

# Citizens for a Clean Columbia

Our mission: to advocate for a clean Columbia River ecosystem  
NEWSLETTER JULY 2017

## Who are we?

Citizens for a Clean Columbia (CCC) is a volunteer organization focused on advocating for the health of the Upper Columbia River (UCR) and Lake Roosevelt. Visit us at [www.cleancolumbia.org](http://www.cleancolumbia.org).

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## News in Brief

### Residential Soil Study 2016: Northport, WA

- 144 residential properties were sampled between August and October 2016.
- Thirteen residences (9%) had one or more decision units (DUs) with a screening level exceedance – 7 for lead only, 1 arsenic only, 1 cobalt only, and 4 for lead, arsenic with or without other metals.
- Some questions generated during the October 2015 meeting in Northport about the 2014 residential soil study have been answered.

### Columbia River Treaty update

- John Osborn, a Northwest physician with the Ethics & Treaty Project provides an update.

### Soil Amendment Technology Evaluation Study

- This fall, work will begin to identify appropriate soil amendment technologies to reduce the long-term potential for human exposure to lead in shallow soils in the UCR area.

### Technical Advisor Update

- Joe focused on the 2016 residential soil study, the macroinvertebrate study, the 2013 sediment toxicity data summary report, the upland soil split sample results memorandum, the data summary report for the 2016 sturgeon fillet study, and the soil treatability study.

## Residential Soil Study in 2016

This study is an expansion of the 2014 residential study that found aerial contamination above national screening levels for lead (400 mg/kg) and arsenic (20 mg/kg) on 24 of the 74 properties (32%) sampled. The 2014 study findings are described in our July 2015 newsletter. Additional information can be found in the EPA fact sheets on CCC's website or on the [epa.gov](http://epa.gov) website searching under "region10 Upper Columbia River remedial investigation".

The 2016 study was led by Teck America, Inc. (TAI) and extended the southern boundary of EPA's 2014 Residential Soil Study to approximately the intersection of Williams Lake Road and Highway 25. There were 452 DUs sampled from 144 residential properties using two types of samples:

- "Discrete" samples collected from a DU at 0 to 1 inches (in) and 1 to 6 in. deep (348 total samples).
- "Incremental composite samples" for which soil was collected from 0 to 1 in. deep at 30 places within each DU and then combined into one sample (740 total samples).



Surface soils collected from these properties were tested for metals including aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc.

Among discrete samples, most metals were below human health screening levels. Mean arsenic level was 12.3 mg/kg (range 2.25-151) at 0-1 in. and 11.6 mg/kg (2.23-54.4) at 1-6 in. Mean lead level was 157 mg/kg (range 9.03-1540) at 0-1 in. and 109 mg/kg (6.71-840) at 1-6 in.

For composite samples, arsenic and lead levels were adjusted for bioavailability. The following metals were above screening levels:

- Arsenic 33/452 (9/452 if adjusted)
- Cadmium 1/452
- Cobalt 1/452
- Lead 15/452 adjusted
- Manganese 1/452
- Thallium 2/452

Duplicate and triplicate samples were obtained for quality assurance. For discrete sample duplicates, only 1.7% (0-1 in) and 4.4% (1-6 in) of metals were outside of the acceptable +-35% RPD relative percent difference and for composite triplicates, only .08% were outside the RSD (relative standard deviation) >30%.

The EPA plans to hold a community meeting to discuss these results and remediation in the fall.

In follow-up to questions generated during the prior Northport meeting in October 2015, we now have answers from Laura Buelow to share for some:



**Q1: Who is doing the studies? Provide a diagram of who is involved (Teck's organizational chart)**

U.S. EPA is the federal agency responsible for investigating the Upper Columbia River. EPA had a Settlement Agreement with Teck to conduct the remedial investigation/feasibility study (RI/FS). Under that Settlement Agreement, Teck funds all the RI/FS (including EPA's involvement). Teck is the lead for the RI/FS in general, including the ecological risk assessment. This means that Teck (and their contractors) prepare the documents and submit them to EPA. EPA must approve all documents (sampling plans, data summary reports, etc.). Teck also hires the contractors to conduct the field sampling. The field sampling is conducted according to the plan approved by EPA, and with EPA oversight. The human health risk assessment is conducted by EPA. Teck can review and provide comments on it. The EPA Project Managers (currently Monica Tonel and Kathy Cerise) works with Teck American Inc.'s Project Manager (currently Kris McCaig).

