The Kenmore Area Sediment Sampling and Analysis Plan

Responsiveness Summary
Public Comment Period October 15 – 29, 2012

Prepared by Washington Department of Ecology
with City of Kenmore, Washington Department of Health,
Dredge Material Management Program, and
US Army Corps of Engineers

November 29, 2012

Table of Content

INTRODUCTION

This Responsiveness Summary is for the Kenmore Area Sediment Sampling and Analysis Plan and Public Comment Period held October 15 – 29, 2012. The City of Kenmore (City) in partnership with the Washington State Department of Ecology (Ecology) developed a sampling and analysis plan. The plan is to guide characterization of sediment and water in the northeastern portion of Lake Washington south of Kenmore, near the mouth of the Sammamish River, and near shore the City of Lake Forest Park. The characterization has two purposes:

- Support the City's ongoing work with the U.S. Army Corps of Engineers (USACE) for dredge planning at the Kenmore Navigation Channel.

- Evaluate the possible presence of contamination along the near shore and shoreline including public access areas.

The plan titled, "Sampling and Analysis Plan for Kenmore Area Sediment and Water Characterization" was prepared by Anchor QEA and dated October 2012. The plan was developed with the City and Ecology in consultation with the Dredge Material Management Program (DMMP), the US Army Corps of Engineers (USACE), and Washington State Department of Health (WADOH).

Ecology conducted a public comment period for the draft plan (October 2012) from October 15 through 29, 2012. During this two week period, 15 comments were received. The comments were reviewed by the four agencies: Ecology, the City of Kenmore, DMMP with USACE, and WADOH. Each comment was carefully considered and where appropriate, was incorporated into the final Sampling and Analysis Plan for Kenmore Area Sediment and Water Characterization, and dated November 6, 2012. This Responsiveness Summary lists each comment and response by the four agencies.

The Responsiveness Summary is posted on the Ecology Webpage for Lakepointe aka Kenmore Industrial Park site at:

http://ecyapps4/gsp/SitePage.aspx?csid=2134

And at the Ecology Harbour Village Marina webpage at:

http://ecyapps4/gsp/SitePage.aspx?csid=9197

The comments are listing in the order they were received and numbered in the order received. The response is listed below each comment. The original comments with attachments are provided in Appendix A.

Comment #1 from Ann Hurst

From: Ann Hurst
Sent: Tuesday, October 16, 2012 12:03 PM
To: O'Brien, Maura (ecy); chingpi.wang@ecy.wa.gov; Warren, Bob (ECY); rkarlinsey@kenmorewa.gov; bhampson@ci.kenmore.wa.us; bhampson@kenmorewa.gov; david.r.kendall@usace.army.mil; Hardy, Joan (DOH); harbourvillage@frontier.com
Cc: c4sep; stedward; nlccannouncements@yahoogroups.com
Subject: Anchor Testing, why not Cal Portland?

Maura O'Brien, Kenmore Yard Site Manager, and Rob Karlinsey, Kenmore City Manager,
My apologies if I added to the confusion. I was mistaken; in 1996 sample S1 was in nearly same location as proposed SG4 by Anchor (I mis-read the 1996 map).

Why the Cal Portland area was not tested for contaminants in 1996 and will not be by Anchor in forthcoming tests, however, yet remains a mystery to the public. In the past and perhaps today because it is not being proposed for dredging? What about disturbing the sediments for a new dock? It was my understanding that Cal Portland will get a new dock, has a new dock? **Do I find the permits/E.I.S. or DNS on Cal Portland dock with City or Ecology?**

I have researched that a batch plant that uses fly ash may contribute significantly to Dioxins when filling the fly ash flue through faulty equipment (warning bells not activated, bags in disrepair, operator error) a repeated occurrence at this site over decades, how much is documented depends on complaints and self-reporting. I yet advocate testing the Cal Portland shore lands as it looks to me like the flue is close to the water and Cal Portland's tax info indeed says Cal Portland is on the water, though Cal Portland did self-report the latest, known incident.

Is the attached on Dioxin extraction new, useful in cutting costs, accurate?
All parties are moving in a good direction; I yet advocate that the turbidity at Harbour Village Marina, created by the WSDOT contractors tugs and barges as the contractors try to turn the barges 90 degrees, stop. Pretty easy to observe, pretty easy to fine, pretty awful for the residents who have repeatedly, daily been exposed to the turbid water and horrific if this exposure affects their even not yet conceived children.

Do you really think the barge contractors will self report their turbidity violations in the future if for the past months, since March, they have not done so -- even once -- and cannot make the turn without creating turbidity?

Best, Ann Hurst

Agencies Response to Comment #1

1A. SSAP testing at CalPortland.

Response – Ecology requested sediment sampling at or near the CalPortland waterfront. A new sediment sample has been added and is located at the northeast end of the Navigation Channel halfway between CalPortland and KIP site and labeled as sample SG-14.

1B. New Dock at CalPortland.

Response –City of Kenmore and USACE have not received an application from CalPortland or the landowner Fuyo Leasing for a new/improved dock.

1C. Batch Plant that uses fly ash may be a source or may contribute to dioxin.

Response –Technically fly ash could be a source or contribute to dioxin or other contamination. Cal-Portland Environmental Manager reports that the plant uses fly ash; it is delivered in sealed bags, transported in closed containment, and monitored following the PSAQA requirements.

1D. Dioxin testing using extraction.

Response – See earlier responses from laboratory and Kendall's responses.

1E. Turbidity at Harbour Village Marina (HVM) caused by Washington State Department of Transportation (WSDOT) and their contractor, Kiewit General Manson (KGM) use of tugs and barges may cause/is causing contamination to Kenmore citizens and children and area.

Response – SSAP includes turbidity testing at each water sampling location and you will find turbidity testing listed under Conventional testing in the SSAP. Also issues about turbidity and violation of Washington Clean Water Act have been referred to Ecology Water Quality Program (WQP). The WQP has conducted twelve inspections at the KGM operations at KIP site to date and no violation has been witnessed. WQP is working with WSDOT and KGM for best management practices and to minimize turbidity.

Comment #2 from Elizabeth Mooney

-----Original Message-----
From: Kendall, David R NWS [mailto:David.R.Kendall@usace.army.mil]
Sent: Thursday, October 18, 2012 11:28 AM
To: elizabeth.mooney
Cc: dbent@kenmorewa.gov; landerson@kenmorewa.gov; Barney, Phyllis (ATG); happyhaze@msn.com; aaronmsmithlaw@gmail.com; Cleve Steward; Radabaugh, David (ECY); dreitan@insleebest.com; O'Brien, Maura (ECY); Wang, Ching-Pi (ECY); Hardy, Joan (DOH); Ann Hurst; Aaron Smith
Subject: RE: UPDATE draft sampling plan (UNCLASSIFIED)

Hi Elizabeth: I have been out of office the last several days. Thank you for your observations and response. I want to stress that I do not know the PCB source for the Harbor Village Marina PCB/dioxin contamination, and would look to Ecology TCP to ultimately evaluate that question and concern.

I also have no doubt that you are observing suspension and redistribution of sediments in the area due to barge traffic in the navigation channel, and that some of these sediments may settle within the Harbor Village Marina.

