

Attachment B

DRAFT Process and Results for Updating LCREP Long-term Toxics Monitoring Plan including meeting notes for:

- October 27, 2010
- December 9, 2010
- April 13, 2011

Prepared for: Columbia River Toxics Reduction Working Group
Monitoring Subgroup

Prepared by: Mike Cox, EPA

Columbia River Toxics Monitoring Subgroup

Summary and Results of Process to Update LCREP Long- Term Monitoring Plan for Toxics

**Columbia River Toxics
Monitoring Subgroup**

April XXXX, 2011

**Columbia River Toxics Reduction Working Group: Monitoring Subgroup
Process and Results for Updating LCREP Long-term Toxics Monitoring Plan
(Draft)**

Purpose: Review and update, if necessary, sampling sites from the 1999 LCREP Long-term Monitoring Plan for toxics in water, sediment, and biota

Background

In 1999, LCREP finished a long-term monitoring plan as part of their NEP management plan. One component of that long-term monitoring plan was a section that discussed sampling for toxics in water, sediments, and biota. The toxics portion of the plan needs to be updated for several reasons: the NEP program requires periodic updates; the Action Plan for the Columbia River includes an initiative to assist LCREP to update the plan; and to prepare for any possible resources available for monitoring in the future.

The Columbia River monitoring subgroup has been developing a monitoring prioritization tool for the Columbia River Basin over the past several years. The purpose of the tool is to assist agencies in prioritizing where to conduct monitoring for toxics. While the tool is designed for the entire Basin, the monitoring subgroup decided it was important to test the tool in one section of the Columbia. Given this, members of the subgroup began discussing with LCREP the possibility of using the tool to assist LCREP in updating their Long-term Monitoring Plan for toxics.

In the spring of 2010, several representatives of the monitoring subgroup met with LCREP to discuss the idea of testing the prioritization tool in the Lower Columbia. A missing element of the prioritization tool was the environmental condition data. It was decided that LCREP would hire GSI consultants to pull together the existing data on a limited set of chemicals and media to assist in the project.

In October 2010, several members of the monitoring subgroup met in Portland to discuss the project and to prepare for a meeting for December on updating LCREP's monitoring plan. The action items from that meeting are in Appendix 1. After much discussion, it was decided that GSI would collect all the available data for a limited set of chemicals and in specific media. The initial list of chemicals and media to be included is in Appendix 1.

In December 2010, the monitoring subgroup met in Portland to continue discussions on how to update the 1999 monitoring plan for toxics. Based on the meeting, GSI was tasked to complete additional analysis for the next meeting. A summary of the action items from that meeting are included in Appendix 2.

As a follow-up to the December meeting, LCREP, USGS, and EPA met to discuss the direction for this initiative. Given the constraint on time and resources for completing an update of the whole long-term monitoring plan for toxics, it was decided that the best course of action, at this time, would be to concentrate on reviewing and updating, if necessary, the sampling sites selected for toxics in water, sediments, and biota from the 1999 report. Also, it was decided that trying to utilize the prioritization tool in helping to update the monitoring plan was not practical given the time and resource constraints.

Based on this, GSI was been asked to review all the available data, and provide to the working group prior to the April 13th meeting their recommendations on whether to retain, add, or update the sampling sites for toxics. Appendix 3 provides an agenda and details for the April 13th meeting.

Outcomes from April 13th Meeting

At the April 13th meeting, the monitoring subgroup reviewed all the data provided by GSI and EPA. There were three main sources of data: 1) maps for each chemical and the concentration of the chemical within specific ranges for the Lower Columbia including different toxicity thresholds; 2) graphs for each chemical with the concentrations by river mile; and 3) frequency distributions for each chemical with and without Willamette River data. The group provided observations on the data, questions that the data raise, and recommendations for future work.

After review of the data, the group used the recommendations on sampling sites from the 1999 LCREP report as a starting point for making recommendations whether to retain, delete, or add additional sampling sites. The group started at the Bonneville Dam and went to the Columbia River Estuary. There was a discussion for each site and whether the monitoring site would be utilized for status and trends or source tracking. It was decided that more detailed research was needed in order to make any recommendations in sampling sites in the Estuary. Several site selection criteria for monitoring stations were proposed:

- Fixed station design for status and trends
- Track trends associated with major inputs (i.e., tributaries, urbanized centers, etc)
- Area has shown elevated concentrations for one or more mapped parameters in water, sediment, or tissue
- Should be at least one station in each reach of the river
- Include a mix of tributary based stations and main stem stations.

