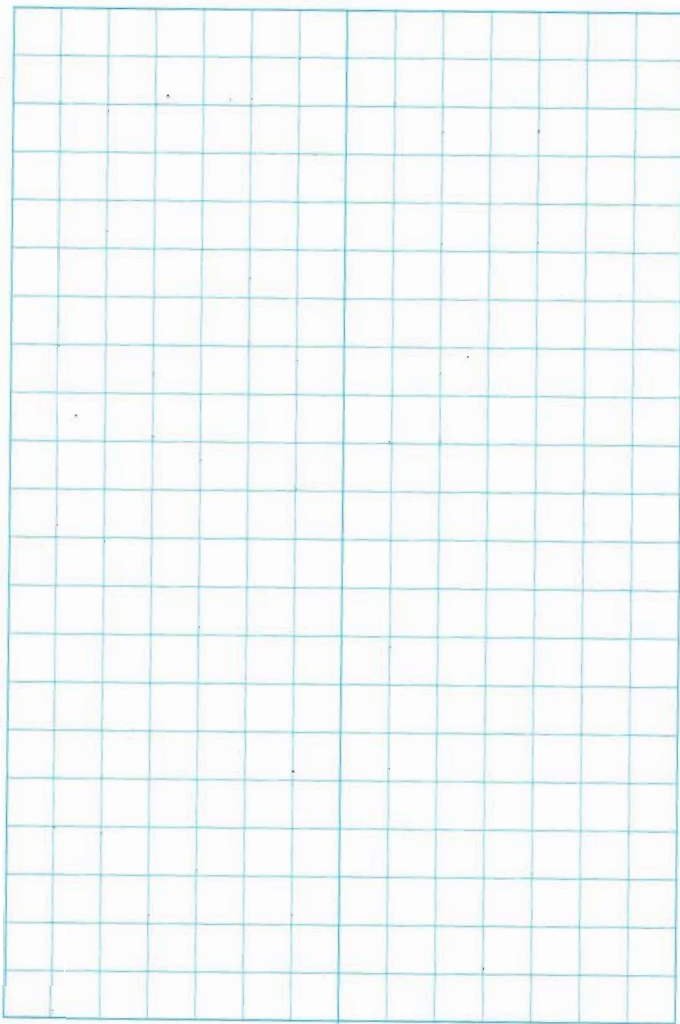
1230 - Crews finish up  
demob, head home.

\* See field diaries for  
reference sediment sample  
site observations, sample  
into/descriptions, and  
locations

13

Location \_\_\_\_\_ Date \_\_\_\_\_

Project / Client \_\_\_\_\_





**ATTACHMENT D**  
**Chain-of-Custody**



Client: **Teck American Incorporated**  
 501 North Riverpoint Blvd, Ste 300  
 Spokane, WA 99202

Project Manager: **Kris McCaig, kris.mccaig@teck.com**

**CHAIN of CUSTODY**

Project: **Upper Columbia River - White Sturgeon Sediment Toxicity Study**  
 Telephone No. 509-459-4451 Fax No. 509-459-4400  
 P.O. #

Method of Shipment

TAT: Standard  
 Per QAPP, April 2010

Sample I.D.	Container Tag No.	No. of Containers	Matrix	Sampling Date	Sampling Time	Analytical/Physical Parameters		Notes and Comments	Reference Location
						Upper Columbia River - Quality Assurance Project Plan Methods Development for the White Sturgeon Sediment Toxicity Study, April 2010			
TAI-CAN-GE-1-PG -1	GE1	1	Sed	5/12/10	1330	✓		<i>Samplers: Jeff Leppo / Gary Panther - URS Corp (Spokane)</i>	<b>GENELLE</b>
TAI-CAN-GE-1-PG -2	GE2	1	Sed	5/12/10	1400	✓			
TAI-CAN-GE-1-PG -3	GE3	1	Sed	5/12/10	1450	✓			
TAI-CAN-GE-1-PG -4	GE4	1	Sed	5/12/10	1508	✓			
TAI-CAN-GE-1-PG -5	GE5	1	Sed	5/12/10	1514	✓			
TAI-CAN-GE-1-PG -6	GE6	1	Sed	5/12/10	1522	✓			
TAI-CAN-GE-1-PG -7	GE7	1	Sed	5/12/10	1535	✓			
TAI-CAN-GE-1-PG -8	GE8	1	Sed	5/12/10	1541	✓			
TAI-CAN-GE-1-PG -9	GE9	1	Sed	5/12/10	1548	✓			
TAI-CAN-GE-1-PG -10	GE10	1	Sed	5/12/10	1555	✓			
Sample Received Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>									REFERENCE UTM COORDINATES EASTING <b>448723.51</b> NORTHING <b>5450261.18</b> <i>Coordinates for QAPP Reference only. Please refer to Field Diaries for Lat/Long data for each grab sample.</i>
Relinquished by: <i>Jeffrey E. Leppo</i>						Sample Receiving Notes: <i>(Donathon Doering)</i>			
Date: <i>5/12/10</i>						Time: <i>1735</i>			
Relinquished by:						<i>5/12/10 1735 received by JD</i>			
Date:						Time:			
Relinquished by:						Date:			
Date:						Time:			



Client: **Teck American Incorporated**  
 501 North Riverpoint Blvd, Ste 300  
 Spokane, WA 99202

Project Manager: **Kris McCaig, kris.mccaig@teck.com**

**CHAIN of CUSTODY**

Page 1 of 1

Method of Shipment

TAT: Standard  
 Per QAPP, April 2010

Project: **Upper Columbia River - White Sturgeon Sediment Toxicity Study**

Telephone No. 509-459-4451 Fax No. 509-459-4400

P.O. #

Sample I.D.	Container Tag No.	No. of Containers	Matrix	Sampling Date	Sampling Time	Analytical/Physical Parameters		Notes and Comments
						Upper Columbia River - Quality Assurance Project Plan Methods Development for the White Sturgeon Sediment Toxicity Study, April 2010		
TAI-CAN-LALL-1-PG -1	LALL1	1	Sed	5/13/10	0940	✓		Fieldsamplers - Jeff Leppo and Gary Panther
TAI-CAN-LALL-1-PG -2	LALL2	1	Sed	5/13/10	0950	✓		
TAI-CAN-LALL-1-PG -3	LALL3	1	Sed	5/13/10	1005	✓		
TAI-CAN-LALL-1-PG-4	LALL4	1	Sed	5/13/10	1013	✓		
TAI-CAN-LALL-1-PG-5	LALL5	1	Sed	5/13/10	1020	✓		
TAI-CAN-LALL-1-PG-6	LALL6	1	Sed	5/13/10	1030	✓		
TAI-CAN-LALL-1-PG -7	LALL7	1	Sed	5/13/10	1043	✓		
TAI-CAN-LALL-1-PG -8	LALL8	1	Sed	5/13/10	1055	✓		
TAI-CAN-LALL-1-PG -9	LALL9	1	Sed	5/13/10	1105	✓		
TAI-CAN-LALL-1-PG -10	LALL10	1	Sed	5/13/10	1110	✓		

Reference Location

**LOWER ARROW LAKE**

REFERENCE UTM COORDINATES

EASTING  
435940

NORTHING  
5466319

UTM coordinates for reference only. From UCR QAPP White Sturgeon Sediment Toxicity Test 5

Sample Received Intact: Yes No

Relinquished by: *Jeff Leppo* Jeffrey E. Leppo Date: 5/13/10 Time: 1205

Relinquished by: Date: Time:

Relinquished by: Date: Time:

Relinquished by: Date: Time:

Sample Receiving Notes:

Received By: *Jonathan Downing* 5/13/10 1205

Date: Time:

Date: Time:

## **APPENDIX C-3**

---

FIELD REPORT AND RECORDS

ON-SHORE SEDIMENT SAMPLING

DEADMAN'S EDDY, UCR, STEVENS COUNTY, WA

METHODS DEVELOPMENT FOR THE

WHITE STURGEON SEDIMENT TOXICITY STUDY

JUNE 24, 2010 MEMORANDUM



# MEMORANDUM

---

**TO:** Marko Adzic, Teck American Incorporated  
**FROM:** Jeffrey E. Leppo, LG  
**DATE:** June 24, 2010  
**FILE:** 36310054.00002  
**SUBJECT:** Field Report and Records – On-Shore Sediment Sampling  
Deadman’s Eddy, Upper Columbia River, Stevens County, Washington  
Methods Development for the White Sturgeon Sediment Toxicity Study

---

## Introduction

URS Corporation (URS) conducted field services for Teck American Incorporated (Teck) along the Upper Columbia River (UCR) at Deadman’s Eddy (DME). Specifically, on-shore sediment samples were collected from the gravel bar at Deadman’s Eddy located in Stevens County, Washington, on May 27, 2010. The field services scope of work was based on the requirements and standard operating procedures (SOP) outlined within the *Quality Assurance Project Plan – Methods Development for the White Sturgeon Sediment Toxicity Study* (QAPP) prepared for Teck in April 2010.

Records attached to this memorandum include:

- Sediment Sample Locations, Methods Development for the White Sturgeon Sediment Toxicity Study – Deadman’s Eddy (Map 1).<sub>2</sub>
- Sample Location and Coordinates table (Attachment A)
- Field Data/Sampling Diary sheets for each sample location and station (Attachment B)
- Photocopy of the hard-bound Environmental Field Book daily record (Attachment C)
- Photographs of the locations, general sampling procedures, and grab samples (Attachment D)
- Archaeological monitoring results (Attachment E)
- Chain-of-custody and shipment records for May 27, 2010 surface grab samples (Attachment F)

## Scope of Work

The DME location is identified within the QAPP (April 2010) as approved by the U.S. Environmental Protection Agency (EPA) and delineated within four coordinates under the Universal Transverse Mercator (UTM) system using North American Datum for 1983 (NAD83, Zone 11). The four UTM corner coordinates are identified as:

- Northeast Corner –Easting (447158), Northing (5421097)
- Southeast Corner –Easting (447077), Northing (5421068)
- Southwest Corner –Easting (447023), Northing (5421127)
- Northwest Corner –Easting (447026), Northing (5421144)



## MEMORANDUM

Marko Adzic, Teck American Incorporated

June 24, 2010

Page 2 of 4

The four UTM corner coordinates were located using a consumer-grade, hand-held Global Positioning System (GPS) unit (Magellan Triton) and marked using wooden stakes. See Figures 1 through 4. The following methods were used to locate and provide documentation for each on-shore surface grab sample.