In addition, EPA has a Memorandum of Understanding with U.S. Department of Interior, the Confederated Tribes of the Colville Reservation, the Spokane Tribe, and Washington State Department of Ecology who review and provide technical input on all draft documents. They also are part of the Cultural Resources Working Group, which reviews all

sampling plans to determine what type of cultural monitoring is needed for the field sampling. Teck provides the funding for their involvement.

CCC has a technical assistance grant with EPA (funded by Teck) to provide funding for a technical advisor. The technical advisor reviews all draft documents and provides technical input as well as general feedback from the community on the ongoing work.

Teck's organization chart can be obtained from Kris McCaig. They have had some changes and she would be the best person to get the information from.

**Q2. What can you tell us about using plants to remove contamination (phytoremediation, garden plant uptake, exposure from foraging for food)?**

Using plants to remove contamination is also called phytoremediation and phytotechnologies. Phytotechnologies are broadly defined as the use of vegetation to address contaminants in soil, sediment, surface water and groundwater.

Plants can help clean up many types of contaminants including metals, pesticides, explosives, and oil. However, they work best where contaminant levels are low because high concentrations may limit plant growth and take too long to clean up. Plants also help prevent wind, rain, and groundwater flow from carrying contaminants away from the site to surrounding areas or deeper underground. Cleanup objectives for phytotechnologies can be contaminant removal and destruction, control and containment or both.

Phytoremediation is a low-risk and attractive cleanup method. Fences and other barriers are constructed to keep wildlife from feeding on contaminated plants. In certain instances, plants

may release chemical vapors into the air in a process called "phytovolatilization." When this occurs, workers sample the air to make sure the plants are not releasing harmful amounts of vapors.

Phytoremediation cleanups cause little disruption to the site or surrounding community. Initial work may involve grading or tilling of the soil with earth-moving equipment, and backhoes may be needed to plant trees and large shrubs. Residents and businesses near the site may hear equipment noise or detect an odor if fertilizer is added to the soil. Any airborne dust can be minimized by watering down the soil. Plants used for phytoremediation can make a site more attractive. The use of native plants is encouraged since they are better adapted to the area's conditions and less likely to attract nuisance animals or pests.

Phytoremediation of lead in soils, however, is ineffective since lead is generally not available for plant uptake. Use of soil amendments is an effective way to reduce potential exposure. (This is being explored for our site now).

**Q3. Is it safe to eat produce from our gardens (fruit and vegetable plant uptake) and plants we collect (exposure from foraging for food)?**

In general, plants that produce fruiting bodies (e.g., tomatoes, squash, apple and pear trees, and berries) are most appropriate for growing in potentially contaminated soil. In contrast, root and tuber crops (e.g., carrots, potatoes and onions) are often the least appropriate plants to grow in potentially contaminated soil, as the edible portions of the crops are in direct contact with the soil. Vegetables with large outer leaves (e.g., cabbage, lettuce and collard greens) are easily contaminated by dust and soil splashback, so careful washing of these plants is necessary.

Lead and arsenic concentrations in crop plants grown on soil containing lead and arsenic are too low to cause acute poisoning in humans. The health concern is that extra lead and arsenic in or on plants grown on lead- and arsenic-enriched soils add to total intake of these elements. Because lead and arsenic occur naturally in all soils, it is impossible to grow plants completely free of lead or arsenic. Concentrations of lead and arsenic in soil may be 10 to 1000 times greater than their concentrations in plants growing on that soil. Because of this, failure to remove soil particles that adhere or become trapped on the outside surfaces of garden crops can substantially increase dietary lead and arsenic obtained by eating garden plants.

- Wash garden crops grown on lead- and arsenic-enriched soils with water before bringing them into the house. This removes most soil particles, reduces the lead and arsenic content of the crops, and reduces the transport of soil lead and arsenic into the home.
- Once you have brought the produce inside, wash it again carefully, using edible soap or detergent (sold at many supermarkets), water, and a scrub brush to remove remaining soil particles. Pay particular attention to crops like broccoli having rough exposed exteriors that can trap soil. Leafy plants having large surface areas (such as lettuce and swiss chard) can trap and retain large quantities of dust.
  - Pare root and tuber crops (such as potatoes, carrots and radishes) and discard the parings.
  - Do not compost unused plant parts, peelings, and parings for later use in the garden. These practices will reduce the lead and arsenic content of harvested home garden produce to the lowest possible levels.