My reasoning that there is another primary source of the PCBs is based on the ten-fold differences in PCB concentrations in the Harbor Village Marina and in the navigation channel. The PCB concentrations observed in the navigation channel material (detected Aroclor 1254, ranged from 15 - 27 ppb, averaging 21 ppb-dry weight, and TOC normalized concentrations ranged from 0.38 - 0.66 ppm-TOC, averaging 0.5 ppm-TOC) were well below (State Sediment Quality Standards(SQS), where they were quantitated at only 4.2% of the SQS (PCB SQS = 12 ppm-TOC. By comparison, the PCB concentrations in the Harbor Village Marina, ranged from a low of 196 ppb to a high of 277 ppb for Aroclor 1254, averaging 237 ppb, which are greater than ten times the PCB levels observed in the navigation channel based on the average concentrations. At least with the data in hand, it simply does not appear that there are enough PCBs in the navigation channel to have provided the level of contamination seen over time in the marina.

I think we will have to wait until the sediment investigation due to take place in early November provides the data to evaluate the PCB and dioxin concentrations throughout Kenmore. Hopefully that data will provide some answers. I know my interagency colleagues and I in the Dredged Material Management Program are anxious to gather the necessary data to evaluate the extent of the PCB/dioxin contamination at Kenmore, and are confident that the proposed testing strategy will be helpful to that end.

David

David R. Kendall, Ph.D.
Chief, Dredged Material Managment Office
Seattle District Corps of Engineers
Phone: 206/764-3768
email: david.r.kendall@usace.army.mil

-----Original Message-----
From: elizabeth.mooney]
Sent: Monday, October 15, 2012 1:08 PM
To: Kendall, David R NWS
Cc: dbent@kenmorewa.gov; landerson@kenmorewa.gov; phyllisb@atg.wa.gov; happyhaze@msn.com; aaronmsmithlaw@gmail.com; Cleve Steward; drad461@ecy.wa.gov; dreitan@insleebest.com; mobr461@ecy.wa.gov; cwan461@ecy.wa.gov; joan hardy; Ann Hurst; Aaron Smith
Subject: Re: UPDATE draft sampling plan (UNCLASSIFIED)

David,

I have read and reread your Oct 5 2012 email to Ann Hurst; unfortunatly, I disagree with your conclusion. I'd like to explain why by sharing my personal observation of tug/barge activity and subsequent brown sediment-laden water drifting into Harbour Village Marina, and ask if you believe you might reconsider your conclusion based on new information.

Before I do that, I want to thank you for correcting the record so we now know the type of PCB in both Harbour Village Marina and in the Federal Navigation Channel are the same, Aroclor 1254. I hope that Dept of Ecology reflects that in their website information. It is important that people understand these details and that they know that the PCB type in Harbour Village Marina is the SAME type as the PCB type in the Federal Navigation Channel. That is what is important, in my opinion. I appreciate your going to the trouble to correct the record in the email attached. It makes sense.

In your Oct 5 email to Ann Hurst, you state (and I added an underline and bold for emphasis for what I believe is most important):

My email clarifying error in letter (6/6/12):

Hi all: I would like to point out that in the fifth paragraph of Attachment 1 to response letter, it states that the Corps of Engineers "determined that the PCB fingerprints were significantly different at the two sites" (Federal navigation channel and Harbor Village Marina). I would like to correct the record that that statement is in error. The Fingerprinting indicates the Aroclor quantified at both sites was the same, Aroclor 1254, as noted in attached Figure. I wanted to correct the record, as there is a lot of misinformation out there regarding the testing at these two locations. Thanks.

David
David R. Kendall, Ph.D.
Chief, Dredged Material Management Office

The reason I (Elizabeth Mooney) disagree with your conclusion:
I have watched the barges numerous times in the navigation channel. I see them stop in front of Harbour VIllage Marina to turn their vessels. Most importantly, I've seen brown water in Harbour Village Marina AFTER the barges have departed Kenmore Navigation Channel, passed Harbour Village Marina and headed out into Lake Washington.

On the same day when Greg Wingard watched from the Hays' condo and noted a Clean Water Act violation in August 2012, I went, afterwards, to the HV Marina and talked to the Harbormaster Mike. Since that was the same day that Greg Wingard had noted the turbidity due to the tug/barge activity in the Kenmore Navigation Channel, I feel confident that what I was seeing at HVM was due to the barge activity. Additionally, the Harbormaster told me it was true. The Harbormaster told me to look out into the marina. I could easily see that brown water was in the Harbour Village Marina. Mike said that brown water enters HVM after the tug/barges pass the marina in the Navigation Channel. According to Mike, it happens all the time. Therefore, your conclusion in the email makes no logical sense to me. You stated that: "The concentrations of PCBs found in Harbor Village Marina were 10 times the concentrations found in the federal navigation channel in the 1996 characterization, and therefore, the navigation channel is not the likely source for the contamination in Harbour Village Marina." On the contrary, David, doesn't it make sense that if the barges have been churning up the bottom of the sediment in the Federal Navigation Channel, and if the wind or current drive the suspended sediment toward Harbour Village Marina, that the increase in concentrations of PCBs would build up in the Harbour Village Marina? From what I saw, I hypothesize that barge activity translocates the sediment, and that, subsequently, the sediment drifts into the marina where it can't go any further and settles onto the bottom. It builds up in the marina due to the barges churning up sediment in a Federal Navigation channel that has inadequate depth for the barges/tugs using it.

Based on my personal observation, when the barges churn up the sediment at the bottom of the too shallow Federal Navigation Channel with their too deep tugs' activities, the sediment appears to be churned up and the brown water (filled with the sediment) travels right into the Harbour Village Marina, due to wind or current or whatever. That is what I believe I saw happening.

Can you please help me understand? As you know, my goal is to protect our rights to having Clean Water. First we need to know where to test to get the answers we need. I am concerned about the method of testing. Perhaps, based on this information, there may be a reason to have Anchor QEA take a different type of sample to determine the extent/source of the dioxin and PCB at HVM. Since the Sediment Sampling draft went out today, I'd like to make sure you know about this brown water in HVM after tug/barge activity in the Navigation Channel.

Thanks very much,

Sincerely,
Elizabeth Mooney

From: "David R NWS Kendall" <David.R.Kendall@usace.army.mil>
To: "Ann Hurst" <annmhurst@msn.com>, "Elizabeth.Mooney" <elizabeth.mooney@comcast.net>
Cc: dbent@kenmorewa.gov, landerson@kenmorewa.gov, phyllisb@atg.wa.gov, happyhaze@msn.com, aaronmsmithlaw@gmail.com, "Cleve Steward" <cleve.steward@amec.com>, drad461@ecy.wa.gov, dreitan@insleebest.com, mobr461@ecy.wa.gov, cwan461@ecy.wa.gov, "joan hardy" <joan.hardy@doh.wa.gov>
Sent: Friday, October 5, 2012 10:40:51 AM
Subject: RE: UPDATE draft sampling plan (UNCLASSIFIED)

Hi Ann: I have to correct the statement below attributed to me in an earlier Ecology response letter to Representative Pollett. Ecology incorrectly quoted me relative to PCB fingerprinting of the Aroclors at

Harbor Village Marina and the Federal Navigation Channel. I have attached my email notifying Ecology (Maura O'Brien) of that error. The factual error was later corrected, but apparently the earlier uncorrected transmittal letter is still being circulated.
The concentrations of PCBs found in Harbour Village Marina were 10 times the concentrations found in the federal navigation channel in the 1996 characterization, and therefore, the navigation channel is not the likely source for the contamination in Harbour Village Marina.

David
David R. Kendall, Ph.D.
Chief, Dredged Material Managment Office
Seattle District Corps of Engineers
Phone: 206/764-3768
email: david.r.kendall@usace.army.mil

My email clarifying error in letter (6/6/12):

Hi all: I would like to point out that in the fifth paragraph of Attachment 1 to response letter, it states that the Corps of Engineers "determined that the PCB fingerprints were significantly different at the two sites" (Federal navigation channel and Harbour Village Marina). I would like to correct the record that that statement is in error. The Fingerprinting indicates the Aroclor quantified at both sites was the same, Aroclor 1254, as noted in attached Figure. I wanted to correct the record, as there is a lot of misinformation out there regarding the testing at these two locations. Thanks.