- Based on field observations of the sediment composition a transect line was laid between the northeast and northwest corners using a string marker.
- The distance between the two corners was measured by tape as 458 feet (139.5 meters). Based on this measured distance, the transect was divided into 50 foot (15.2 meter) increments or ten reference points, with a total transect distance of 450 feet (137.2 meters). The 10 reference points were labeled A (northeast corner) to J (northwest corner).
- The 10 grab sample points were located at various distances in the sand sediments south of the 50 foot transect reference points and marked with flags. Two grab samples were collected south of transect reference point E, as the reference point A (northeast corner) sediment material was comprised of cobbles and boulders. UTM coordinates and elevations were recorded using the hand-held GPS unit for each flagged grab sample point. Attachment A provides the individual grab sample location data.
- Each of the 10 grab samples were collected using a decontaminated shovel and placed into decontaminated polyethylene (PE) 5-gallon bucket. The upper 4 inches (10 centimeters) of sediment was removed to access the underlying sample area. Grab samples were generally collected between 4 and 12 inches (30 centimeters) below the ground surface; 12 inches being the maximum depth prescribed by the QAPP. Unique sample numbers and container numbers were assigned based on QAPP SOP-4. See Figures 5 and 6
- Sample data and observations were recorded on field sample logs (Attachment B). The field sample logs include information on the sample time, UTM coordinates, sample texture and colors, general characteristics, photographic record, and other relevant notes. A bound environmental field book (Attachment C) was used to record general information regarding project personnel, activities, and operations.
- Photographic documentation was collected (Attachment D). Photographs of the locations, samples, and procedures are sequentially identified using a white board marker to record pertinent information (e.g., time, date, and location). The photograph directory is labeled TAI-DME 5\_27\_2010. The photographs are labeled IMG\_0001 to IMG\_0091. The individual grab sample photographs (numbers) are recorded on the field sample logs for reference.
- Archaeological monitoring of ground-disturbing activities was conducted by a qualified archaeologist who meets the U.S. Secretary of Interior's Professional Qualification Standards (as outlined in 36 CFR Part 61). The DME sediment sampling program was monitored by a URS Registered Professional Archeologist (RPA) Sarah McDaniel, RPA in



## MEMORANDUM

Marko Adzic, Teck American Incorporated

June 24, 2010

Page 3 of 4

accordance with protocols outlined in Appendix C of the QAPP (April 2010). Ms. McDaniel's archaeological monitoring results are provided in Attachment E.

### Field Observations

The field sampling event was attended by the following persons:

#### Sampling and Support

- Eric Weatherman, Captain, Columbia Navigation, Inc.
- Alan Burkhart, Columbia Navigations, Inc.
- Sarah McDaniel, RPA, URS Corporation
- Jeffrey E. Leppo LG, URS Corporation

#### Observers

- Joseph Wichmann, PhD, Technical Advisor, representing Citizens for a Clean Columbia
- Steve Demus, CH2M Hill, providing EPA technical oversight

Figure 5 shows sampling, support, and observer personnel present on May 27, 2010 (Jeffery Leppo is not present in the photograph). The DME location is situated on the west side of the Columbia River and is a depositional sediment bar comprised primarily of sands, gravels, cobbles and boulders. Figures 6 and 7 present surface conditions at DME. Ten sediment grab samples (five gallons each) were obtained from within the DME sampling area delineated by the four corner markers. The primary sample matrix consisted of dark gray and yellowish brown well-graded sands. The presence of buried cobbles and boulders was encountered at several locations at depths ranging from 5 to 8 inches (13 to 20 cm) below ground surface; in these instances the sand sediments were collected above these materials. Figures 8 and 9 present typical grab sample collection activities.

The ten sediment grab samples were labeled TAI-US-DME-HS-1 through TAI-US-DME-HS-10 and are illustrated within Map 1. The corresponding container tag numbers were DME-1 through DME-10. Grab samples were transported by vehicle to Spokane, Washington under chain-of-custody protocol and delivered to representatives of Teck on May 28, 2010. The grab samples were then transported by Teck to the Teck Metals, Ltd facility in Trail, British Columbia, Canada, with subsequent shipping to the University of Saskatchewan, Aquatic Exposure Laboratory. Please refer to Appendix F for the chain-of-custody and shipping documents.

The archaeological monitoring reported no cultural resources were identified or disturbed as a result of this on-shore sediment sampling program.

A benchmark at the Northport (WA) boat launch was established as a reference point for both UTM coordinates and elevation data. The data is entered into the Environmental Field Book, page 1. Photographs IMG\_001 and IMG\_002 provide a view of the location.



## MEMORANDUM

Marko Adzic, Teck American Incorporated

June 24, 2010

Page 4 of 4

### **Deviations and Corrective Actions**

No reportable deviations, contingencies, or corrective actions were required for this project phase as defined by the QAPP or SOPs.

### **Attachments:**

Figures 1-9: May 27, 2010 Site Photographs  
Map 1: Sediment Sample Locations  
Attachment A: Sample Locations and Coordinates Table  
Attachment B: Field Data/Sampling Diaries  
Attachment C: Environmental Field Book  
Attachment D: Photographic Record  
Attachment E: Archaeological Monitoring Results  
Attachment F: Chain-of-Custody





Figure 1  
Photograph of the northeast corner coordinate, view to west



Figure 2  
Southeast corner coordinate, view to southeast.



Figure 3  
Southwest corner coordinate, view to northeast.



Figure 4  
Northwest corner coordinate, view to northwest.



Figure 5  
Sampling and support, and observer personnel, view to east.



Figure 6  
Deadman's Eddy surface conditions, view to northwest.



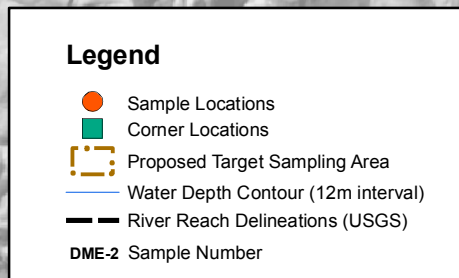
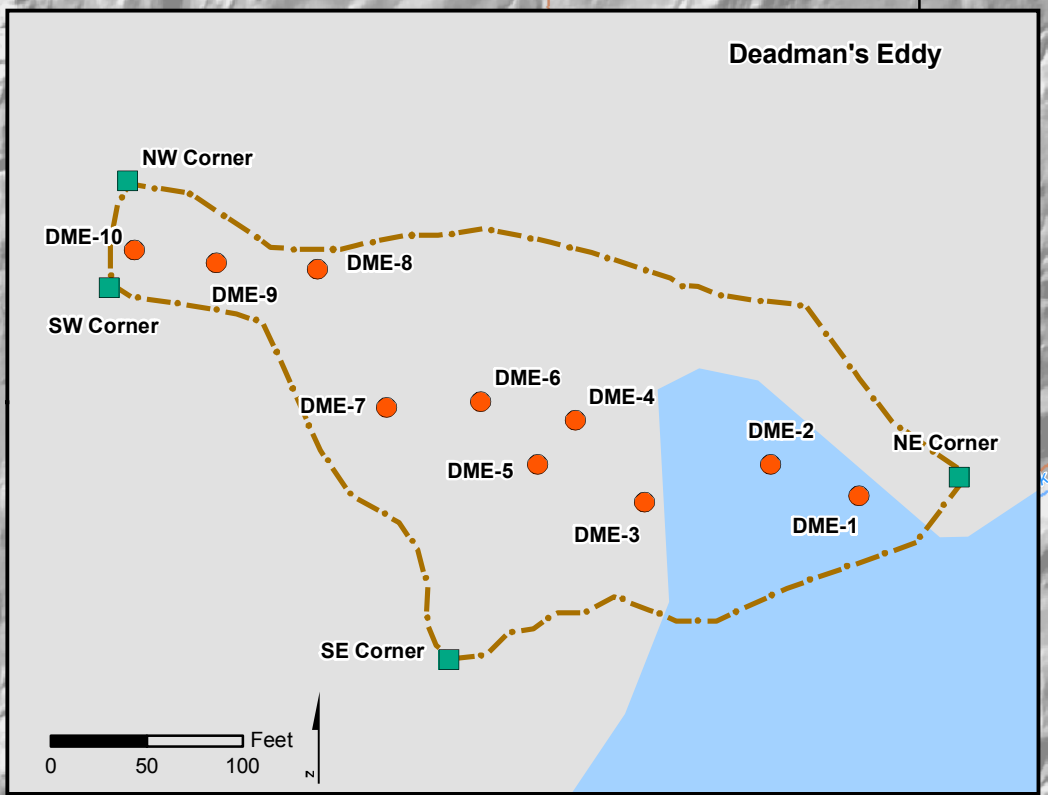
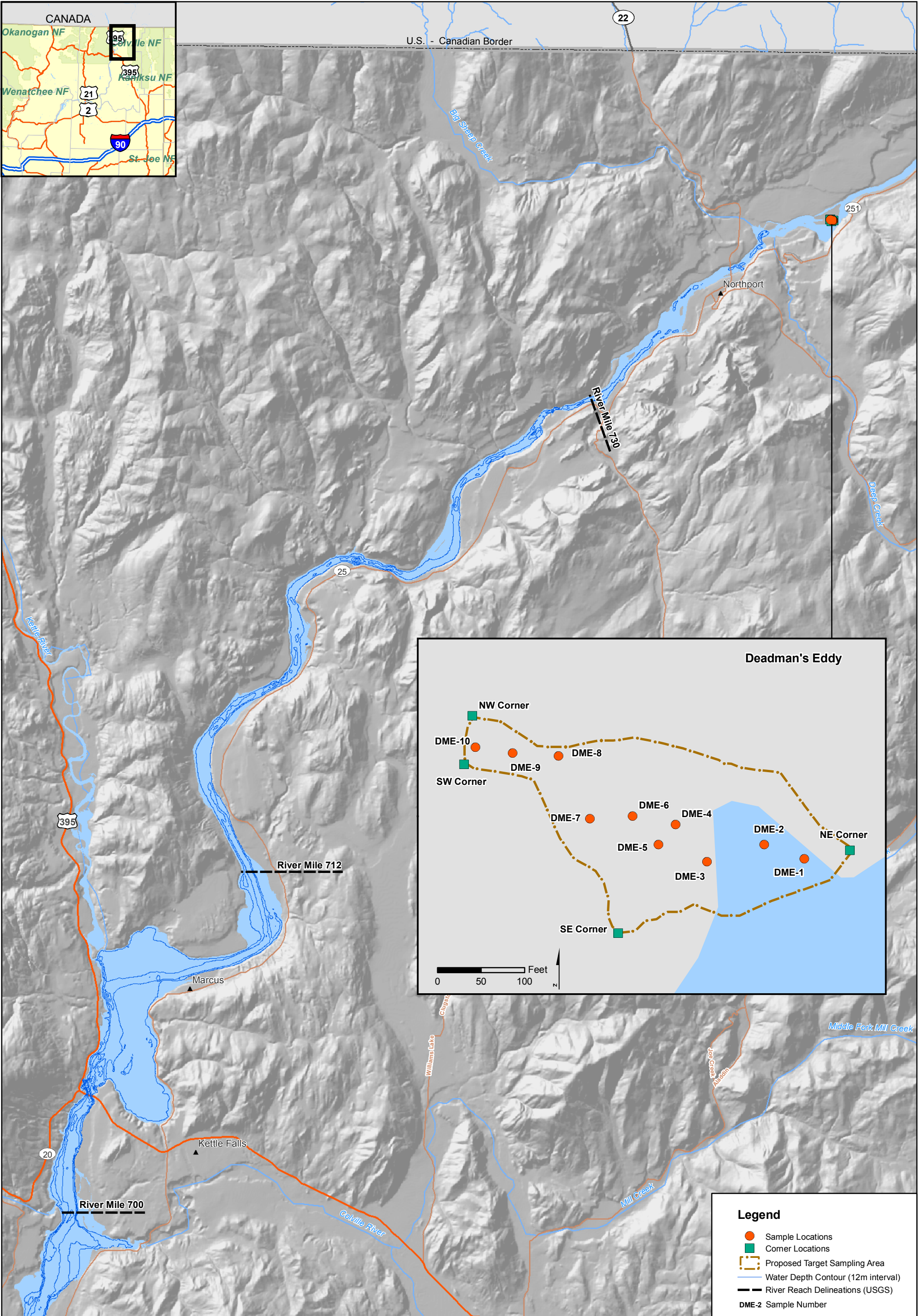
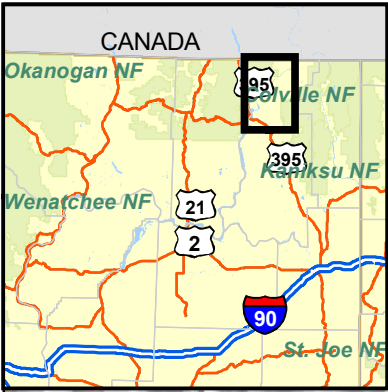
Figure 7  
Deadman's Eddy surface conditions, view to south