A list of the proposed sampling stations is included in Appendix 3. The group suggested dropping two sites and adding 3 sites. In total, the group recommended 16 sites for status and trends monitoring and seven sites for source tracking. The group agreed that this list was more inclusive than probably needed, but for this exercise it was decided to retain the sites if there was good reason. The list will probably need to be modified based on the purpose of any monitoring program and the resources available.

The summary meeting notes from the April 13th are included in Appendix 3 along with the data sheets generated. LCREP will post the data set generated by GSI on their website.

Appendix 1

Columbia River Toxics Reduction Working Group Monitoring Subgroup Summary and action items from Wednesday October 27th meeting Portland Oregon

Attendees: USGS - Greg Fuhrer, Jennifer Morace, and Steve Waste; NOAA: Lyndal Johnson; LCREP: Catherine Corbett; GSI: Heidi Blischke, Nicole Landsberg; PSU: Gwynn Johnson and Maren Fulton; EPA: Lorraine Edmond, Helen Rueda, and Mike Cox

Purpose of meeting: Prepare for November 17th meeting with LCREP. Purpose of November 17th meeting is to begin updating the toxics monitoring strategy for the Lower Columbia.

Action Item	Responsible	Due date	Comments
Discuss how to best utilize maps, graphs, etc for 11/17 meeting	Mike/Catherine/Greg	Meet week of 11/1	Mike will send out possible dates. Will need Peter (EPA) and Nicole (GSI) to discuss capabilities.
Provide GSI with short list of chemicals to map for 11/17 meeting for sediments, water, and tissue	Mike/Greg	11/1 to Heidi	We will rely on work completed at 2009 Toppenish meeting
Develop distribution graphs using different screening levels for the chemicals identified above.	Heidi	11/15 to workgroup	The graphs will use different screening levels for sediments, water, and tissue.
Develop graphs showing concentrations of chemicals by river mile	Heidi	11/15 to workgroup	This will be done if resources allow. The idea is to see if there are hot spots for these chemicals
Review background information from WARP model to see if they have screening values for pesticides in data collected by GSI.	Heidi (Mike will provide link to Heidi)	11/15 to workgroup	The WARP model includes screening values for a large set of pesticides.
Ask EPA pesticide program if they have screening values for pesticides in data collected by GSI	Mike/Lorraine	11/5 to Heidi	We will use list of constituents used by GSI.
Add SPMD	Heidi	11/15 to workgroup	There is SPMD data that are not included because they are not reported as ng/L.
Review all data for stressors but especially for industrial, phosphorous, and WWTP	EPA	11/15 if modifications to workgroup	There was concern that some of the outputs did not make sense. Need to review data.

Action Item	Responsible	Due date	Comments
Scan 1999 long-term monitoring plan and put on LCREP website	Catherine	11/5	We only have paper copies of 1999 report.
Discuss what portions of 1999 report maybe useful as starting point for discussions	Mike/Greg/Catherine	11/5 initial discussions	We do not want to recreate portions of the report that are useful.
Revise headers on spreadsheets	Helen	11/15	Revise the headers so they are simple and reflect what we are trying to represent.
Ask additional people to 11/17 meeting	Mike	11/3	Want to ensure we have representation from States, tribes and FWS.
Discuss with Jim Ruff status of update to Councils sub-basin report	Mike/Greg	11/17	Council has report that looks at sub-basins. May see if similar to ours.
Plot hazardous waste sites	Mike	As possible	We will discuss with GIS folks about mapping.

Columbia River Toxics Reduction: Monitoring Subgroup Proposed constituents for GSI mapping

At our meeting on Wednesday October 27th we discussed providing direction to GSI on the constituents and the media for which they would develop maps. GSI compiled data for several analyte groups for biological samples, sediment data, water column, and SPMDs with varying number of analytes for each media.