David
David R. Kendall, Ph.D.
Chief, Dredged Material Management Office
Seattle District Corps of Engineers
Phone: 206/764-3768
Fax: 206/764-6602
email: david.r.kendall@usace.army.mil

-----Original Message-----
From: Ann Hurst [mailto:annmhurst@msn.com]
Sent: Thursday, October 04, 2012 4:41 PM
To: Elizabeth.Mooney
Cc: dbent@kenmorewa.gov; landerson@kenmorewa.gov; phyllisb@atg.wa.gov; happyhaze@msn.com; aaronmsmithlaw@gmail.com; Steward, Cleve; drad461@ecy.wa.gov; dreitan@insleebest.com; mobr461@ecy.wa.gov; cwan461@ecy.wa.gov; Kendall, David R NWS; joan.hardy@doh.wa.gov
Subject: RE: UPDATE draft sampling plan

Elizabeth and All,
The 1996 sampling is attached, and yes, the channel where the docks reside was tested in 1996, with exceedances, but of the type that dissipate except for the relatively low PCB's. In an Ecology summary on line, Ecology states that Officer Kendall states, the type of PCB's found at Harbour Village Marina last year are not the same as found in 1996. What is off shore of CalPortland in 2012 will be unknown without testing that area, and now we know with equipment failures and use of fly ash over time at the

cement companies, the cement batch plants under various ownership and various controls of fly ash could be a cumulative source of the dioxins.
As I read the RCW, and with informal info from County, since the docking area is within City Boundary, it is clearly City Responsibility; County responsibility in past.

There was no Dioxin testing in 1996, and we now know that materials containing PCBs degrade over time, so what was in 1996 would not be a footprint of what is today as I, a lay person, understand various explanations made by various scientists to me. And if there are the 1996 PCB types at Harbour Village Marina, they may be well buried, watching recently all the churning of barges at that corner of the Kenmore Navigation Channel closest to Harbour Village Marina, which may have been going on for years with cement barge traffic, it is not a surprise that the Harbour Village Marina needs dredging.

An Ecology summary also said Officer Kendall made a comment on the types of toxins in the past at Harbour Village Marina, not certain where that material resides; but as I would prefer actual source material, I am again bothering Officer Kendall by cc'ing him and hoping he can clarify. Thank you Officer Kendall.

All in all, if we don't get a good testing pattern and firm execution date, etc., I am not going to be a good sport, Phyllis and Dawn, especially today with the high barge traffic, turbidity, and other likely infractions, waiting for official reports. Our health and it appears the workers' health is not being protected.
Best, Ann

Date: Thu, 4 Oct 2012 05:58:40 +0000
From: elizabeth.mooney@comcast.net
To: annmhurst@msn.com
CC: dbent@kenmorewa.gov; landerson@kenmorewa.gov; phyllisb@atg.wa.gov; happyhaze@msn.com; aaronmsmithlaw@gmail.com; cleve.steward@amec.com; drad461@ecy.wa.gov; dreitan@insleebest.com
Subject: Re: UPDATE draft sampling plan

Ann,

Isn't it the case that the water area (navigation channel) by Calportland/Lakepointe was tested in 1996? Why would anybody spend city money and Ecology's money to test if they aren't going to test there?

I left a message for our manager, Rob Karlinsey. It certainly was my understanding that city/Ecology money was to be spent looking for the source of the dioxins/PCB's. Would it make any sense to spend all that money on the Anchor QEA sampling if there is no sampling where they found PCBs in 1996? Am I forgetting something here?

Thanks.

Elizabeth

Agencies Response to Comment #2

2A. SSAP and source(s) of PCBs and dioxins.

Response – This sampling plan will be testing for PCBs and dioxin/furans at all sediment sampling locations listed in this SSAP in the Kenmore Area and Lake Forest Park. The source or sources for PCBs and dioxin are UNKNOWN. Historically, PCBs sampling has occurred numerous occasions at the KIP site and the results are no detection with one exception, a wood chip that was later dismissed as poor quality. Also PCBs were tested in the Kenmore Navigation Channel (SAIC 1996) and these results were no detection or below 27 ug/kg or parts per billion. At this time, the source(s) of PCBs and dioxin/furans are unknown, and this SSAP is the next step to investigate the extent and possible source(s) of PCBs and dioxin/furans in the Kenmore area.

Comment #3 from Ann Hurst

From: Ann Hurst
Sent: Wednesday, October 24, 2012 9:37 AM
To: O'Brien, Maura (ECY); Wang, Ching-Pi (ECY)
Cc: Barney, Phyllis (ATG); rkarlinsey@kenmorewa.gov
Subject: FW: [stedwards] Dioxin Levels Love Canal, Vietnam, No Kiewitt skin in game?

Maura,
I am in receipt of Anchor testing plan of Kenmore's shore lands; thank you. I am troubled that Kenmore's industries do not want their shore lands tested for Dioxin contamination. My comment is that you obtain a Court Order or whatever is necessary to test these shore lands using the most comprehensive testing methods available and require the industries pay for the testing. Ample justification is in email below, an answer that the public sought from me which I think is fair.
By now you must realize that the K/G/M barges did not stick to one barge per day! One barge per day was K/G/M's deal with WSDOT, in the FEIS, and I assume was K/G/M's deal with Ecology.
Thank you. Best, Ann Hurst, 6302 NE 151st Street, Kenmore, WA 98028

From: annmhurst@msn.com
To: c4sep@yahoogroups.com; stedward@lists.riseup.net; nlccannouncements@yahoogroups.com
Date: Wed, 24 Oct 2012 09:09:41 -0700
Subject: [stedwards] Dioxin Levels Love Canal, Vietnam, No Kiewitt skin in game?

To give you an idea of how 90 pptr in Kenmore sediments compares to the most egregious Vietnam contamination and Love Canal:

The U.S. will spend $68 million to clean up Vietnam dioxin hot spots due to leaching of Agent Orange from dioxin storage sites:

"The general standard in most countries is that **dioxin levels must not exceed 1,000 ppt (parts per trillion) TEQ (toxic equivalent) in soil and 100 ppt in sediments**. Levels beyond that require immediate remediation. Average dioxin contamination in the soil of industrialized nations is less than 12 ppt." At Harbour Village Marina, the Dioxin level of **90 pptr** in sediments should have triggered further investigation as the number is approaching the 100 ppt that requires immediate remediation. See source: http://www.aspeninstitute.org/policy-work/agent-orange/cleaning-dioxin-contaminated-soils

The 13.2 pptr in the sediments of the Kenmore Navigation Channel is not approaching 100 ppt but it is above the threshold of 10 ppt which requires during clean-up that it be treated as a hazardous substance and not allowed to disperse into Lake Washington. Clearly it has been allowed to disperse with barge traffic. The City of Kenmore, perhaps WSDOT, could seek damages from K/G/M.
By comparison, Love Canal had 380 pptr just in the fly ash. Fly ash is a product that in March wafted from the fly ash flue of Cal Portland in Kenmore; while it is unlikely that the recent source of fly ash used by Cal Portland is a by product of burning toxic wastes, prior fly ash sources could well have been a result of burning materials that would create a by-product with heavy dioxin contamination. Fly ash has been used at the batch plant for decades to create cement products.