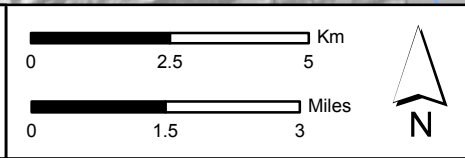
Figure 8  
Grab sample collection, sample number TAI-US-DME-HS-1, view to northeast.



Figure 9  
Grab sample test pit, sample number TAI-US-DME-HS-1.



**Sediment Sample Locations**



**URS Corporation**  
 Source:  
 GIS base layer Information  
 provided by Parametrix Inc.

**Map 1 Methods Development for the  
 White Sturgeon Sediment Toxicity Study  
 (Deadman's Eddy)  
 Upper Columbia River, WA**

**ATTACHMENT A**  
**Sample Locations and Coordinates Table**

**Sample Locations and Coordinates**  
**Methods Development - White Sturgeon Sediment Toxicity Study**  
**Upper Columbia River - Deadman's Eddy (U.S.)**

**Attachment A**

<b>Sample Container Tag No.</b>	<b>Reference Point</b>	<b>Reference Point Distance from NE to NW Corner (m) <sup>(1) (2)</sup></b>	<b>Northing (UTM) <sup>(3)</sup></b>	<b>Easting (UTM)</b>	<b>Elevation (m)</b>	<b>Distance from Transect Line (m)</b>
DME-1	B	15.2	5421094	447142	392	1.5
DME-2	C	30.5	5421099	447128	392	4.6
DME-3	D	45.7	5421093	447108	397	16.8
DME-4	E	61.0	5421106	447097	399	7.6
DME-5	E	61.0	5921099	447091	398	21.3
DME-6	F	76.2	5421109	447082	399	10.7
DME-7	G	91.4	5421108	447067	398	18.3
DME-8	H	106.7	5421130	447056	397	3.0
DME-9	I	121.9	5421131	447040	399	7.0
DME-10	J	137.2	5421133	447027	398	9.1

Notes:

(1) Total transect line distance from northeast corner to northwest corner was hand measured at approximately 139.5 meters

(2) Northeast Corner - N5421068, E447077, Elevation 401, Northwest Corner - N5421144, E447026, Elevation 398

(3) Coordinates based on Universal Transverse Mercator (UTM) using North American Datum of 1983 (NAD83), Zone 11

Grab sample points (container tag no.) located approximately perpendicular to and south of transect line



**ATTACHMENT B**  
**Field Data/Sampling Diaries**



FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study  
U.S. Location - Deadman's Eddy

Date: 5/27/2010  
Time: 12:17

Sample No. : TAI-US-DME-HS- 1

Container Tag : DME 1

ELEVATION (M) 392	UTM Northing (NAD83) 5421094	UTM Easting (NAD83) 447142
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PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Very dark gray</u> <u>10</u> YR <u>3</u> , <u>1</u> <u>moist</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Other Matrix Descriptions:	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Sample Depth: <u>4</u> to <u>8</u> inches Sample Depth: <u>10</u> to <u>20</u> cm	
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Cultural Resources: Archaeologist <u>Sarah McDaniel</u> Resources Found or Identified? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Please refer to archaeologist's observation record)		
Other Notes: <u>Cobbles and boulders @ 6 to 8 inches below surface</u>		
Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman		Photo Directory: <u>TAI-DME 5-27-2010</u>
Sampler Type: HS (hand sample)		Photo File No(s): <u>IMG_033 to 038</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 5, 27 /2010  
Time: 12:30



FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study  
U.S. Location - Deadman's Eddy

Date: 5/27/2010  
Time: 12:35

Sample No. : TAI-US-DME-HS- 2 Container Tag : DME 2

ELEVATION (M) <u>392</u>	UTM Northing (NAD83) <u>5421099</u>	UTM Easting (NAD83) <u>447128</u>
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PHYSICAL CHARACTERISTICS

<input type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input checked="" type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>moist</u> <u>Brown</u> <u>10</u> YR <u>4</u> <u>3</u> <u>Brownish yellow</u> <u>10</u> YR <u>6</u> <u>6</u>		<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Other Matrix Descriptions: <u>Mixed matrix colors</u>	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Sample Depth: <u>4</u> to <u>6</u> inches Sample Depth: <u>10</u> to <u>15</u> cm	
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Cultural Resources: Archaeologist <u>Sarah McDaniel</u> Resources Found or Identified? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Please refer to archaeologist's observation record)		
Other Notes: <u>Primarily fine sands, increasing uniformity w/ depth. Cobbles and boulders @ 5 to 6 inches below surface. Mixed color matrix for sands.</u>		
Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman		Photo Directory: <u>TAI-DME 5-27-10</u>
Sampler Type: HS (hand sample)		Photo File No(s): <u>IMG - 0039 to 0042</u>

Sampler Name: Jeff Leppo  
Sample Signature: [Signature]  
Date: 5/27/2010  
Time: 12:50



FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study

U.S. Location - Deadman's Eddy

Date:

5/27/2010

Time:

13:05

Sample No. : TAI-US-DME-HS- 3

Container Tag : DME 3

ELEVATION (M) <u>397</u>	UTM Northing (NAD83) <u>5421093</u>	UTM Easting (NAD83) <u>447108</u>
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PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures

Color (Munsell) Dark Gray 10 YR 4, 1  
 Moist/Dry Yellowish brown 10 YR 5, 6

**GC**  
Clayey gravels, gravel-sand-clay mixtures

Visible Organic Matter Yes  No  Description:

Other Matrix Descriptions:  
Mixed matrix colors

Odors Yes  No  Description:

Sample Depth: 4 to 12 inches  
 Sample Depth: 10 to 30 cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources: Archaeologist Sarah McDaniel Resources Found or Identified? Yes  No  (Please refer to archaeologist's observation record)

Other Notes:  
Layered sand horizons - dark gray & yellow brown  
Yellow brown  
dark gray

Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman	Photo Directory: <u>TAI-DME 5-27-10</u>
Sampler Type: HS (hand sample)	Photo File No(s): <u>IMG_0043 to 0048</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5, 27 2010

Time: 13:08



FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study

U.S. Location - Deadman's Eddy

Date: 5/27/2010

Time: 13:15

Sample No. : TAI-US-DME-HS- 4 Container Tag : DME 4

ELEVATION (M) 399	UTM Northing (NAD83) 5421106	UTM Easting (NAD83) 447097
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PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures

Color (Munsell) moist/dry Dark Gray 10 YR 3/1 Dark yellowish brown 10 YR 4/6	<input type="checkbox"/> GC Clayey gravels, gravel-sand-clay mixtures
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Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Other Matrix Descriptions: Mixed color matrix
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Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Sample Depth: 4 to 12 inches Sample Depth: 10 to 30 cm
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Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources: Archaeologist Sarah McDaniel Resources Found or Identified? Yes  No  (Please refer to archaeologist's observation record)

Other Notes:  
Layered sand horizons / striations of dark gray and dark yellowish brown sands  
vertical deposition

Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman Photo Directory: TAI-DME 5-27-2010

Sampler Type: HS (hand sample) Photo File No(s): IMG\_0049 to 0053

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5/27/2010

Time: 13:18



FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study  
U.S. Location - Deadman's Eddy

Date: 5/27/2010  
Time: 13:25

Sample No. : TAI-US-DME-HS- 5 Container Tag : DME 5

ELEVATION (M) <u>398</u>	UTM Northing (NAD83) <u>5421099</u>	UTM Easting (NAD83) <u>447091</u>
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PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures

Color (Munsell) Dark gray 10 YR 3 1  
Moist Dark yellowish brown 10 YR 4 6

**GC** Clayey gravels, gravel-sand-clay mixtures

Visible Organic Matter Yes  No  Description:

Other Matrix Descriptions:  
Mixed color matrix

Odors Yes  No  Description:

Sample Depth: 4 to 12 inches  
Sample Depth: 10 to 30 cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources: Archaeologist Sarah McDaniel Resources Found or Identified? Yes  No  (Please refer to archaeologist's observation record)

Other Notes:  
Layered sand horizons, dark gray and dark yellowish brown.

Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman

Photo Directory: TAI-DME 5-27-10

Sampler Type: HS (hand sample)

Photo File No(s): IMG\_0054 to 0059

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5, 27 /2010

Time: 13:30



FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study

U.S. Location - Deadman's Eddy

Date: 5/27/2010  
Time: 13:35

Sample No. : TAI-US-DME-HS- 6

Container Tag : DME 6

ELEVATION (M) <u>399</u>	UTM Northing (NAD83) <u>5421109</u>	UTM Easting (NAD83) <u>447082</u>
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PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity.	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures

Color (Munsell) Dark gray 10 YR 3/1  
Dark yellowish brown 10 YR 4/6

**GC** Clayey gravels, gravel-sand-clay mixtures

Visible Organic Matter Yes  No  Description:


Other Matrix Descriptions:  
Mixed color matrix

Odors Yes  No  Description:

Sample Depth: \_\_\_\_\_ to \_\_\_\_\_ inches  
Sample Depth: \_\_\_\_\_ to \_\_\_\_\_ cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources: Archaeologist Sarah McDaniel Resources Found or Identified? Yes  No  (Please refer to archaeologist's observation record)

Other Notes:  
Mixed sand layers / horizons of dark gray and dark yellowish brown, vertical deposition  
Evidence of beach washing 

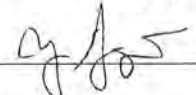
Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman

Photo Directory: TAI-DME 5-27-2010

Sampler Type: HS (hand sample)

Photo File No(s): IMG\_0060 to 0065

Sampler Name: Jeff Leppo

Sample Signature: 

Date: 5/27/2010

Time: 13:40



FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study  
U.S. Location - Deadman's Eddy

Date: 5/27/2010  
Time: 13:50

Sample No. : TAI-US-DME-HS- 7

Container Tag : DME 7

ELEVATION (M) 398	UTM Northing (NAD83) 5421108	UTM Easting (NAD83) 447067
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PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures

Color (Munsell) Dark Gray 10 YR 3 1  
Brownish yellow 10 YR 6 6

GC Clayey gravels, gravel-sand-clay mixtures

Visible Organic Matter Yes  No  Description:

Other Matrix Descriptions:  
Mixed color matrix

Odors Yes  No  Description:

Sample Depth: 4 to 12 inches  
Sample Depth: 10 to 30 cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources: Archaeologist Sarah McDaniel Resources Found or Identified? Yes  No  (Please refer to archaeologist's observation record)

Other Notes:  
Mixed color matrix, relatively even distribution, no layering/striations

Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman

Photo Directory: TAI-DME 5-27-2010

Sampler Type: HS (hand sample)

Photo File No(s): IMG0066 to 0071

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5/27 /2010

Time: 13:52





FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study

U.S. Location - Deadman's Eddy

Date:

5, 27 2010

Time:

14:00

Sample No. : TAI-US-DME-HS- 8

Container Tag : DME 8

ELEVATION (M) <u>397</u>	UTM Northing (NAD83) <u>5421130</u>	UTM Easting (NAD83) <u>447056</u>
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PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Dark gray</u> <u>10</u> YR <u>3</u> <u>1</u> <u>1</u> <u>Dark yellowish brown</u> <u>10</u> YR <u>4</u> <u>1</u> <u>6</u>		<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		Other Matrix Descriptions: <u>Mixed color matrix</u>
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:		Sample Depth: <u>4</u> to <u>6</u> inches Sample Depth: <u>10</u> to <u>15</u> cm
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> <u>See notes below</u>		
Cultural Resources: Archaeologist <u>Sarah McDaniel</u>		Resources Found or Identified? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Please refer to archaeologist's observation record)
Other Notes: <u>Mixed layered sand horizons of dark gray and dark yellowish brown over gravels and cobbles - coarse materials w/ yellowish brown (10YR 5/8) fine sand (SP). Roots present (near shrubs), some limited organic litter (wood particles)</u>		
Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman		Photo Directory: <u>TAI-DME 5-27-2010</u>
Sampler Type: HS (hand sample)		Photo File No(s): <u>IMG_0072 to 0079</u>

Sampler Name: Jeff Leggo

Sample Signature: [Signature]

Date: 5, 27 /2010

Time: 14:05



FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study  
U.S. Location - Deadman's Eddy

Date: 5/27/2010  
Time: 14:15

Sample No. : TAI-US-DME-HS- 9 Container Tag : DME 9

ELEVATION (M) <u>399</u>	UTM Northing (NAD83) <u>5421131</u>	UTM Easting (NAD83) <u>447040</u>
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PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> <b>SW</b> Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SM</b> Silty sands, sand-silt mixtures	<input type="checkbox"/> <b>GW</b> Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>SP</b> Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> <b>SC</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GP</b> Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> <b>ML</b> Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> <b>CL</b> Clayey sands, sand-clay mixtures	<input type="checkbox"/> <b>GM</b> Silty gravels, gravel-sand-silt mixtures
Color (Munsell) <u>Dark gray</u> <u>10</u> YR <u>3</u> 1/1 <u>Brownish yellow</u> <u>10</u> YR <u>6</u> 1/6		<input type="checkbox"/> <b>GC</b> Clayey gravels, gravel-sand-clay mixtures
Visible Organic Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Other Matrix Descriptions: <u>mixed color matrix</u>	
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Description:	Sample Depth: <u>4</u> to <u>12</u> inches Sample Depth: <u>10</u> to <u>30</u> cm	
Obvious Abnormalities (wood, shells, organisms, etc): Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Cultural Resources: Archaeologist <u>Sarah McDaniel</u> Resources Found or Identified? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Please refer to archaeologist's observation record)		
Other Notes: <u>Evenly mixed sands, no visible layers/striations.</u> <u>Few gravels w/ depth. Coarser sands appear to be brownish yellow</u>		
Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman		Photo Directory: <u>TAI-DME 5-27-2010</u>
Sampler Type: HS (hand sample)		Photo File No(s): <u>IMG-0080 to 0084</u>

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5, 27 /2010

Time: 14:17



FIELD SAMPLE LOG - SEDIMENTS

Upper Columbia River - Methods Development White Sturgeon Sediment Toxicity Study  
U.S. Location - Deadman's Eddy

Date:

5/27/2010

Time:

14:21

Sample No. : TAI-US-DME-HS-

10

Container Tag : DME

10

ELEVATION (M) 398	UTM Northing (NAD83) 5421133	UTM Easting (NAD83) 447027
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PHYSICAL CHARACTERISTICS

<input checked="" type="checkbox"/> SW Well graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SM Silty sands, sand-silt mixtures	<input type="checkbox"/> GW Well graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> SP Poorly graded sand, gravelly sand, little to no fines.	<input type="checkbox"/> SC Clayey sands, sand-clay mixtures	<input type="checkbox"/> GP Poorly graded gravels, gravel-sand mixtures, little to no fines
<input type="checkbox"/> ML Inorganic silts, very fine sands, rock flour, silt or clay silts with low plasticity	<input type="checkbox"/> CL Clayey sands, sand-clay mixtures	<input type="checkbox"/> GM Silty gravels, gravel-sand-silt mixtures

Color (Munsell) Dark gray 10 YR 3 1/1  
Yellowish brown 10 YR 5 1/6

GC Clayey gravels, gravel-sand-clay mixtures

Visible Organic Matter Yes  No  Description:

Other Matrix Descriptions:

Odors Yes  No  Description:

Sample Depth: 4 to 12 inches  
Sample Depth: 10 to 30 cm

Obvious Abnormalities (wood, shells, organisms, etc): Yes  No

Cultural Resources: Archaeologist Sarah McDaniel Resources Found or Identified? Yes  No  (Please refer to archaeologist's observation record)

Other Notes:  
Mixed matrix, evenly distributed colors + grain size

Boat Contractor: Columbia Navigation, Inc, Capt. Eric Weatherman

Photo Directory: TAI-DME 5-27-2010

Sampler Type: HS (hand sample)

Photo File No(s): IMG\_0085 to 0089

Sampler Name: Jeff Leppo

Sample Signature: [Signature]

Date: 5, 27 /2010

Time: 14:25

**ATTACHMENT C**  
**Environmental Field Book**

Location URS Office Spokane Date 5/26/10 <sup>13</sup>

Project / Client UCR Methods Sediment Study

Deadman's Eddy (1 of 1)

Field Prep + Mobilization - Surface Sediments

General QAPP References

\* Sample Coordinates:

Deadman's Eddy Gravel Bar

	Northing	Easting
NE Corner	5421097	447158
NW Corner	5421144	447026
SW Corner	5421127	447023
SE Corner	5421068	447077

Polygon - 20 meters (66 ft)  
Radius

- establish grid from 4 Corners

\* Collect Benchmark UTM + Elev

⊕ Northport Boat Launch

\* Grain Size Sands (0.5 to 2mm)

\* Steel Shovel, see QAPP Decon

\* Remove Top 4 in (~~10.16~~ cm)

Collect 4 to 12 in (10-31 cm)

No samples below (12 in) or (31 cm)

14

TAI

Location Teck American Inc Date 5/27/10  
 Project / Client UCR Deadman's Eddy ①  
White Sturgeon - Methods - Sediment

084 Arrive ① site  
 D

### Attendees

Sarah McDaniel, URS  
 Steve Demus, CH2M Hill  
 Joe Wickman  
 Alan Burkhardt, Columbia Nav.  
 Eric Westerman, Columbia Nav.