- Flame Retardants (PBDEs)
- Metals (14)
- PAHs (four categories plus Benzo(e)pyrene)
- PCBs (Sum of Aroclors and/or Sum of Congeners)
- Pesticides (17 -20 depending on media)

Because of restraints on resources it was decided to limit the number of analytes and media to develop more detailed maps. In order to prioritize which analytes and media to select we are proposing to use the following criteria.

1. Are there screening levels for the analyte in the media?
2. Does the analyte represent one of the stressors used in the monitoring prioritization tool?
3. Is there sufficient number of samples compiled?
4. Is it considered a high priority for monitoring "trends" according to the matrix of media and contaminants developed in Toppenish?
5. For current use pesticides, is it a frequently used in the Basin?

The matrix developed in Toppenish grouped analytes into eight groups: trace elements; PAHs; hydrophilic pesticides; hydrophobic pesticides; estrogenic compounds; bioaccumulative compounds; lead, and mercury. The groups are generally consistent with the groups of data compiled by GSI. The table below summarizes our proposal.

Analyte Group	Tissue	Sediment	Water	Comment
PBDEs	Yes			Screening level for tissue available, represents human activity, sufficient data points, and important for trends monitoring.
Metals	Mercury		Cooper	Mercury is concern for fish consumption. Assume majority of mercury in fish is methyl mercury. Cooper is a growing concern for fish. Both have standards, represent mining although probably not the main source in the Lower Columbia, and both have sufficient data points
PAHs		Benzo-a-pyrene		Use Benzo-a-pyrene to represent PAHs. Screening levels present, sufficient number of samples
PCBs	Sum of aroclors			Screening levels present, sufficient number of samples
Pesticides - Legacy	DDT	DDT		Represent legacy pesticides. Screening levels present, still found in fish.
Pesticides - Current			Chloropyrifos	Screening levels available. Large amount used. Sufficient data.

Appendix 2

Columbia River Toxics Reduction Working Group: Monitoring Subgroup

Thursday December 9th

9:00 - 3:00

LCREP

811 SW Naito Parkway, Suite 120

Portland, Oregon

Purpose of meeting: Begin discussion of updating LCREP's toxics monitoring plan for the Lower Columbia River

Draft Agenda

9:00 - 9:30 Introductions/purpose/review action items from last meeting (would attach action items from last meeting).

9:30 - 10:30 Review 1999 report (would attach report and include principals and objectives in email to make it easier)

- Discuss 7 principals for monitoring program from 1999 report and update as needed
- Discuss scope (e.g., Toxics in water, sediment, and biological tissues)
- Discuss objectives for monitoring in general and specifically for toxics
- Discuss possible measures of success/targets/indicators

10:30 - 12:00 Review data (will provide data that is ready to share)

- Cumulative distribution graphs
- River mile graphs
- Stressors: Population density, current use pesticide data, Phosphorous, Industrial, and WWTP
- What additional is needed

12:00 - 1:00 Lunch

1:00 - 2:30 Continue data review

2:30 - 3:00 Discuss proposed timeline and process for updating (we could discuss this on November 8th with Catherine)

Columbia River Toxics Reduction: Monitoring Subgroup
Action items from December 9th 2010 meeting in Portland

Attendees: USGS - Greg Fuhrer, Jennifer Morace, Steve Waste, and Tony Paulson; NOAA: Lyndal Johnson; LCREP: Catherine Corbett; GSI: Heidi Blischke, Nicole Landsberg; PSU: Gwynn Johnson; EPA: Helen Rueda, and Mike Cox; WADOE: Dale Norton; WADOH: Dave McBride