#### **Q4. What can you tell us about causes of Inflammatory Bowel Disease (Crohn's disease, ulcerative colitis)?**

EPA doesn't have a role in research on these diseases, however, the following information, taken from some of the latest scientific literature, may be helpful:

Inflammatory bowel disease (IBD) involves chronic inflammation of all or part of the digestive tract. IBD primarily includes ulcerative colitis and Crohn's disease. No one knows for sure what causes inflammatory bowel disease (IBD). Experts think that abnormal action of a person's immune system may trigger IBD. The immune system is made up of various cells and proteins. Normally, the immune system protects the body from infections caused by viruses or bacteria. Once the infection has cleared up, the immune system "shuts off." When your immune system tries to fight off an invading virus or bacterium, an abnormal immune response causes the immune system to attack the cells in the digestive tract, too. In this way, IBD is thought to be an auto-immune disease.

There are several factors that contribute to the development of IBD. Scientific research has identified over 100 genes associated with IBD. Having a parent who has IBD puts the child at greater risk of developing the disease as compared to the general population. However, the exact cause of IBD is not known and still under research. Diet and stress may aggravate but don't cause IBD. Heredity plays a role in that IBD is more common in people who have family members with IBD. However, most people with IBD don't have a family history.

#### **Q5. What are "Screening Levels"?**

The screening levels (SLs) presented on this site are developed using risk assessment guidance from the EPA Superfund program and can be used for Superfund sites. They are risk-based concentrations

derived from standardized equations combining exposure information assumptions with EPA toxicity data. SLs are considered by the Agency to be protective for humans (including sensitive groups) over a lifetime; however, SLs are not always applicable to a particular site and do not address non-human health endpoints, such as ecological impacts. The SLs contained in the SL table are generic; they are calculated without site-specific information. They may be re-calculated using site-specific data.

#### **Q6. Why do we use “Screening Levels”?**

They are used for site "screening" not for cleanup standards. The SL's role in site "screening" is to help identify areas, contaminants, and conditions that require further federal attention at a particular site. Generally, at sites where contaminant concentrations fall below SLs, no further action or study is warranted under the Superfund program, so long as the exposure assumptions at a site match those taken into account by the SL calculations. Chemical concentrations above the SL would not automatically designate a site as "dirty" or trigger a response action; however, exceeding a SL suggests that further evaluation of the potential risks by site contaminants is appropriate. SLs are also useful tools for identifying initial cleanup goals at a site. In this role, SLs provide long-term targets to use during the analysis of different remedial alternatives. By developing SLs early in the decision-making process, design staff may be able to streamline the consideration of remedial alternatives.

#### **Q7. How do SLs differ from cleanup standards?**

SLs are generic screening values, not de facto cleanup standards. Once the Baseline Risk Assessments (both human health and ecological) are completed, site-specific risk-based remediation goals can be derived using the results. The selection of final cleanup goals may also include Applicable or Relevant and Appropriate Requirements as well as site-specific risk-based goals.

In the Superfund program, this evaluation is carried out as part of the nine criteria for remedy selection outlined in the National Oil and Hazardous Substances Pollution

Contingency Plan (NCP). Once the nine-criteria analysis is completed, the SL may be retained as is or modified (based on site-specific information) prior to becoming established as a cleanup standard. This site-specific cleanup level is then documented in the Record of Decision.

#### **Q8. Where did the inorganic lead SL value in the Table come from?**

Lead does not have a screening level developed the way other chemicals do. EPA considers lead to be a special case because of the difficulty in identifying the classic "threshold" needed to develop a Reference Dose.