Establish BM for UTM (Elev.  
 Zone 11, NAD83

Elev. 402 meters 411 M  
 5419055 N, 443452 E

Photos Take 1st 2 Photos.

TAI-DME 5-27-2010 IMG\_0001 to 0002

Safety Meeting

Boat Setup

Slaps Trip & Falls

PF Devices

GPS Unit - Magellan Triton (hand-held)

15

Location UCR Deadman's Date 5/27/10 ②  
 Project / Client Eddy TAI  
White Sturgeon Methods - Sediment

0910 - Leave dock for DME  
 0940 - Arrive ① DME Sandbar. Land on  
 on cut/curre north of sampling  
 area Beachcraft on sand @ water's  
 edge. 397

Appr. Water Elev. GPS 407m

0955 Stake out NE Corner  
 ① N 5421097, 4471058 E

1010 Stake out SE Corner  
 ① 5421068, 447077 E  
 395 m elev.

1020 Stake ① SW Corner  
 N 5421127, 447023, 395m

1030 Stake ① NW Corner m  
 5421144, 447026, 398 Elev

Photos DME 5-27-2010 IMG\_0003 - IMG\_0020

16

Location OCR Date 5/27/10Project / Client Deadman's Eddy TAI  
White Sturgeon methods - Sediment (3)General Photos - Views  
From Approx midlake cress— Sarah McB @ center of sampling area  
(where photos shot from)

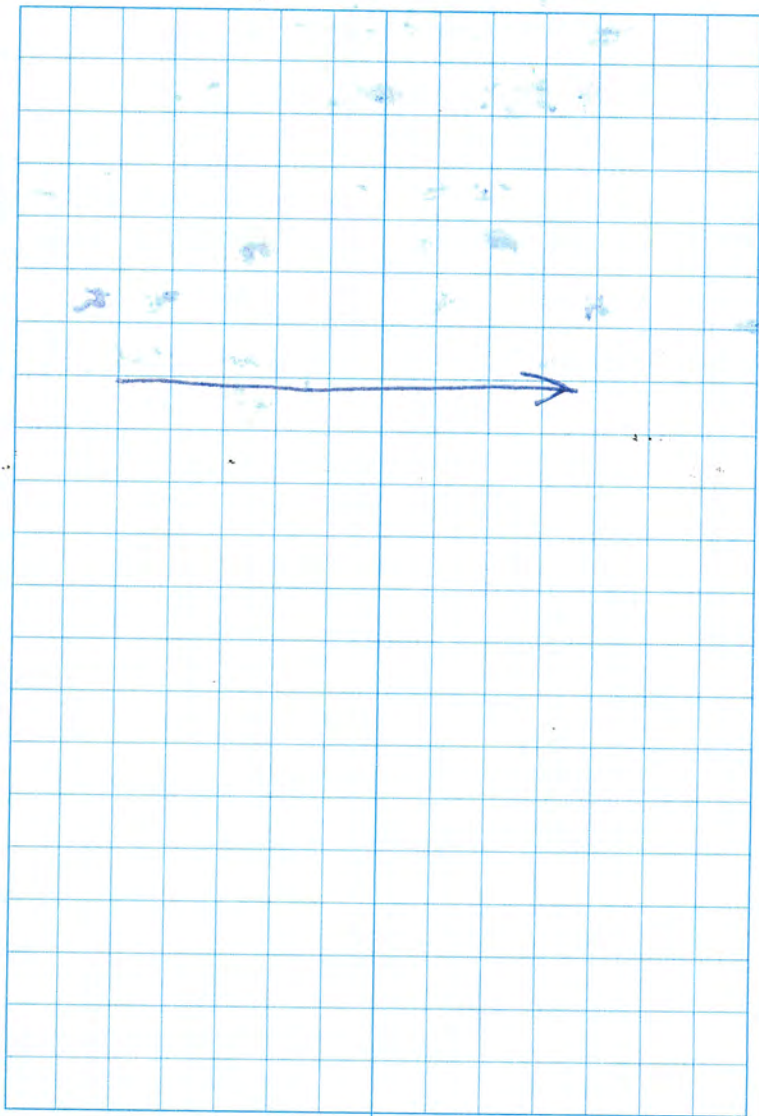
- 1 Picture to NE  $\Delta$  from center
- 2 Photo to SE  $\Delta$  from center
- 3 Photo to SW + NW

Photos

TAI - DME 5-27-2010 IMG\_0003 to IMG\_0020

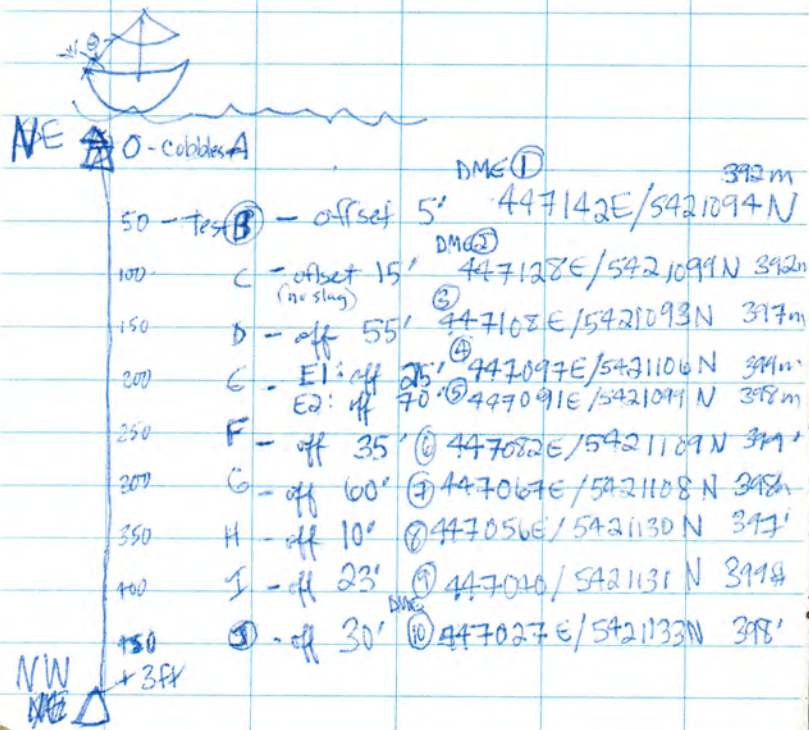
GPS Unit - Magellan, hand held.

- Variable elevation readings observed, not consistent with topography

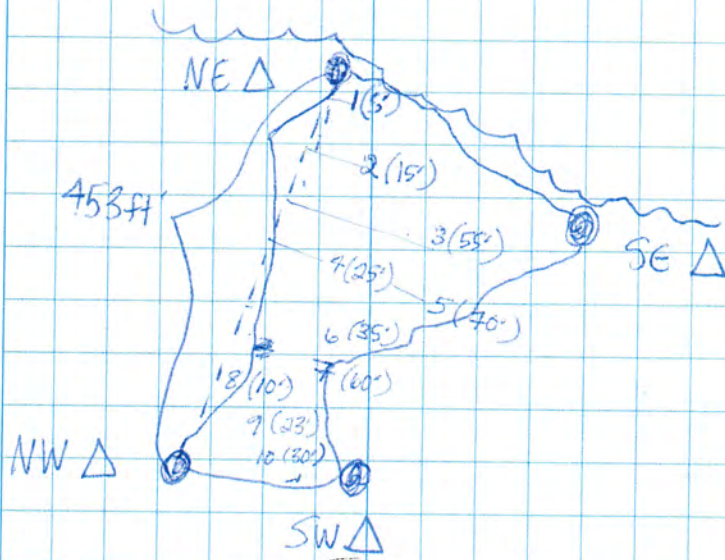
Location OCR Date 5/27/10 <sup>17</sup>Project / Client Deadman's Eddy TAI  
White Sturgeon methods - sediments 4

Location UCR Deadman's Eddy Date 5/27/10Project / Client TAFWhite Sturgeon Methods - Sediment (5)

String line set up between  
NE  $\Delta$  and NW  $\Delta$   
as reference line - logical place  
between sand bar & rock bar  
to set line, then systematic interval  
of 50 ft intervals measured out  
Total length of line: 453-ft.

Location UCR Deadman's Eddy Date 5/27/10Project / Client TAFWhite Sturgeon Methods - Sediment (6)

Complete Transect layout & station  
markings. <sup>Photos</sup> TAI-DME5-27-2010 IMG\_0021-0024  
115 Decon buckets w/ alcohol,  
DI, Alcohol <sup>Photos</sup> TAF-DME5-27-2010 IMG\_0025  
120 Search to start layout of 10 <sup>to</sup> 0027  
grab sample points based on  
station points



Other Photos

Site TAI-DME5-27-2010 IMG\_0028-0032

Samples TAI-DME5-27-2010 IMG\_0033-0091

- see field logs for specific photos



20

Location VCR Deadman's Eddy Date 5/27/10Project / Client TAIWhite Sturgeon Methods - Sediments (7)

Weather conditions - change  
throughout session from 55°F  
and cloudy to increasing rain.  
Steady rain continues thru to  
end of sample

1435 - leave site, head for  
Northport Boat Launch.  
Unload buckets & gear  
into truck.

1515 - Leave for Spokane

Note: Field sheets/logs prepared  
for each 10 grab samples,  
included descriptions, sample  
numbers, UTM coordinates  
etc.