Topic	Observations	Action(s)
Status	<ul style="list-style-type: none"> Long-term monitoring plan was developed in 1999 that included toxics monitoring plan. Need to update toxics monitoring plan for several reasons: NEP requires period updates; EPA action plan for Columbia River includes assisting LCREP to update plan; and to prepare for any possible resources available for monitoring. 	<ul style="list-style-type: none"> No actions
Direction	<ul style="list-style-type: none"> Use 1999 Report as the starting point for developing status/trends monitoring plan. Resources limited so need to balance level of effort with desired product. Need to go beyond status and trends if we want to identify sources and initiate reduction actions. 	<ul style="list-style-type: none"> In January meet with LCREP and monitoring subgroup members to: 1) develop timeline for updating toxics monitoring plan; 2) members for workgroup; and 3) desired product.
Lines of evidence work	<ul style="list-style-type: none"> LOE work may help to ID sites for status/ trends monitoring and source identification. Need to evaluate which LOE can be refined to assist to ID locations or areas for sampling. 	<ul style="list-style-type: none"> EPA will look at each LOE and evaluate how refined the data can get for each evaluation area. EPA will finish documenting how we developed each stressor. EPA received resources to conduct peer review workshop for its LOE approach. Need to schedule workshop.
Data	<ul style="list-style-type: none"> Data will help to make decisions on monitoring plan. Need to balance effort to compile data and resources available. Need to make database accessible to everyone on working group. Need to decide who will host database 	<ul style="list-style-type: none"> GSI will put data base on a share point site We will review data to ensure relevant data is in data base If missing data, discuss with GSI how to get data into format that makes is easy to upload into database GSI will provide data to use with Google Earth Need to decide who will host database.

Topic	Observations	Action(s)
General modifications to GSI work	<ul style="list-style-type: none"> Discussed the importance of separating the Willamette River data. Need to evaluate whether trends over time and trends upstream to downstream. Need to put SPMD data into one format and display separately from biological or water data. 	<ul style="list-style-type: none"> GSI will provide non-Willamette data to Lil and she will redo frequency graphs and summary statistics GIS will breakout main stem into 8 regions using classification scheme provided by LCREP. GIS will divide data into pre 2000 and post 2000 GIS develops an example box and whiskers using DDx for each region divide out pre 2000 and post 2000 GIS develops an example plot of the DDx without box and whiskers. We will discuss results from this example and decide how to proceed with the other contaminants
DDx – Sediments and Biological	<ul style="list-style-type: none"> Samples equally distributed throughout area High detection limits River miles 10, 35, and 100 seem to have higher levels 	<ul style="list-style-type: none"> See above
PBDEs – Biological	<ul style="list-style-type: none"> Limited data Corbicula is majority of data and high 	<ul style="list-style-type: none"> Mike will talk with Chuck Henny about getting his recent data on osprey and putting into format that would make uploading data easier. Dale and Jennifer will send SPMD data to Heidi GIS will develop a separate map for SPMD data.
PCBs – Sediments and Biological	<ul style="list-style-type: none"> River miles 75-85 seem higher 	<ul style="list-style-type: none"> Use total PCB data instead of just Aroclors Do trend data like DDX. Dale and Jennifer will send SPMD data to Heidi
PAHs – Sediments and Biological	<ul style="list-style-type: none"> Majority of data non-detects 	<ul style="list-style-type: none"> GIS will use total PAHs instead of Benzo-a-pyrene GIS will do trend data like DDX if enough detects. Dale and Jennifer will send SPMD data to Heidi GIS will incorporate biological data if time and resources allow.
Copper – Water	<ul style="list-style-type: none"> Limited data but data seems to be missing. 	<ul style="list-style-type: none"> USGS will evaluate possibility of accessing NWIS to get copper data
Mercury – Biological	<ul style="list-style-type: none"> Levels generally low compared with other areas in Basin 	<ul style="list-style-type: none"> No actions
Chlorpyrifos – Water	<ul style="list-style-type: none"> Limited data 	<ul style="list-style-type: none"> No actions

Appendix 3

Columbia River Toxics Reduction Working Group: Monitoring Subgroup

Wednesday April 13th, 2011

9:00 - 3:00

LCREP

811 SW Naito Parkway, Suite 120

Portland, Oregon

Attendees: USGS - Greg Fuhrer, Jennifer Morace, Elena Nilsen, and Tony Paulsen; NOAA: Lyndal Johnson; LCREP: Catherine Corbett; GSI: Heidi Blischke; PSU: Gwynn Johnson; EPA: Helen Rueda, Lorraine Edmond, and Mike Cox; WADOE: Dale Norton (by phone); WADOH: Dave McBride