Love Canal surface water sediments measured 37 ppb – perhaps someone can translate into pptr, the storm sewer sediment of Love Canal was 672 ppm, and six private sump pumps next to the industrial garbage dump measured as high as 16,500 ppm. A clear picture of the source, a dump.

Kenmore is not Love Canal, yet we are nearing the immediate remediation point at Harbour Village Marina and the source needs to be found and contained.

We are only one of four states that does not consider absorption of Dioxin through the skin to be hazardous in particular situations: "For dioxin, incidental ingestion is the dominant exposure route for unrestricted/ residential use, and four states (Delaware, Mississippi, Pennsylvania, and Washington) base their cleanup levels on this pathway alone. Most others incorporate inhalation and/or dermal exposures, but those contributions tend to be relatively small. However, under certain scenarios (such as for excavation workers), these additional exposure routes can contribute substantially to the derived cleanup level." P.19
REVIEW OF STATE SOIL CLEANUP LEVELS FOR DIOXIN, 2009

Agencies Response to Comment #3

3A. Need for more dioxin testing.

Response – The SSAP now includes 28 sediment and four water column samples. Given the City budget and Clean Sites Initiative funding from Ecology, this represents the maximum number of samples feasible at this time for this SSAP. In the future if more sampling is necessary, then additional funds will need to be secured and a new sampling plan will be written.

3B. Need PCB and dioxin/furan testing at Kenmore industrial sites.

Response – The SSAP locates several sediment samples at or near industrial sites in Kenmore. For example, seven sediment sampling locations are listed in the Kenmore Navigation Channel; five sediment samples are located off-shore Kenmore Industrial Park site; one sediment sample is located between KIP and CalPortland sites; one sediment sample is located off-shore Kenmore Air Harbor; in addition to sample locations at and near public parks and boat launch areas.

Comment #4 from Dennis Mendrey

From: Dennis mendrey
Sent: Wednesday, October 24, 2012 11:02 AM
To: O'Brien, Maura (ECY)
Subject: RE: Webpage and media information for Kenmore Industrial Park and Harbour Village Marina

Sound great!
Working together for a better Kenmore,
Dennis
RISE REALTY LLC
6410 NE 182 St
Kenmore, WA 98028
O = 206-686-8727
C = 425-681-8727
Fax = 206-686-8727
dennism@riserealtyllc.com
www.riserealtyllc.com

Agencies Response to Comment #4

4A. Praises the SSAP.

Response – Thank you for your encouragement.

Comment #5 from Washington State Department of Natural Resources

Comment # 5

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

RECEIVED
OCT 25 2012
DEPT OF ECOLOGY
TCP - NWRO

Caring for
your natural resources
... now and forever

October 22, 2012

Maura O'Brien, Toxics Cleanup Program NWRO
Washington State Department of Ecology
3190- 160th Ave SE
Bellevue, WA 98008

Re: Draft Sampling and Analysis Plan, Kenmore Sediment and Water Characterization

Dear Ms. O'Brien:

The Washington State Department of Natural Resources (DNR) would like to thank you for the opportunity to comment on the Draft Sampling and Analysis Plan for the Kenmore Sediment and Water Characterization.

DNR's comments are based on principles of stewardship and proprietary management derived from our legislative defined goals to protect State-Owned Aquatic Lands (SOAL) and preserve them for the public's benefit. We appreciate Ecology's consideration of these and any future comments related to the characterization of these sediments.

First, in Table 1, please note that DNR does not own state owned aquatic land-it is the manager of those lands.

Secondly, since the freshwater sediment standards are draft and are still being revised, they should not be the sole standards the nearshore samples should be screened against. (p. 27)

Sincerely,

Erika A Shaffer, MS
Aquatics Division, Sediment Specialist

AQUATIC RESOURCES DIVISION ▮ 1111 WASHINGTON ST SE ▮ MS 47027 ▮ OLYMPIA, WA 98504-7027
TEL (360) 902-1100 ▮ FAX (360) 902-1786 ▮ TTY (360) 902-1125 ▮ TRS 711 ▮ WWW.DNR.WA.GOV
EQUAL OPPORTUNITY EMPLOYER

Agencies Response to Comment #5

5A. Clarification Table 1 –Washington Department of Natural Resources (WDNR) does not own state aquatic land, it is the manager of those lands.

Response #5A – Clarification will be implemented on Table 1.

5B. Freshwater Sediment Standards are draft and are being revised and should not be the sole standards.

Response – The Ecology Freshwater Sediment Management Standards (SMS) are currently under revision. The SMS will be utilized when the SMS are final, and other available sediment quality guidelines will be utilized.

Comment #6 from North Lake Marina

Comment #6

North Lake Marina

6201 NE 175TH St, Kenmore, WA. 98028
P#425.482.9465 F# 425.482.9386
www.northlakemarina.com

October 25, 2012

City of Kenmore
Rob Karlinsey
Nancy Ousley
18120 68th Ave. NE
Kenmore, WA. 98028

Department of Ecology
Maura O'Brien
3190 160th Ave. SE
Bellevue, WA. 98008

Re: *Sampling and Analysis Plan Kenmore Area Sediment and Water Characterization*

Mr. Karlinsey, Ms. Ousley, and Ms. O'Brien,

We have reviewed the Sampling and Analysis Plan (the "Plan"). Please correct the Plan at page 3, second paragraph. The owner of North Lake Marina (Johnson & McLaughlin, LLC) is not participating in the Plan; rather, the property owners are the participating parties. It is our understanding Clifford Davidson has been working with the City, as a representative of Davidson Investment Properties, LLC, and Bernie Talmas, as Edwin Davidson's representative, spoke before the City Council at an open City Council meeting as to Mr. Davidson's intent to participate. North Lake Marina has agreed to facilitate any needed access and to provide moorage at no cost for the testing vessel. Please contact the undersigned if you have any questions concerning this letter.

Thank you,

Lori Johnson
North Lake Marina
Johnson & McLaughlin, LLC

Loren McLaughlin
North Lake Marina
Johnson & McLaughlin, LLC

Agencies Response to Comment #6

6. Clarification and correction.

Response –Clarification and correction will be implemented in SSAP.

Comment #7 from Greg Wingard for Kenmore Action Network (KAN)

Comment #7

Comments on the Sediment Sampling and Analysis Plan – Kenmore Area Sediment and Water Characterization

October 26, 2012

Prepared by:

Greg Wingard
PO Box 4051
Seattle, WA 98194-0051

Section 1.1

The Kenmore Navigation Channel (KNC) appears to terminate, adjacent to Kenmore Air. What is the status of the remaining portion of the head of the channel to the NE? Who owns it, and can it be sampled as well?

From our recent meeting, it is my understanding that the sediments at the head of the channel, northeast of and adjacent to the Kenmore Navigation Channel are in private ownership. Further, Ecology and/or the City of Kenmore have approached these property owners, including Kenmore Air, CalPortland, and Kenmore Industrial Park, who have declined to allow sampling of these in channel sediments as part of this SSAP project.

There is a high level of community concern about the potential contamination of the sediments in this area, and the head of the channel. This is based on available information such as present and former industrial uses, a fairly substantial fire involving creosoted timber, the sinking of a tug, which released at least some amount of product/waste (according to the United States Coast Guard), to list a few.

Sampling of these sediments is a high priority in the community, with a strong preference to see this sampling done sooner, rather than later. This concern is particularly critical due to the increased tug and barge traffic in this vicinity, which as been seen causing an increase in water turbidity, from the disturbance of channel sediment from prop wash.