21

Location VCR Deadman's Eddy Date 5/27/10Project / Client TAIWhite Sturgeon Methods - Sediments (8)

1815 - Return to Spokane, complete  
sample QA/QC and CoFC for  
delivery to TAI

<u>Container No.</u>	<u>Sample Time</u>
DME-1	1217
DME-2	1235
DME-3	1305
DME-4	1315
DME-5	1325
DME-6	1335
DME-7	1350
DME-8	1400
DME-9	1415
DME-10	1421

\* CoFC No. DME-COC-001  
1850 Finish demob for day

*Jeff*  
Jeffrey E. Leppo

**ATTACHMENT D**  
**Photographic Record**  
**Provided on Compact Disc (CD)**

**ATTACHMENT E**  
**Archaeological Monitoring Results**



# MEMORANDUM

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**TO:** Marko Adzic, Teck American Incorporated  
**FROM:** Sarah McDaniel, RPA  
**DATE:** June 23, 2010  
**FILE:** 36310054.00002  
**SUBJECT:** Archaeological Monitoring Results,  
On-Shore Sediment Sampling - Deadman's Eddy, Upper Columbia River, Stevens  
County, Washington  
Methods Development for the White Sturgeon Sediment Toxicity Study

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## Introduction

URS Corporation (URS) conducted field services for Teck American Incorporated (Teck) along the Upper Columbia River (UCR) at Deadman's Eddy (DME). Specifically, on-shore sediment samples were collected from the gravel bar at Deadman's Eddy located in Stevens County, Washington, on May 27, 2010. The field services scope of work was based on the requirements and standard operating procedures (SOPs) outlined within the *Quality Assurance Project Plan – Methods Development for the White Sturgeon Sediment Toxicity Study* (QAPP) prepared for Teck in April 2010 and as approved by the U.S. Environmental Protection Agency (EPA). This cultural resource monitoring report has been prepared in support of the above-mentioned work and is consistent with the protocols outlined in Appendix C Cultural Resources Coordination Plan of the aforementioned approved QAPP.

As per the QAPP, archaeological monitoring of ground-disturbing activities was conducted by a qualified archaeologist meeting the Secretary of Interior's Professional Qualification Standards (as outlined in 36 CFR Part 61). This memorandum documents results of the monitoring that occurred on May 27, 2010, by URS archaeologist Sarah McDaniel, Registered Professional Archeologist (RPA) in conjunction with the on-shore sediment sampling. No cultural resources were identified or disturbed as a result of this investigation.

## Location

The DME project site is located along the Columbia River (River Mile 738.5), about two miles northeast of the town of Northport, Washington, in Stevens County. The sampling area is found in Section 26, Township 39 ½ North, Range 40 East, on the USGS 7.5' Series Boundary, Washington quadrangle (Figure 1). The DME location is identified within the QAPP (April 2010) and delineated within four coordinates under the Universal Transverse Mercator (UTM) system using North American Datum for 1983 (NAD83, Zone 11). The four UTM corner coordinates are identified as:

- Northeast Corner –Easting (447158), Northing (5421097)
- Southeast Corner –Easting (447077), Northing (5421068)
- Southwest Corner –Easting (447023), Northing (5421127)
- Northwest Corner –Easting (447026), Northing (5421144)





## MEMORANDUM

Marko Adzic, Teck American Incorporated

June 23, 2010

Page 3 of 7

### Background Research

Prior to the fieldwork, a records search was conducted by URS to identify any previously recorded archaeological sites, historic resources, or cultural surveys within one mile radius of the project Area. The May 2010 search was conducted via the online Washington State Department of Archaeology and Historic Preservation (DAHP) Washington Information System for Architectural and Archaeological Records Data (WISAARD) database. This restricted-access, searchable GIS database depicts locations of the following: 1) previously-recorded archaeological sites, 2) cultural resource surveys conducted after 1995, 3) historic register properties, and 4) cemeteries. Regional ethnographic, historic, and archaeological references were also consulted as part of this pre-field review.

General sensitivity of the sampling area is high based on the quantity of archaeological sites that can be found along this stretch of the UCR. Results of the records search indicate that there are two archaeological sites (45ST89 and 45ST90) located over 0.25 mile to the east and to the west, respectively, of the DME sampling area; but none are known to be present within the sampling area. Previously-recorded site types include pre-contact period resources, such as shell, bone, caches, sweatlodges, hearths, and stone tool materials, as well as historic period resources related to mining and homesteading. These sites appear to be found at slightly higher elevations than the project site, which is seasonally inundated by the Columbia River, but are often found eroding into the Columbia River.

Ethnographic literature (e.g., Bouchard and Kennedy 1979, 1984; Kennedy and Bouchard 1998; Pearkes 2002) does not indicate specific place-names for the project site, but describes a number of ethnogeographic locales in this general area. For example, a small Lakes village was reportedly located about three miles upriver from Northport, which would put it in the vicinity of the project site. The project site may also be at or near the locale of an “aboriginal campsite,” described as being located “northeast from the gravel bar immediately upriver from Nigger Creek and across the river from Deadmans Eddy”, which was occupied until around 1910 (Bouchard and Kennedy 1979:320; Chance 1967:77). Clair Hunt’s Homesteaders Map of the North Half of the Colville Indian Reservation (<http://content.wsulibs.wsu.edu/u/?maps,720>), dated 1900, depicts the locations of several Indian allotments along the west side of the Columbia River in the area of Nigger Creek and the project site. In sum, ethnographic and historic references indicate the project site, which falls within ceded North Half of the Colville Indian Reservation, has been used by ancestral to contemporary Lakes and Colville peoples and could contain evidence of this prior use, especially as related to fishing or habitation activities. Historic use of the area could also be found as related to mining and homesteading activities.

### Field Methods

One the day of the site visit, project observers, including boat operators and environmental representatives, were advised of the potential for archaeological resources and to avoid contact with any such resources should they be encountered. As some of the individuals are local residents and familiar with the history of this area, URS asked if any were aware of the presence of potential cultural resources or the origin of the name “Deadman’s Eddy.” Eric Weatherman, of Columbia Navigation Inc., believed the name has something to do with an historic train derailment, but was uncertain as to the accuracy of this information (personal communication, May 27, 2010). Technical Advisor for Citizens for a Clean Columbia Joe Wichmann, Ph.D., stated that the gravel bar on which the project sampling occurred had



# MEMORANDUM

Marko Adzic, Teck American Incorporated  
June 23, 2010  
Page 4 of 7

been altered by historic mining activities (personal communication, May 27, 2010). None of the individuals questioned knew of any specific cultural resource concerns within the project site.

The DME location is on the west side of the Columbia River and is a depositional sediment bar composed primarily of sands, gravels, cobbles and boulders. Within this area, 10 grab sample points were collected at 50-foot intervals. At each sample point, a 5-gallon bucket was filled by a URS geologist using a shovel, within an area previously-approved for sampling in the QAPP. Coordinates of the samples were plotted under the UTM system using North American Datum for 1983 (NAD83) (Table 1), as shown in Map 1, Sediment Sample Locations.

Individual grab sample points were visually inspected for any evidence of cultural resources prior to any sampling. Sediment removed for sampling was also visually inspected by the archaeologist during ground disturbance. As outlined within the approved QAPP, the hand excavation removed the upper 4 inches (10 centimeters) of sediment to access the underlying sample area, and grab samples were generally collected between 4 and 12 inches (30 centimeters) below the ground surface. The presence of buried cobbles and boulders was observed at several locations, with the sand sediments collected above these materials. Depth of the shovel sampling did not exceed 12 inches.

**Table 1.** Grab Sample Locations Coordinates.

Northing (UTM-NAD83)	Easting (UTM-NAD83)	Elevation (m)
5421094	447142	392
5421099	447128	392
5421093	447108	397
5421106	447097	399
5921099	447091	398
5421109	447082	399
5421108	447067	398
5421130	447056	397
5421131	447040	399
5421133	447027	398

## Field Observations

The project site is used as a local “party spot” by adolescents, with campfire rings, rubber tires and other modern debris observed across the gravel bar. Two metal artifacts, including a tin cup and unidentifiable metal fragment, were observed near the project site but were not impacted by the sediment removal. The gravel bar that comprises the project site is largely characterized by rounded river cobbles that appear to have been re-deposited as a result of natural riverine forces, and possibly the reported historic mining activities.

The project site is subject to frequent inundation, as evidenced by the overall absence of vegetation and soil development (Photo 1). Sediment consists of black and tan sand deposits (Photo 2) along with river cobbles. No significant cultural resources were observed during the pre-investigation surface examination, and none were encountered during the limited subsurface sediment sampling activities. Additional sediment sampling at this same QAPP locale, using the same techniques of shovel excavation and extending to the same limited depths of about 12 inches, is unlikely to affect any significant, buried resources given the frequent inundation of this landform and the absence of surficial artifacts.



**Photo 1.** Overview of the Deadman's Eddy sample area, facing south. Lathe at bottom left of photo demarks the northeast corner of the DME sediment sampling area.





**Photo 2.** Deadman's Eddy sediment sampling methods, facing east.



## MEMORANDUM

Marko Adzic, Teck American Incorporated

June 23, 2010

Page 7 of 7

### References

Bouchard, Randy and Dorothy I.D. Kennedy

1979 Ethnogeography of the Franklin D. Roosevelt Lake Area. British Columbia Indian Language Project. Prepared for the Bureau of Reclamation, U.S. Department of the Interior.

1984 Indian Land Use and Occupancy in the Franklin D. Roosevelt Lake Area of Washington State. British Columbia Language Project. Prepared for the Colville Confederated Tribes and the United States Bureau of Reclamation.

Chance, David H.