Agenda

- | | |
|---------------|--|
| 9:00 - 9:15 | Purpose |
| 9:15 – 10:00 | <p>Review main action items from December 9th Meeting</p> <ul style="list-style-type: none">- EPA updates Lines-of-Evidence approach (in-process) and establishes date for peer input workshop (June 14-15 Portland)- GSI will put data base on a share point site (completed)- Group will review data to ensure relevant data is in data base (not completed)- GSI will provide data to use with Google Earth (to be completed after all data is compiled)- LCREP will host database (completed)- GSI will provide non-Willamette data to Lil and she will redo frequency and summary statistics (need to complete)- GIS will breakout main stem into 8 regions using classification scheme provided by LCREP (completed)- GSI will divide data into pre 2000 and post 2000 (completed)- Dale, Jennifer, and Mike will send data (completed)- GSI will develop a separate map for SPMD data (completed)- GSI will use total PCB data instead of Aroclors and total PAHs instead of Benzo-a-pyrene (completed)- USGS will evaluate possibility of accessing NWIS to get copper data (completed) |
| 10:00 – 10:30 | GSI reviews sampling sites in the 1999 report for toxics in water, sediment, and biota in light of the data obtained recently by GSI |
| 10:30 – 12:00 | GSI presents recommendations on whether to maintain or update sampling sites |
| 12:00 – 1:00 | Lunch |
| 1:00 – 2:30 | Continued discussion on sampling sites |
| 2:30 – 3:00 | Next Steps and wrap-up |

April 13th meeting notes

Mercury

- Pre-2000 data had more outliers; apparent decrease since pre 2000
- Post-2000 had a little higher concentrations upriver than downstream
- No big spikes; no obvious sources; general signature of little dec from upstream to downstream
- Higher concentrations in Willamette than Columbia
- Above risk based thresholds in both rivers

Questions:

- Population of samples re: trophic levels and size
- Need to assess if decrease since pre 2000 is true or result of samples
- Osprey data missing. For PBTs the osprey data set is very valuable for trend monitoring. It has a series of fixed stations and long historical record. The implication is “how does your monitoring station selection nest with other monitoring programs. Example: recommend that osprey monitoring continues at X recommended stations and LCREP plan recommends supplementing these stations with fish tissue monitoring.

Recommendation:

- Distributed sample locations in mainstem (> 3 stations-upstream, middle, lower)
- Ensure samples in Willamette (>2-upstream and downstream)
- Consider monitoring for other metals than mercury.

PBDEs

- No pre-2000 data, so no comparison
- Limited data—mostly upriver; most concentrations are elevated (@20% are above risk thresholds); a few non-detects
- Little data in Willamette R, but existing results are high

Questions

- Diagnostic studies to determine if results in Columbia are a signature of Willamette
- Determine if beginning to trend down based on new regulations
- Osprey data, BES archived data, salmon downstream, EP 2005 data are missing
- Need to look if our results are above new risk thresholds

Recommendation:

- Distributed sample locations in mainstem (> 3 stations-upstream, middle, lower)
- Ensure samples in Willamette (>2-upstream and downstream)
- Fill spatial data gaps in middle and lower river reaches

DDx

- Pre-2000 data had higher concentrations; apparent decrease since pre 2000
- Post-2000 shows high concentrations at mouth
- Except @mouth, no big spikes; no obvious sources (except in WR)
- Higher concentrations in Willamette than Columbia (@ RM 7 in WR from PDX Harbor)
- In biological samples, mostly bird eggs show above risk levels by DDx results; sediment samples @10% samples exceed sediment guidelines

Questions

- Diagnostic studies to determine if results in upstream Columbia are a signature of Willamette
- Resolve detection issues
- Osprey samples; EP 2005 samples; USACE samples for dredging are missing?

Recommendation:

- Distributed sample locations in mainstem Col. (> 3 stations-upstream, middle, lower)
- Ensure samples in Willamette (>2-upstream and downstream)
- Focused samples in mouth or Reach A of Col.
- Fill spatial gaps in biological samples between RM 10 and 40 of Col.