EPA therefore evaluates lead exposure by using blood-lead modeling, such as the Integrated Exposure-Uptake Biokinetic Model (IEUBK). EPA has traditionally used 400 parts per million (ppm, same as mg/kg) as a screening level for lead in soil. This means that below 400 ppm is safe for everyone, including young children who are most susceptible to lead. This was based on having less than 5% probability of exceeding a 10 µg/L/dL blood-lead level for a typical child. There are newer data from the Center for Disease Control suggesting that 10 ug/L/dL blood-lead is not protective enough, and therefore the screening level may drop below 400 ppm in the future. This has not been finalized by EPA and there is no date as to when it may change.

#### **Q9. What can you tell us about property values (message to Realtors)?**

EPA cannot provide advice on property values to buyers or sellers. Sellers are required to disclose:  
<http://apps.leg.wa.gov/RCW/default.aspx?cite=64.06>

#### **Q10. What will happen to the properties above 250 mg/kg and below the Time Critical Removal Action of 700 mg/kg (legacy issues)?**

EPA will use the results of the human health and ecological risk assessments (which includes site specific information) to determine a cleanup number specifically for this area. It may or may not be below 700 mg/kg for lead. After the RI/FS is finished, EPA will develop a

Proposed Plan, which is our recommendation of what cleanup actions should occur. This goes out for public comment and the public is highly encouraged to give feedback. Once we review all the feedback, we will document the decision in a Record of Decision.

### **Q11. What happened to that contaminated border soil?**

For information call the Stevens County waste management number in the phone book: 866-205-9220.

\*\*Remaining to be addressed are these questions:

- What can you tell us about air monitoring for the RI/FS?
- What can you tell us about mercury in the Columbia River / Lake Roosevelt sediment?
- The unpaved roads have a lot of dust on them – are we at risk from road dust? Is the road dust re-contaminating the cleaned-up properties?

Mindy Smith, CCC secretary

### **Columbia River Treaty (CRT) update**



CCC participates in the Columbia Round Table, a group dedicated to the addition of an ecosystem arm to the CRT. Recently, John Osborn, provided a news release from June 22, 2017 for our newsletter. Below are excerpts; the entire text can be read at: [http://www.celp.org/2017/06/22/northwest-british-](http://www.celp.org/2017/06/22/northwest-british-columbia-need-to-stand-together-to-modernize-the-columbia-river-treaty/)

[columbia-need-to-stand-together-to-modernize-the-columbia-river-treaty/](http://www.celp.org/2017/06/22/northwest-british-columbia-need-to-stand-together-to-modernize-the-columbia-river-treaty/).

On June 21, seven members of Congress (MOC) sent a letter to President Trump outlining the history of the CRT, encouraging treaty negotiation and threatening treaty termination. The MOC letter does not include several important historical elements, including that communities in the Columbia Basin, especially tribes and First Nations, were never consulted in writing the international river treaty. Nor does the MOC letter mention that the benefits of damming the Columbia River for hydropower and flood risk management came with wrenching costs to salmon and people who depend on the river.

In 2013, following years of discussions and thousands of letters from concerned citizens, federal agencies recommended that the State Department include restoring the river’s health (“Ecosystem Management”) as a primary purpose of an updated treaty, along with hydropower and flood control. All four Northwest states, 15 Columbia Basin tribes, fishermen and environmentalists support that recommendation. In 2016 the United States began encouraging Canada to negotiate.

Rev. W. Thomas Soeldner, a retired Lutheran minister and educator said, “Threatening Canada with treaty termination carries great risks to all life in the Basin now and into the future -- including deep drawdowns of U.S. reservoirs in Idaho and elsewhere in the Basin, which will negatively affect the Columbia River ecosystem and power generation.”

If the Treaty is terminated, the U.S. will be required to shoulder the burden of flood risk management with U.S. dams, with no guarantees of Canada’s help. This will cost the U.S. billions of dollars in flood protection and recompense from its own

dams, undermine power generation, worsen impacts on fish and wildlife, and destroy coordinated and cooperative U.S. and Canada flood risk management that has existed as an international model for more than 50 years.

“Protecting and restoring healthy salmon populations in the Columbia Basin represents an unparalleled opportunity for our region to invest in the economy, create family-wage jobs and improve our quality of life and the health of our environment,” said Greg Haller, Conservation Director for the Pacific Rivers Council.

We await the Canadian federal government’s position; their response has been delayed in the wake of the election and reorganization of the government. CCC urges our readers on both sides of the border to call for renegotiation including an ecosystem arm to the treaty.