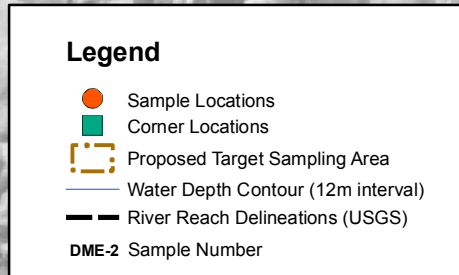
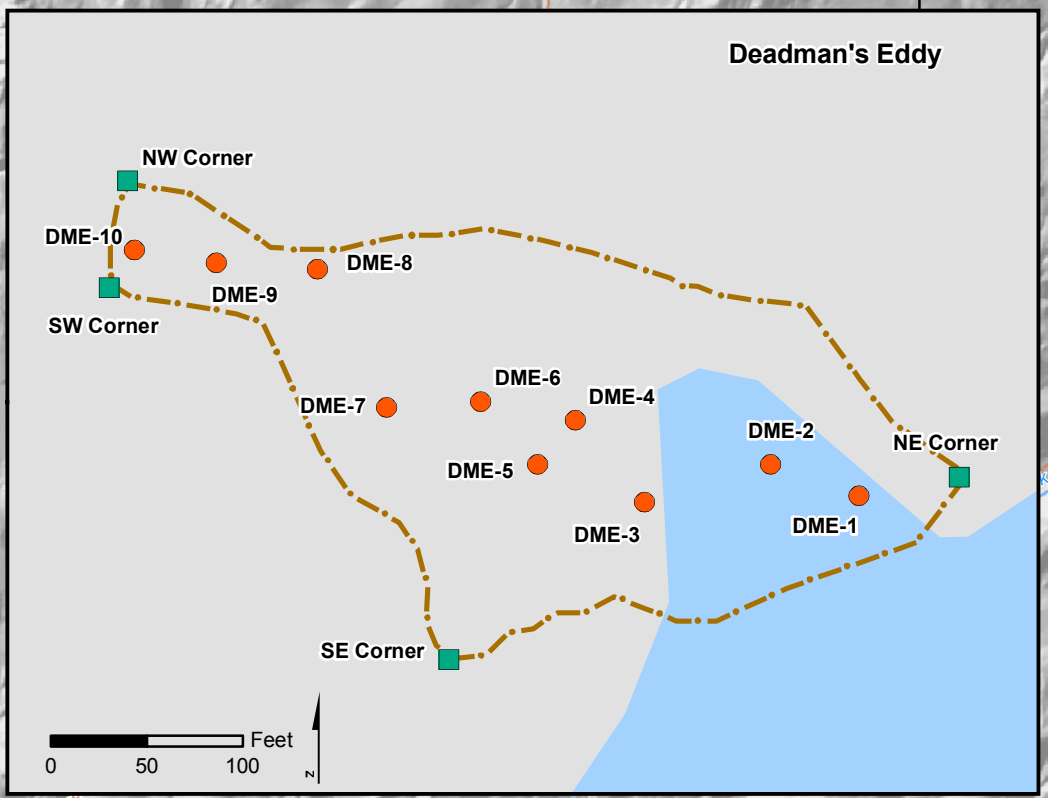
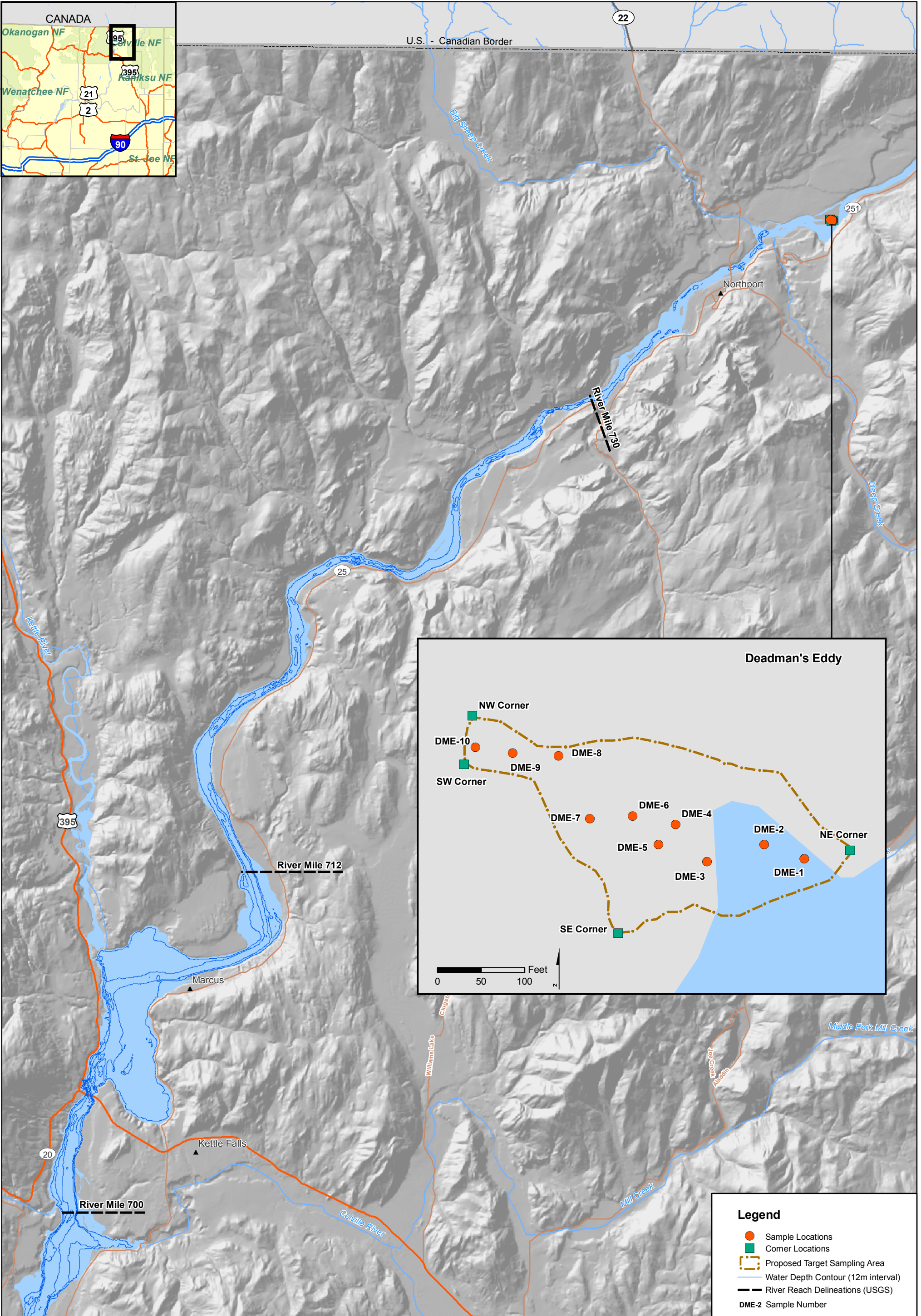
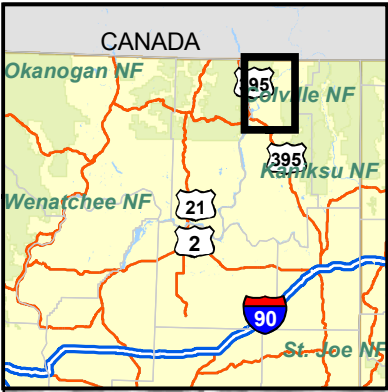
1967 *Archaeological Survey of Coulee Dam National Recreation Area, Part 2: Spring Draw Down of 1967*. Report of Investigations No. 42. Laboratory of Anthropology, Washington State University, Pullman.

Kennedy, Dorothy I.D., and Randall T. Bouchard

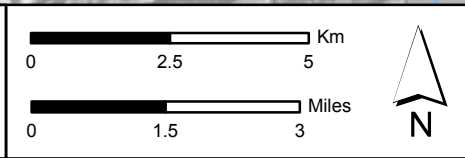
1998 Northern Okanagan, Lakes, and Colville. In *Handbook of North American Indians*, Vol. 12, Plateau, pp. 238-252. William C. Sturtevant, series editor. Smithsonian Institution, Washington, D.C.

Parkes, Eileen Delehanty

2002 *The Geography of Memory: Recovering Stories of a Landscape's First People*. Kutenai House Press, Wilaw, British Columbia, Canada.



**Sediment Sample Locations**



**URS Corporation**  
 Source:  
 GIS base layer Information  
 provided by Parametrix Inc.

**Map 1 Methods Development for the  
 White Sturgeon Sediment Toxicity Study  
 (Deadman's Eddy)  
 Upper Columbia River, WA**

**ATTACHMENT F**  
**Chain-of-Custody**

Revenue Canada  
Customs and Excise

# CANADA CUSTOMS INVOICE

Page 1 of 1

1. Vendor (Name and Address) TECK AMERICAN INC. 501 N RIVERPOINT BLVD SUITE 300 SPOKANE, WA 99202		2. Date of Direct Shipment to Canada MAY 27, 2010	
4. Consignee (Name and Address) TECK METALS LTD. 25 ALDRIDGE AVE. TRAIL, B.C. V1R 4L8		3. Other References (Include Purchaser's Order No.) SAMPLES FOR TESTING PURPOSES	
8. Transportation: Give Mode and Place of Direct Shipment Canada PRIVATE VEHICLE EX SPOKANE, WA TECK REPRESENTATIVE: MARKO ADZIC		5. Purchaser's Name and Address (if other than Consignee)	
		6. Country of Transshipment	
		7. Country of Origin of Goods USA	IF SHIPMENT INCLUDES GOODS OF DIFFERENT ORIGINS ENTER ORIGINS AGAINST ITEMS IN 12
		9. Conditions of Sale and Terms of Payment (i.e. Sale, Consignment Shipment, Leased Goods, etc.) NOT SOLD. SAMPLES FOR TESTING PURPOSES	
		10. Currency of Settlement US DOLLARS	
11. No. of Pkgs 10	12. Specification of Commodities (Kind of Packages, Marks and Numbers, General Description and Characters (i.e. Grade, Quality)) 5 GALLON BUCKETS CONTAINING GRANULATED SLAG/SILICA SEDIMENT SAMPLES   79YT PARS 007471 / TECKCOMINCO METALS  <b>H.S. 2621.90.00.00</b>	13. Quantity (State Unit) 120 KGS.	14. Unit Price \$10.00
		15. Total NO COMMERCIAL VALUE. NOT SOLD. VALUE FOR CUSTOMS PURPOSES ONLY.	
18. If any of fields 1 to 17 are included on the attached commercial invoice, check this box Commercial Invoice No. _____ [ ]		16. Total Weight Net _____ Gross 120 KGS.	17. Invoice Total \$10.00
19. Exporter's Name and Address (if other than Vendor)		20. Originator (Name and Address) TECK METALS LTD. TRAIL, B.C. V1R 4L8	
21. Departmental Ruling (if applicable)		22. If fields 23 to 25 are not applicable, check this box [ x ]	
23. If included in field 17 indicate amount: (i) Transportation charges, expenses and insurance from the place of direct shipment to Canada  (ii) Costs for construction, erection and assembly incurred after importation into Canada  (iii) Export packing	24. If not included in field 17 indicate amount: (i) Transportation charges, expenses and insurance to the place of direct shipment to Canada  (ii) Amounts for commissions other than buying commissions  (iii) Export packing	25. Check (if applicable):  (i) Royalty payments or subsequent proceeds are paid or payable by the purchaser [ ]  (ii) The purchaser has supplied goods or services for use in the production of these goods [ ]	

**WAREHOUSE SHIPPING INSTRUCTIONS FOR OUTBOUND SHIPMENTS**

(THIS FORM MUST ACCOMPANY ALL OUTGOING SHIPMENTS WHEN THE SHIPMENT IS SENT TO THE WAREHOUSE)

**SHIP TO:**

Company Name: Wolf Saskatchewan Toxicology Centre Date: June 1, 2010

Street: 44 CAMPUS DRIVE

City: SASKATOON Province: SASK.