PCBs

- Little pre-2000 data, so no comparison
- Limited data; could be spikes
- Post-2000 data show an urban signature
- Willamette R data show elevated concentrations near PDX Harbor
- Col. R data elevated and above risk based thresholds

Questions

- Map pre-2000 data
- **Units need to be checked**
- Mapped Col Slough data should be shown as WR instead as part of mainstem Col. R

Recommendation:

- Distributed sample locations in mainstem (> 3 stations-upstream, middle, lower)
- Ensure samples in Willamette (>2-upstream and downstream)
- Focused samples above RM 65 in Col.

PAHs

- No apparent trend from pre-2000 to post-2000
- Both pre and post-2000 shows urban signatures or elevated concentrations at mouth, Longview and Portland
- Higher concentrations in Willamette than Columbia (industrial areas in WR—entire lower river)
- @5% data are above effect thresholds

Recommendation:

- Distributed sample locations in mainstem (> 3 stations-upstream, middle, lower)
- Ensure samples in Willamette (>2-upstream and downstream)
- Fill spatial gaps above RM 110

Copper and chlorpyrifos in water

- Very limited data

Recommendation:

- Distributed sample locations in mainstem (> 3 stations-upstream, middle, lower)

- Ensure samples in Willamette (>2-upstream and downstream)
- Focused samples to fill spatial gaps throughout

Toxics Reduction Working Group Subgroup Recommendations*:

Location recommended in 1999 report	Type Sample	River Mile	Updated Recommended Locations (as of 4/13/11)	Type of Monitoring (status and trends or source tracking**)
Columbia River, Warrendale	SS	141	Columbia River, Warrendale @ RM 141	Status and trends
Columbia River upstream of Camas and Sandy River	SS	122	DROPPED this station	
Columbia River downstream of Camas and Sandy River	SS/BS	~115	Columbia River downstream of Camas and Sandy River @~RM 115	Status and trends
			ADDED: Columbia River between RM 102 and 115	Source tracking
Columbia River upstream of the Willamette River	SS/BS	102	Columbia River upstream of the Willamette River @ RM 102	Status and trends
			ADDED: Columbia Slough near confluence with Willamette River	Source tracking
Willamette River upstream of mouth – St. Johns Bridge	SS		Willamette River upstream of mouth – Morrison Street Bridge	Status and trends
Willamette River upstream of mouth – At upstream end of Multnomah Channel	SS		Willamette River upstream of mouth – At upstream end of Multnomah Channel	Status and trends
Willamette River @ the Falls	SS		Willamette River @ the Falls	Status and trends
Columbia River upstream of Multnomah Channel	SS	~93/94	RM 93/94 (upstream of Multnomah Channel, downstream of Willamette)	Status and trends
Lake River – downstream of Vancouver Lake	SB	~90?	Lake River – downstream of Vancouver Lake	Status and trends; Source tracking
Multnomah Channel downstream end near Scappoose Bay	SB	~89?	Multnomah Channel downstream end near Scappoose Bay	Status and trends
Mouth of the Lewis River	SS/SB	~87	Mouth of the Lewis River	Status and trends; Source tracking
		~88	ADDED: mouth of Scappoose Bay	Source tracking
Columbia River upstream of Columbia City	SS/SB	85	DROPPED this station	
Columbia River @ Columbia City	SS/SB	83	Columbia River @ Columbia City	
Kalama River at Mouth	SS	73	Columbia River downstream of Kalama River @~RM 73	Status and trends
Cowlitz Mouth – 2 locations upstream and downstream of mouth	SS/SB	68	Columbia River at confluence with Cowlitz River (1 station; see below for 2 nd station)	Status and trends; Source tracking
		~65	Columbia River below confluence with Cowlitz River and downstream of Longview	Status and trends; Source tracking
Columbia River @ Beaver Army Terminal	SS/SB	53	Columbia River @ Beaver Army Terminal	Status and trends, ECY will continue to monitor with SPMDs

Cathlamet Channel	SS	~49	Between RM 40 and Beaver Army Terminal	Status and trends
Columbia River Estuary – numerous locations	SS/SB	<40	More detailed research needed; stratified random, probabilistic design recommended	Status and trends

*The subgroup did not review or update those locations upstream of Bonneville Dam in this effort.

**Based on initial brief review; a more thorough assessment for source tracking stations should be completed in future.