While I understand there are some legal limits to what Ecology can do, or require a private property owner to do, I also want to be very clear that based on a reasonable assessment of the available information there is a strong community concern that sediments in the channel head, outside the KNC, may be contaminated, are being disturbed, and may be distributed as a result. Resolution of this data gap is a critical community issue that needs to be a high priority with Ecology, and Kenmore.

According to the plan this "screening level" study will be followed by a full DMMP characterization when the proposed funding for the project is two years or less out. There is some uncertainty in the proposed time lines here. Any information Ecology/Kenmore can provide on timing of further sampling after the initial screening is completed would be useful. My current understanding is that this is dependent to a large extent on federal funding/permission being available for the KNC dredge project. The assumed target date is currently thought to be between two and four years out, with substantial additional sediment data collection being done in that time frame.

The community requests that Ecology deal with this issue, of the time frame and potential scope of additional sampling concurrent with the release of data and reports resulting from this SSAP. By addressing this matter up front and as soon as possible Ecology/Kenmore can reassure the community of your commitment to collect the necessary data to see that community health and the environment of the north Lake Washington, and related near shore area is protected.

The document states the owners of Northlake Marina are interested in coordinating their dredging project, in conjunction with the KNC dredge to optimize potential cost savings. How does this fit in with the potential dredging at the Harbor Village Marina?

It would appear that given the somewhat closely coordinated approach and timing of the dredging at each of these three sites, that particular attention should be paid to the potential for any nexus between the sites. The current sampling design does not appear to meet this objective, as there appear to be remaining data gaps in the area east of the Harbor Village Marina, north and west of the KNC, and at the head of the channel north and east of the KNC.

My understanding is that Ecology/Kenmore are investigating the possibility of moving some sampling locations to address this issue to some extent, but that there is a lack of additional funds to allow for more sampling locations to be added.

The community requests that Ecology meet with the community as soon as possible after the data from this SSAP is released to discuss a data gaps analysis, including an assessment of what the additional priorities for sampling will be, and timing of further sampling efforts.

A substantial amount of both public and private funds will be expended in dredging, or corrective actions for the identified dredge project, or known contaminated site areas. The understanding of the potential contamination nexus between these proposed project areas, as well as additional nearby areas needs to be understood, and the potential for recontamination known and addressed prior to dredging or removal actions.

Section 1.2

The exact purpose of the water sampling is not clear. The primary chemicals of concern from the community perspective are the dioxin/furan/PCB's, and metals, in particular at Log Boom Park, as the park is closely adjacent to the known dioxin/furan/PCB contamination at the Harbor Village Marina. It is highly unlikely that these particular chemicals of concern would be found dissolved in the water column. The more likely scenario is that the water column would be contaminated by sediment stirred up by human, or mechanical activity. To the extent there is a risk to public health from the water column absent disturbed, suspended sediments, based on available data to date, it is much more likely that health risk would relate to biological constituents (pathogens), rather than chemicals of concern, such as dioxin/furans/PCB's and metals.

It does not appear that the water quality samples add much value to this sampling effort. If the expense related to the proposed water quality sampling is equal to, or greater than the cost of an additional sediment sample (my understanding is that the loaded cost of adding another sediment sampling location is ~$2,200), then Ecology/Kenmore should strongly consider scrapping the water quality sampling and instead adding an additional sediment sample(s), in one of the available areas where more data would be useful. A potential priority would be the area to the east of the current Harbor Village Marina samples.

Section 1.2 (sic)

There are clearly multiple purposes related to this sampling effort. In terms of sampling collection methods and analysis, these should be as homogenous as possible between all sampling locations, so as to maximize the potential statistical and comparative use of the data across the entire area sampled. It is not clear from this section how Ecology/Kenmore are going to optimize the statistical , and comparative usefulness of the sampling data. It is understood that there are some cost concerns/limitations that may impact aspects of this issue.

There is a reference to the revision of the Ecology sediment evaluation framework for freshwater, and that revision being available when published. The relevance to this SSAP is not clear. It is my understanding that the revised framework may be available in final form by the time the data from the SSAP project is available. If that is the case the consultant will use this updated document to screen the results against. The SSAP text of this will be clarified.

Section 1.3.1

Given the information about existing industries on, or in close proximity to the channel, the upper head of the channel, northeast of the KNC should be sampled as well. As this is discussed above, I will not repeat that information here.

Section 1.3.3

In the discussion of sediment loading the SSAP, provides specific citations related to sediment loading from stream 0056. In the discussion of the Sammamish River sediment loading and wind and wave transport, there are no citations provided, just a general assumption that the river is one of two primary contributory sources. Is there an available data on potential sediment loading from the River, or its sediment distribution?

It is understood that the current priority is to get the sampling underway. As a result, additional information of Sammamish River sediment loading to Lake Washington may wait until the data evaluation phase, rather than being included in the SSAP now. There is general agreement that additional information on Sammamish River sediment loading to Lake Washington will be useful.

In Ecology's recent update, "Harbour Village Marina", the site status and previous data are reported. This information is not referenced in section 1.3.3., of the SSAP.

In short the marina was already on Ecology's MTCA site list due to petroleum contamination, including soil and groundwater. The facility previously decided to deal with this site contamination through "natural attenuation." It has since been determined this petroleum contamination originated at an adjacent site, and Ecology's files are being updated to reflect this.

At the time the petroleum contamination was evaluated, data related to nearby dioxin/furan/PCB contamination was not known. There is potential concern that since petroleum at excessive levels has been located in the shallow groundwater at this facility, there may be a potential for the petroleum to impact nearby sediments. This is of concern as petroleum, in particular the lighter fractions of petroleum has the potential of mobilizing dioxin in soil, sediment, and water. Further consideration of this potential media/contamination nexus should be a high priority.

As mentioned above, given the historic information supplied in this report, and otherwise known about the CalPortland area, and the area outside of the KNC, referred to as the head of the channel, lack of samples from this area is a clear data gap. While it is understood that this area is private property, and neither Ecology or Kenmore have the immediate ability to collect samples on private property without property owner cooperation, plugging this data gap remains a top community priority.

Table 1

The table provides detail and rationale for selected sample locations. Near shore sediment samples are described as having a collection depth of 10 cm, and are collected with a trowel. Grab/box core samples are described as having a collection

depth of 25 cm. The difference in sample depth adds a variable that interferes with the ability to compare results from these two groups of samples. Sediment sample depths should be as consistent as possible across this sampling effort. From our recent meeting the issue of cost was raised as part of the rationale for differing sample depths, though how much impact having uniform sampling depth would have on the budget was not discussed in any detail.

As per previous comment, it is not clear what value the water sampling has in the context of this limited sampling plan, or how single point in time water samples would be that useful in terms of a health assessment given time loaded variability of water samples as compared to sediment samples.

Water analysis should include turbidity, as there is a specific water quality criteria for that parameter. From the meeting, it was clarified that turbidity sampling will be done as part of the conventional parameters taken at all the sample sites. The text will be modified so this information is consistent with the field sample forms at the end of the SSAP.

Figure 2

As mentioned previously given the proximity, and/or planned coordination between the three planned dredging, or cleanup projects (it is not clear whether Harbor Village Marina will proceed as a MTCA cleanup, or as a dredging project), the potential for a nexus between these three areas, the Harbor Village Marina, North Lake Marina, and KNC should be a priority of this and future sampling efforts. The sediment sampling as proposed does not address better defining the eastward lateral extent of sediment contamination from the presently known dioxin/furan/PCB contamination at the Harbor Village Marina. It does not address the potential for a nexus between that contamination and the eastward elbow of the KNC where current tug, and barge operations are at least in part making a turn and have been observed causing excessive turbidity in the water column. It also does not address the undesignated section of the channel between the northeastern extent of the DNC and the channel head, where according to the historic information supplied, some of the most likely potential sediment contaminant sources are, or were located. Ecology/Kenmore will investigate moving some of the sampling locations to address this issue, as long as that doesn't interfere too much with other data quality objectives.