Postal Code: S7N 5B3 Phone No. (306) 966-5733

*Mr Markus Hecke*

CONTACT TRAFFIC DEPT. FOR DOCUMENTATION FOR EXPORT SHIPMENTS.

**Description of Goods Being Shipped:** (Show total weight or volume or dangerous goods in each package)

10 Barrels of sediments on Pallet  
CHAIN OF CUSTODY Required!!

**Reason Material Being Shipped:**

(Note: Purchasing must be advised of any goods being sent to a supplier. Contact Purchasing if you have any questions.)

Credit Return  Exchange  Repair & Return  Sample  Testing  Warranty

Reason: River Sediment For Testing

P.O. Number \_\_\_\_\_ Supplier Return Authorization No. (or Invoice No.) \_\_\_\_\_

Buyer Contacted \_\_\_\_\_ Supplier Contact (Who Authorized Return): \_\_\_\_\_

**Shipping Instructions:**

Air  Courier  Mail  Truck  Prepaid  Collect

Approximate Value of Shipment Not Commercial Charge Code for Prepaid Shipments 1154

IMPORTANT: DANGEROUS GOOD DECLARATION			
Is this material classified under the T.D.G.R. YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	Proper Shipping Name:		
Certain materials are classified as Dangerous goods under the Transportation of Dangerous goods Regulations (T.D.G.R.) and require special packaging, labeling and documentation. Complete the information requested here if the regulations apply to this material.	Major Component - If * N. O. S. **		
	Identification No. (UN, NA of PIN)		
If in doubt, contact Warehouse Shipper, Phone 4975	Primary Class	Sub. Class	Packing Group

Enx Not Commercial Regulation Bill Duncanson  
 PLANT ORIGINATOR (PRINT) ACTIVITY (PRINT)  
[Signature] 4736  
 SIGNATURE OF PLANT ORIGINATOR PHONE NO.

**ALL OF ABOVE PORTION OF FORM MUST BE COMPLETED BY ORIGINATOR**

Warehouse Remarks (To be completed by Warehouse Personnel)		
Date Shipped:	Carrier:	Way Bill No.
No. of Cartons:	Total Weight: <u>720kg</u>	Warehouse Shipper:

**WHITE** - TRAFFIC COPY    **GREEN** - SUPPLIER COPY (INCLUDE WITH OUTBOUND SHIPMENT)    **CANARY** - WAREHOUSE COPY  
**PINK** - THIS COPY TO BE RETURNED TO INITIATOR BY WAREHOUSE ONCE SHIPMENT SENT    **GOLD** - ACCOUNTS PAYABLE (IF REQUIRED)



Client: <b>Teck American Incorporated</b> 501 North Riverpoint Blvd, Ste 300 Spokane, WA 99202 Project Manager Kris McCaig, kris.mccaig@teck.com	<b>CHAIN of CUSTODY</b>		Page <u>1</u> of <u>1</u>
	Project:		Lab Turn-around Time:
	Upper Columbia River White Sturgeon Sediment Toxicity Study		Please refer to project QAPP (April 2010)
	Telephone No 509-459-4451	Fax No 509-459-4400	<b>DEADMAN'S EDDY - U.S.</b>
P.O. #			

Sample I.D.	Container Tag No	No. of Containers	Matrix	Sampling Date	Sampling Time	Analytical / Physical Parameters		Sample Notes and Comments	Lab ID No.
						Upper Columbia River - Quality Assurance Project Plan Methods Development for the White Sturgeon Sediment Toxicity Study, April 2010			
TAI-US-DME-1-HS -1	DME1	1	Sed	5/27/10	1217	✓			
TAI-US-DME-1-HS -2	DME2	1	Sed	5/27/10	1235	✓			
TAI-US-DME-1-HS -3	DME3	1	Sed	5/27/10	1305	✓			
TAI-US-DME-1-HS -4	DME4	1	Sed	5/27/10	1315	✓			
TAI-US-DME-1-HS -5	DME5	1	Sed	5/27/10	1325	✓			
TAI-US-DME-1-HS -6	DME6	1	Sed	5/27/10	1335	✓			
TAI-US-DME-1-HS -7	DME7	1	Sed	5/27/10	1350	✓			
TAI-US-DME-1-HS -8	DME8	1	Sed	5/27/10	1400	✓			
TAI-US-DME-1-HS -9	DME9	1	Sed	5/27/10	1415	✓			
TAI-US-DME-1-HS -10	DME10	1	Sed	5/27/10	1421	✓			

Custodial Record			Sample Receiving Notes		Unique Chain of Custody No.
Relinquished by: <i>Jeffrey E. Loppo</i> Jeffrey E. Loppo	Date 5/28/10	Time 0900			DME-COC-001
Received by: <i>Alexandra Vermeulen</i> Alexandra Vermeulen	Date 5/28/10	Time 0900			Laboratory Work Order No.
Relinquished by: <i>Alexandra Vermeulen</i> Alexandra Vermeulen	Date 6/01/10	Time 10:45 am			
Received by: <i>Kris Paaz</i> Kris Paaz	Date 06/01/10	Time 10:45			
Relinquished by:	Date	Time			
Received by Laboratory	Date	Time			

## **APPENDIX D**

---

### PHOTOGRAPHS OF SEDIMENT EXPOSURE STUDY USING WHITE STURGEON







Photo D-1. White sturgeon sediment toxicity test exposure chambers as set-up at the University of Saskatchewan, Aquatic Toxicity Research Facility. Each green tub represents an exposure chamber.



Photo D-2. White sturgeon sediment toxicity test exposure chambers as set-up at the University of Saskatchewan, Aquatic Toxicity Research Facility. Each green tub represents an exposure chamber.



Photo D-3. White sturgeon sediment toxicity test exposure chambers as set-up at the University of Saskatchewan, Aquatic Toxicity Research Facility. Each green tub represents an exposure chamber.



Photo D-4. White sturgeon sediment toxicity test exposure chambers as set-up at the University of Saskatchewan, Aquatic Toxicity Research Facility. Each green tub represents an exposure chamber.

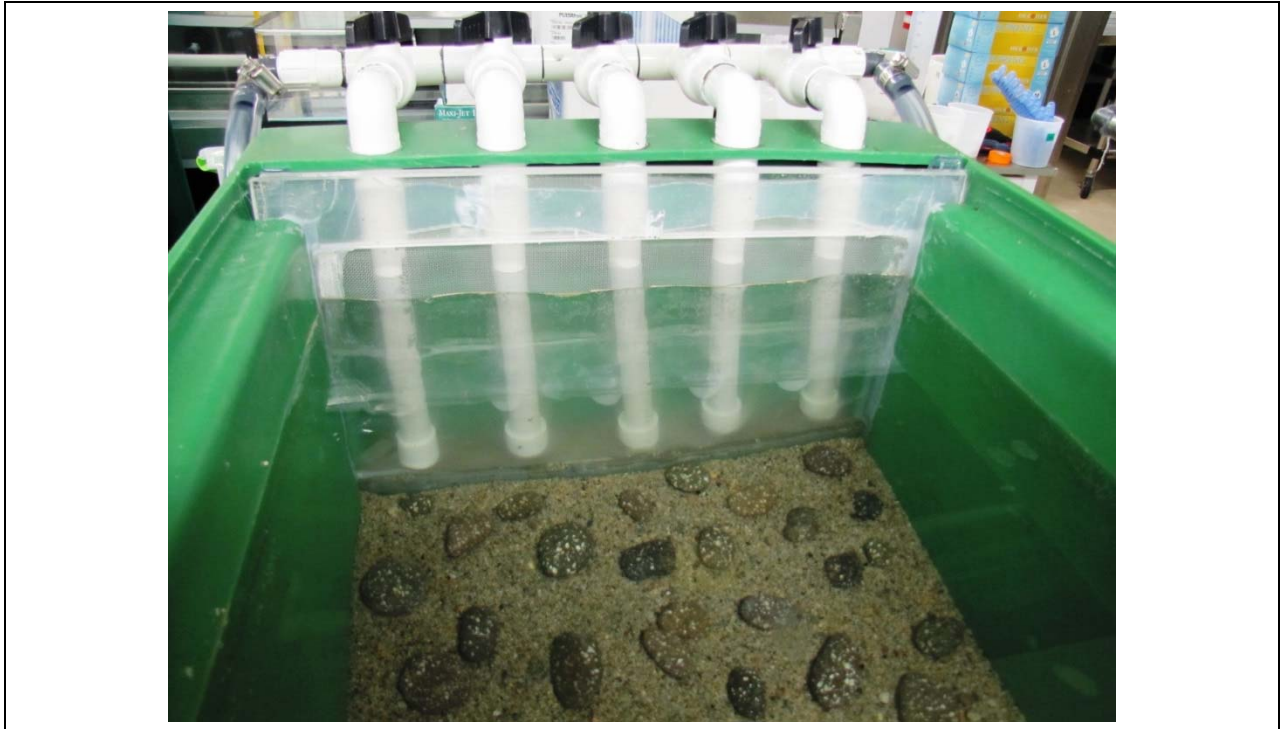


Photo D-5. White sturgeon sediment toxicity test exposure chambers as set-up at the University of Saskatchewan, Aquatic Toxicity Research Facility. Close-up of flow bars and sediment exposure chamber employed for the duration of the study.



Photo D-6. White sturgeon sediment toxicity test exposure chambers as set-up at the University of Saskatchewan, Aquatic Toxicity Research Facility. Close-up of dedicated recirculating systems employed for each sediment exposure chamber duration of the study.



Photo D-7. White sturgeon sediment toxicity test exposure chambers as set-up at the University of Saskatchewan, Aquatic Toxicity Research Facility. Close-up of dedicated porewater extraction portals for ceramic airstones employed for the duration of the study.



Photo D-8. White sturgeon sediment toxicity test exposure chambers as set-up at the University of Saskatchewan, Aquatic Toxicity Research Facility. Close-up of sediment exposure chamber containing white sturgeon as employed for the duration of the study.