Mindy Smith, CCC secretary

### **Soil Amendment Technology Evaluation Study (SATES)**

The objectives of the SATES are to:

- Identify appropriate technologies to reduce *in situ* bioavailability of lead in shallow soil
- Minimize long-term negative impact to habitat and use of parcels treated with these remedies
- Evaluate ancillary benefits of the remedies, such as antagonism to non-native plants
- Complete the study in technically rigorous and transparent manner

The test plots to be used in this study are three tribal allotments of between 0.4 and 4.4 acres that were identified during the 2014 soil study as being appropriate for a critical action cleanup.

There are 4 phases of the planned study. The first phase, to be completed this fall, includes fully characterizing the test plots over about 8 field days

and reviewing and selecting the soil amendments to be tested. There are six under consideration: phosphorous as MAP; wood ash; biochar; municipal biosolids (shown below), woody debris; and compost.



- Phase II will be the bench-scale treatability studies 2018- 2019
- Phase III will be test-plot field implementation 2019
- Phase IV will be test-plot monitoring 2019-2021

CCC reviewed the initial draft SATES plan and provided comments to EPA. Field reconnaissance happens the week of August 14<sup>th</sup>.

Mindy Smith, CCC secretary

### **Technical Advisor Report**

My efforts over the past six months focused on the 2016 residential soil study, the macroinvertebrate study, the 2013 sediment toxicity data summary report, the upland soil split sample results memorandum, the data summary report for the 2016 sturgeon fillet study, and the soil treatability study. CCC used my reviews as the basis for their comments to EPA.

Letters providing results of the 2016 residential soil study were sent to property owners in April 2017. The letters reported the levels of lead, arsenic and 20 additional metals for each sample obtained on the property. **Eight properties** had determined lead levels greater than 600 milligrams per kilogram for at least one sample. The scope of remediation efforts triggered by the study is currently being determined.

I reviewed several proposals for determining the relative bioavailability (RBA) of lead and arsenic for beaches sampled in the 2014 and 2016 residential soil studies. The RBA is the fraction of the total lead or arsenic that would be absorbed by the body if the beach sediment was eaten. The RBA in the original 2014 study area was significantly higher than in the downstream area added for the 2016 study; however, only two beaches had the RBA determined in the 2016 study. To have a representative sample size, the RBA for beaches sampled in the 2009-11 beach sediment study were added to the pool of beaches sampled in 2014 and 2016. This resulted in 18 beaches in the original 2014 study area and 5 beaches in the area added for the 2016 study to average for determining the RBA of lead and arsenic in these two areas. Determining the RBA is necessary for evaluating human health risk.

I was notified by several property owners who participated in the 2014 residential soil study that **archaeological holds** had been placed on areas of their property by the Washington State Department of Archaeology and Historic Preservation (DAHP) as a result of the 2014 sampling program. CCC and I found this disturbing. Our understanding was if cultural monitors found areas or items of significance, they would inform property owners during the sampling event. If the findings were of sufficient importance to file an archaeological

report, property owners would be told at the time of sampling.

None of the property owners who had archaeological holds placed on their properties were informed of any culturally significant findings by the cultural monitors accompanying the sampling teams. Property owners became aware of the archaeological holds when they contracted to have activities performed on their property, such as logging or construction.

Archaeological holds are private information and EPA does not know who might have had one placed on their property; cultural monitors do not directly place these "holds". EPA cannot ask DAHP to inform property owners of any holds on their property either. If you would like to know if an archaeological hold has been placed on any part of your property, you must contact DAHP to find out. The DAHP website is <http://dahp.wa.gov/>. Two helpful DAHP contacts are: Annie Strader 360-586-3078 and Gretchen Kaehler 360-586-3088. The fillable DAHP information request form is available on the CCC website: <http://cleancolumbia.org>

The disagreement on the compositing plan for the macroinvertebrate study was resolved when EPA agreed to composite samples randomly, as Teck American, Incorporated (TAI) had originally proposed. EPA included the caveat that a second study may need to be performed if the data suggest there may be accumulation of contaminants with organism age. All samples have now been analyzed and results should be available soon.