Ecology mentioned in our recent meeting that the City of Lake Forest Park is siting a sediment sample in their area in addition to what was initially planned by Ecology and Kenmore. It is not clear if this sample is depicted in Figure 2.

Section 3.4

The section refers to the three planned water samples and says a single "background" sample will be collected upstream of the 68th Avenue bridge on the Sammamish River. How does this location constitute "background", as compared to Log Boom Park. Wouldn't it be preferable to take a water sample from the central part of north Lake Washington, and use that as background?

It seems the differences in the total volume of water, potential for inputs and other factors would make an upstream Sammamish River sample less than satisfactory for this purpose, and a sample from the middle of north Lake Washington would be more representative.

Ecology agreed to examine moving the "background" water quality sample, and will respond to this concern.

Section 3.4.1

The difference between grabbing a core sample and the trowel method of sampling has the potential to introduce an unnecessary variable in the sediment sampling methods. This includes a variable in the portion of sample based on depth for the trowel method, as compared to coring which would better isolate the sampled sediment and collect a more representative sample on the vertical axis to the depth sampled. Ecology agreed it is important to strictly control the sample collection to assure a representative sample is collected, and a sample collection call-out will be added to address this issue.

The rationale for the difference in sample depths is not clear. There should be some clear, consistent rationale for the sampling depth, such as the depth of contamination as seen at the Harbor Village Marina, or the depth of the biologically active zone, or the depth of planned dredging, or the depth likely to be disturbed by human contact or mechanical means. There should be at least some brief explanation of why there is a difference in sediment sampling depths.

Section 5

What is the rational for the difference in TBT sampling methodology between the near shore, and surface sediment samples?

In the KNC samples, and the Harbor Village Marina samples the TBT sample will be collected in the lab from the sample pore volume water, with bulk TBT sample analysis if enough pore water volume is not present in the sample. The rest of the collected samples will have bulk TBT sampling, apparently irrespective of whether there is enough pore water volume, or not. There should be at least a brief explanation for this variance in the sampling methodology.

Table 7

The schedule is of concern. As laid out in the schedule there will be a fairly long period of time between sample collection, and the issuance of the looked for reports from Ecology and Department of Health. It is understood that it is Ecology and Kenmore's intent to issue the data to the public as soon as the Quality Assurance/Quality Control step is completed. It is understood that this will be relatively "raw" data, without detailed explanations or conclusions, which will come later when the final reports are issued.

References

Under the Ecology citations, there is no reference to the Ecology sediment evaluation framework for freshwater. Does this mean Anchor is not using this as a reference in this SSAP?

The SSAP text will be modified to clarify under what circumstances the new framework will, or will not be used.

There is a reference of a personal communication between J. LaFlam and Bill Joyce in 2012. What is the substance of this communication and the significance of citing to it in the SSAP?

It is understood from the recent meeting that the J. LaFlam citation was a reference to a discussion between Kenmore staff, and the Kenmore Fire Department to collect additional information on the previous wharf fire of creosote treated timber, in the vicinity of the current CalPortland facility. Given the available information on this creosote timber fire, and the verification that at least a portion of the burnt and partially burnt treated timbers are still in the water and sediment in the channel adjacent to CalPortland, Ecology should likely add this site to the known and suspected contaminated sites list under MTCA authority. KAN will be discussing this in the near future, and may provide some additional input on this point.

Agencies Response to Comment #7

Note, each paragraph represents a specific comment and is listed as A, B, C…
7A. Ownership status of NE portion of Navigation Channel (KNC).

Response – NE portion of the Navigation Channel is under private ownership by Pioneer Towing Company, Inc. and two sediment samples have been located in the northeast portion of the Channel, see sample #SG-04 and SG-14, in addition to the five samples in the central and western portion of the Channel.

7B. Potential sources of contamination may be located at NE portion of Navigation Channel and there is high community concern to request sediment sampling at the Channel.

Response –See Response 7A.

7C. Increased water turbidity and tug traffic at Navigation Channel may be causing potential contamination and re-distribution of contaminated sediment.

Response – see Response 1E above.

7D. Kenmore Navigation Channel sediments represent a critical data gap.

Response –see Response 7A above.

7E. Further sampling and full DMMP Dredge Application at Kenmore Navigation Channel (KNC).

Response – Sampling and investigation are conducted on a step by step basis. Further sampling and investigation will be based on these SSAP results. Future dredge applications for the KNC, Harbour Village Marina, or North Lake Marina will be determined by each party based on their priorities, budget, and selection.

7F. Future sampling and release of SSAP data results after QA/QC.

Response – City and Ecology agreed that the SSAP results will be made available as soon as the laboratory and Anchor QEA complete their data quality evaluation called QA/QC to confirm the sample results are valid and representative. Sampling results after QA/QC will be posted on the City and Ecology WebPages. The SSAP-QA/QC results are estimated to be posted in mid-January 2013. An informational meeting for the SSAP results will be scheduled. The SSAP report by Ecology will be available estimated March 2013 and the WDOH Health Consultations will be available in spring 2013.

Any need for future sediment sampling will be based on these results, and for a future DMMP Dredge application will be determined by respective party, and see Response to 7E.

7G. Proposed dredging applications for KNC, North Lake Shores and Harbour Village Marina (HVM) .

Response – Proposed dredging applications will be determined by each party based on their priorities, budgets, and selection. Coordination is encouraged between and among all parties.

7H. Nexus between or among dredging projects and need for coordination.

Response – This SSAP is one step, a screening step to estimate the near shore sediment and water column conditions. Further testing may be necessary based on these results. Future sampling will be required for each specific dredge application and will be determined by each party.

7I. Community request for Ecology to meet after SSAP testing results are available.

Response – Ecology will participate in an informational meeting and discussion for the SSAP results, and see Response 7F above.

7J. Need for coordination for planning, implementation, safeguards and source control for both dredging and Ecology environmental functions at these waterfront locations.

Response –Yes this is true and City and/or Ecology will work with appropriate parties as each or several of these tasks are planned.

7K. Need to clarify the purposes for surface water column sampling and why/why not specific analysis such as biological constituents (pathogens) are/are not part of the SSAP.

Response – King County Department of Public Health conducts water quality evaluation for public health including biological constituents and pathogens. This SSAP is for the purposes of dredge planning and Ecology's environmental evaluation and the Model Toxics Control Act (MTCA) cleanup requirements. Surface water column samples will give us a snap shot view of water quality at the time of sediment sampling.

7L. Question –change water column samples for additional sediment sampling.

Response – The four agencies reviewed this request and determined that the water column results will provide valuable information. Ecology and WADOH will use the water column results in their respective evaluations and proposed report and Health Consultations.

7M. Need to specify sampling methods as precise as feasible, and prepare for statistical and comparative analyses of results.

Response – Request implemented.

7N. Clarify Fresh Water Sediment Management Standards and Screening Criteria.
Response – Request implemented. The fresh water Sediment Management Standards are currently under revision and once they are approved (estimated 2013), then they will be used in the SSAP report, and see Response 5B.

7N-2. Need for additional sediment sampling for variety of industries and northeast KNC.

Response – Sample locations have been reviewed and modified to achieve best lateral extent and achieve specific site information, for example the relocation of samples SG-14, SG-15 and WS-10. This SSAP was expanded to 28 sediment and 4 water samples. Any need for future sampling will be based on these results, and or dredge application, and see Responses 3A and 3B.

7O. Need references for sediment loading for creek 0056 and Sammamish River.

Response – Add citation "Kenmore Lake Line Lakebed Sedimentation Analysis Report" for the north Lake Washington Kenmore Area prepared by SoundEarth Strategies and Lally Consulting dated October 6, 2011. Anchor, Ecology and others will provide additional sources of information as available. And we concur that additional information on sediment loading to Lake Washington will be useful and will be incorporated in the SSAP report.

7P. Need to add information at section 1.3.3 to the SSAP.

Response – Request implemented.

7P-2. Issues of Harbour Village Marina and neighboring site with former petroleum underground storage tank removal and soil and groundwater petroleum exceedance, and the questions of possible petroleum causing contaminant migration especially with nearby PCBs and dioxin/furan in sediment.

Response – Ecology will follow up with HVM and neighboring property for the petroleum issue and possible mobility of sediment contamination.

7Q. Need for additional sediment sampling at northeast KNC and private properties, such as CalPortland and Kenmore Industrial Park sites, and suggests to plug this/these data gap(s).

Response – See Responses 1A, 3A and 3B, and 7N-2 above.

7R. Sediment sampling methods and how best to make all results comparative and minimize variability.

Response – Request implemented. Note, there are two sediment sampling methods. One method is for dredge planning and uses 25 cm depth. The second method is for environmental and health evaluation and uses 10 cm depth to evaluate the active biotic zone. All sampling will be conducted consistent with professional standards and protocol and to be representative of each depth interval.

7R-2. Question about water sampling and analysis within this limited sampling plan.

Response – See Response 7L above.

7S. Water analysis should include turbidity.

Response – Note the SSAP includes conventional parameters (field parameters) including turbidity monitoring at each sample location. Revise SSAP to clarify turbidity monitoring will be conducted at water sampling locations.

7T. Need to coordinate among the three potential dredge locations (KNC, HVM, North Lake Marina) for planning and implementation for dredging and/or Ecology environmental tasks.

Response – The SSAP results will assist in defining the next steps both for planning for dredging and/or environmental and health tasks. Any future proposed dredge applications for KNC, Harbour Village Marina, or North Lake Marina will be determined by each party based on their priorities, budget, and

selection. Yes, parties have been working together and will be encouraged to continue working together. Also see response 7Q above to address possible data gaps.

7U. City of Lake Forest Park has requested sediment sampling at the City's public waterfront park.

Response - Two new sediment samples are proposed by the City of Lake Forest Park (LFP) near off-shore at Lyon Creek Park, approximately 2400 ft west of Log Boom Park. The water column background sample has been relocated by the City and Ecology from Sammamish River to off-shore at northeast Lake Washington. The two sediment sampling costs are to be covered by LFP City. City of Kenmore, Ecology and Lake Forest Park are working together. SSAP text and figure 2 are revised.

7U-2. Question is to relocate background water column sample from Sammamish River to a location at northeast Lake Washington.

Response – Request implemented and see SSAP revised figure 2.

7V. Sediment sampling methods, depths, and consistency of sample collection for vertical axis, and see SSAP section 3.4.1.

Response – Request implemented, and see Response 7R above.

7W. Tributyltin (TBT) sampling methodology, using TBT pore water or bulk sample, and see section 5.

Response – Request implemented.

7X. Schedule for SSAP sample results, QA/QC results, and reporting.

Response – The SSAP on Table 7 lists the estimated dates for sample results, QA/QC results, and reporting. Ecology has posted this estimated schedule on the KIP and HVM webpages. The estimated schedule is:

-November 6, 7 and 8, 2012 sample collection.
-Mid-December 2012 estimated laboratory SSAP results.
-Mid-January 2013 estimated QA/QC completed for SSAP results and posted on the City and Ecology WebPages and available to the public.
-An informal meeting to discuss the SSAP results will be organized if requested.
-Mid-February 2013 for Anchor QEA Sampling and Analysis Results Memorandum.
-Mid-March for the Ecology SSAP report.
-Spring 2013 for the DOH Health Consultations.

7Y. References and Ecology Revised Sediment Management Standards.

Response – Request implemented and see response 5B above.

7Z. Clarify reference to J. LaFlam, Kenmore Fire Department.

Response – City will provide information to clarify and describe reference.

Comment #8 from Gary Sergeant via Floyd Snider

Comment #8

O'Brien, Maura (ECY)

From: Kate Snider [Kate.Snider@floydsnider.com]
Sent: Monday, October 29, 2012 1:50 PM
To: O'Brien, Maura (ECY)
Cc: Wang, Ching-Pi (ECY); Gary Sergeant
Subject: Public comment on Sediment Sampling & Analysis Plan for Kenmore Area Sediment

Maura,

The following comments on the Sediment Sampling & Analysis Plan for Kenmore Area Sediment are provided on behalf of Gary Sergeant and Pioneer Towing, Inc.

1. Section 1.3.3, paragraph 5, page 9: Ecology's recent Public Participation Plan (PPP) update includes a description of the KIP site history that is more accurate than this description presented in the SAP. We would appreciate substitution of your text from the PPP. Most importantly, the 6th sentence regarding reported disposal of medical wastes and transformers should be deleted, as it is an old conjecture which has since been disproven.

2. Table 1: Our understanding is that sediment samples SG-14, SG-15, SG-16 and SG-17 will be on DNR aquatic lands property, offshore of KIP. Please confirm.

3. Figure 2 and Table 1: Throughout the year, significant sediment loads are conveyed out of the Sammamish River, and are deposited throughout the north end of Lake Washington. We are surprised that the proposed sampling plan does not include samples within the depositional area of the mouth of the Sammamish River, that would analyze this material as a potential source of contamination to the area. We recommend that approximately 2 sediment grab sample locations be added at (or relocated to) the centerline of the Sammamish River Small Boat Navigation Channel, south of SG-15 and in-between SG-16 and SG-17. In addition to the proposed SG-01, these sample locations could be used to characterize Sammamish River bed load as a potential source.

Please let Gary or I know if you have any questions.

Thanks,

Kate

Kate Snider, PE Principal
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From: O'Brien, Maura (ECY) [mailto:MOBR461@ECY.WA.GOV]
Sent: Monday, October 15, 2012 12:51 PM
To: Gary Sergeant; Kate Snider; Lakey, Kevin
Cc: Wang, Ching-Pi (ECY)
Subject: FW: Webpage and media information for the Sediment Sampling and Analysis Plan for the Kenmore waterfront area.

Hello,
Here is the Kenmore Area announcement and plan. The SSAP is posted both on the Ecology's Harbour Village Marina webpage and on the Kenmore Industrial Park site webpage.

Maura

SEDIMENT SAMPLING & ANALYSIS PLAN COMMENT PERIOD Kenmore Area Sediment & Water Characterization – Oct 15-29, 2012

Ecology is holding a two week informal public comment period for the citizens of the Kenmore Area for the proposed Sediment Sampling and Analysis Plan at the Kenmore waterfront area. The Washington Department of Ecology with the full cooperation of the City of Kenmore are working in close consultation with the Washington State Department of Health (DOH) and Dredged Materials Management Program (DMMP) on the details for the Sediment Sampling and Analysis Plan (SSAP). The SSAP will include near shoreline sediment sampling at Log Boom Park, Lake Washington northeast waterfront, Harbour Village Marina, North Lake Marina, offshore of the Kenmore

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Industrial Park site, Kenmore Navigation Channel and Sammamish River, and water column samples at Log Boom Park. Final access arrangements have been completed.