I reviewed the 2013 sediment toxicity split sample bioassay comparison memo. Both laboratories had very similar results for the samples tested. The main concern was determining the frequency of and correcting for "over seeding," that is when original

test containers were started with more than the specified number of test organisms. Over seeding is only noticed when the number of surviving test organisms is greater than the number of organisms with which the test was supposed to start. It is impossible to determine the survival rate in this instance and it casts some doubt on survival rate determinations for other tests.

Talks among EPA, the participating parties and TAI continue on the datasets and analysis approaches to be used for determining sediment toxicity. A meeting is scheduled in October to discuss the path forward. The sediment transport and sediment treatability studies remain on hold pending the determination of sediment toxicity in the UCR.

I reviewed the second draft of the upland soil split sample data summary memorandum. The draft addressed most of CCC's concerns. Clarification of the wording of section headings in Table 2 is still an issue.

I reviewed the draft and final data summary report for the 2016 sturgeon fillet study. No major issues were found with report. I proposed that the reduction in organic chemicals in fillets from cleaning and cooking be reduced from 50 percent to 25 percent due to the filleting and skin removal that occurred during sample collection. I believe the Washington State Department of Health fish advisory for sturgeon will incorporate this change. The good news is that a sturgeon fishery has opened up on Lake Roosevelt and the northern extent of the Columbia River as a result of the study. Visit the Washington State Department of Fish and Wildlife website for details on this new fishery:  
<https://fortress.wa.gov/dfw/erules/erules/erule.jsp?id=1975>

The informal dispute between TAI and EPA has been resolved. The dispute concerned the plant tissue study and the background soil level study. The resolution allowed the plant tissue study to move forward, focused on plants on the three tribal allotments being evaluated during the soil amendment study. TAI will prepare an assessment of background soil levels of metals and metalloids of concern. The resolution also specifies a delineation study be developed jointly with TAI and EPA. The delineation study will model the deposition of lead in the UCR site from the Trail smelter. This study will incorporate study data and air modeling.

I reviewed the draft soil amendment study plan. Several major issues included the small size of the proposed test plots, the proposed use of biosolids as a test amendment and the apparent lack of sufficient samples to perform all the proposed tests. In phone conversations following CCC's comments, it was conveyed that individual test plot size has been kept at 50 feet by 50 feet. Biosolids are available as Class A and Class B. Class A biosolids have eliminated 100 percent of pathogens. Class B biosolids have eliminated 90 percent of pathogens and mandate a 60-day wait period for people to enter the site after application. CCC strongly suggested the use of only Class A biosolids.

A revised and shortened set of tests was issued along with sample size requirements. The second draft of the plan was distributed with insufficient time to review before the comment due date. It has been CCC's experience that studies with a very short program development time tend to yield poor results. We hope this will not be the case with this study, as it is our hope that some amendments with elevated lead levels that do not trigger cleanup by TAI or EPA may be useable by property owners.

Joe Wichmann, PhD; CCC Technical Advisor

## **Want to be More Involved?**

CCC welcomes new members; you can join on our website ([www.cleancolumbia.org](http://www.cleancolumbia.org)). You can also find meeting minutes and links to other organizations involved in protecting the environment.

Our next General Member Meeting will be in the fall. We will post updated information on the website. Please join us.

We are currently looking for a new webmaster. This would involve maintaining our website and posting new information to it about once a month. If anyone out there is interesting in helping us with this, please contact Mindy Smith ([smithm69@msu.edu](mailto:smithm69@msu.edu)).

There has been a change to our EPA project managers. Laura Buelow is moving on to other projects and Monica Tonel, who is well known to us and very familiar with the project, came onboard in August. Her email address is [Tonel.Monica@epamail.epa.gov](mailto:Tonel.Monica@epamail.epa.gov) , Kathryn Cerise continues her work with the project ([Cerise.Kathryn@epa.gov](mailto:Cerise.Kathryn@epa.gov)). Concerns may also be directed to the acting EPA region 10 administrator Michelle Pirzadeh ([Pirzadeh.Michelle@epa.gov](mailto:Pirzadeh.Michelle@epa.gov)).

On behalf of CCC, I wish to thank Laura for her incredible work and dedication to the project. She was a tremendous asset and we wish her well in her future endeavors.

Mindy Smith, CCC secretary