The draft SSAP will be available for informal public review from October 15 – 29, 2012. This is not a formal state cleanup requirement (Model Toxics Control Act) for public involvement. Your review and comments are requested and please send written or email comments to Maura O'Brien at mobr461@ecy.wa.gov or Department of Ecology, 3190 – 160th Ave SE, Bellevue, WA 98008. Ecology, the City, DOH, and DMMP will review all comments received and finalize the SSAP.

SAMPLING SCHEDULE
Sampling is scheduled for early November, preliminary sediment and water column sampling results are estimated to be received in December, and a draft report with these results are estimated to be available in January 2013. This schedule is subject to change due to unforeseen circumstances, such as equipment availability and weather conditions.

Maura S. O'Brien, PG/HG #869
Professional Geologist/Hydrogeologist
Toxics Cleanup Program - NWRO
Department of Ecology
3190 - 160th Avenue SE
Bellevue, WA 98008-5452
Tele 425-649-7249
Fax 425-649-7098
Email mobr461@ecy.wa.gov

Agencies Response to Comment #8

8A. Background description.

Response – Ecology revised the SSAP background description.

8B. The proposed four sampling locations offshore of KIP site.

Response – The three KIP sediment sample locations are located off-shore at DNR aquatic lands and outside of private property. Note sample location symbol distorts specific location on figure. Two sediment sample locations are located within the Navigation Channel with access agreement with the owner, Pioneer Towing Company, Inc. and see revised sample location figure, SSAP Figure 2.

8C. Proposed sediment sample locations at the Sammamish River mouth to characterize river bed load as a potential source.

Response – Sediment samples SG-01 and SG-16 are estimated to represent the Sammamish River bed load.

Comment #9 from Greg Wingard for Kenmore Action Network (KAN)

On 10/29/12 2:57 PM, Greg Wingard wrote:
Maura:

My initial hope for the sampling approach was that at least the additional sampling in the Harbor Village Marina area would be consistent with the data group from the previous sampling there. I understand what that would do to the sampling budget.

Failing that, that the sample data collected as part of this SSAP project would be consistent enough across the sediment data set to allow for easy data comparison and statistical assessment of the data.

Even the deeper cores from the sediment data are fairly shallow in depth, under a foot (ten inches). The trowel samples at 10 cm, only close to four inches. Since these samples are essentially single composite samples per sample location, the difference in depth, and the very shallow nature of the near shore sediment sampling is troubling. Under four inches may not even accurately describe the depth which is likely to be disturbed in the near shore areas by human and mechanical activity, as my understanding is that much of this sediment is very soft muck.

As we discussed, it is my belief that it is important that we get additional data as soon as possible. There will also be some future data collection to address some of the shortfalls of this data set, including deeper samples at least in some locations (primarily associated with the dredging).

I tried to balance these concerns, benefits and short comings in my comments, but as you can tell remain concerned about the shallow nature of the samples, and the lack of identical sampling parameters between all sediment samples collected.

How much additional cost is involved in making all the samples 25cm? As the entire vertical profile, irrespective of depth is in essence a single composite per sample location, at the additional 15cm of vertical sampled sediment is not that much additional volume, it doesn't seem to me like there should be that much additional cost to simply collect 25cm of sample, across all sediment sampling locations.

Regards,
Greg

Agencies Response to Comment #9

9. Recommend all sediment samples to be 25 cm in depth to make sampling and results consistent and comparable.

Response – Anchor QEA and four agencies reviewed this request and determined that the revised SSAP best accomplishes the sampling screening level characterization as specified in this SSAP. The SSAP has two purposes- one for dredge planning, and the second for environmental and health assessment. The deeper samples (25 cm) are for dredge planning and the shallower samples (10 cm) are to characterize the biotic zone for environmental and health assessment.

Comment #10 from City of Lake Forest Park

Comment #10

Mayor
Mary Jane Goss

17425 Ballinger Way NE
Lake Forest Park, WA 98155-5556
Telephone: 206-368-5440
Fax: 206-364-6521
E-mail: cityhall@ci.lake-forest-park.wa.us
www.cityoflfp.com

CITY OF LAKE FOREST PARK
INCORPORATED 1961

10/25/2012

Ms. Maura O'Brien
Department of Ecology
3190 160th Ave NE
Bellevue, WA 98008

Dear Ms. O'Brien,

Thank you for meeting with City staff to discuss the Kenmore waterfront area sediment sampling and analysis plan (SSAP). As you know, the presence of chemicals and potential presence of contamination in Lake Washington sediments is an issue of serious concern for the City of Lake Forest Park.

The proposed SSAP does not provide for sampling in Lake Forest Park despite the close proximity (~2400') of the Lake Forest Park Waterfront Park and the Civic Club to the proposed sampling area. Each of these facilities provides access to Lake Washington while the Civic Club has a popular swimming area. There are also 29 residences on the lake between Log Boom Park and Waterfront Park.

We understand that the rationale for not sampling in Lake Forest Park is based on the Kenmore Lake Line Lakebed Sedimentation Analysis study that indicates the migration of sediment is predominately to the northeast. If this were true, sediment on the Lake Forest Park waterfront would travel toward Kenmore. Unfortunately, this has not been our experience. In fact, seasonal changes in sediment migration have been observed with sediment migrating, at times, in the southwest direction taking sediment from the Kenmore waterfront area into Lake Forest Park.

As a result, the City respectfully requests that a sediment grab sample and a water sample be taken between the Lake Forest Park Waterfront Park and the Civic Club as part of the Kenmore Waterfront area SSAP. See the attached map to better understand the area. Please contact Aaron Halverson, Environmental Programs Manager at (206) 957-2836 or ahalverson@ci.lake-forest-park.wa.us if you have comments or questions.

Sincerely,

Mary Jane Goss

Mary Jane Goss
Mayor


Lake Forest Park Sampling Map
King County

Agencies Response to Comment #10

10. Request by Lake Forest Park City (LFP) is to add one sediment and one water column sample near shore at the public park and later modified to add two sediment samples and no water sample; and LFP to cover sampling costs.

Response – Request implemented. Note, LFP later modified the request for two sediment samples. City of Kenmore and Ecology relocated the water column background sample to off-shore northeast Lake Washington near Lake Forest Park and Log Boom Park.

Comment #11 from Elizabeth Mooney

From: elizabeth.mooney
Sent: Monday, October 29, 2012 7:55 PM
To: O'Brien, Maura (ECY)
Cc: Elizabeth Mooney; Janet and Bob Hays; Ann Hurst
Subject: Sediment and Water Sampling Plan Kenmore: ERTS Information 632786 (UNCLASSIFIED)

October 28, 2012

Maura O'Brien
Dept of Ecology
Comment regarding Sediment and Water Analysis Kenmore:

Dear Maura,
I am sending this email chain as evidence in support of my argument that the truth was not upheld, nor our laws abided by, nor our agencies able to support my ERTS call by enforcing the water quality laws that are supposed to protect our public right to Clean Water. The record was never corrected. I have called Coast Guard, WSDOT, DOE regarding this email.

The point is that the barging operation for SR 520 continues, the companies do the work, the waters and sediment have not been tested and the barge grounding and contaminated water (turbidity) was never admitted to have occurred.

I believe this in evidence that the project has not been abiding by the laws intended to protect our environment. Calportland is part of the team and is not allowing DOE to test the sediment in front of their property at the bottom of the lake. Why wouldn't they? We do not know the source of the dioxins that were found in high levels at Harbour Village Marina in October 2011. Since this behavior of denying a grounding occurred when in fact it did is an indicator that the companies and WSDOT and the contractors were not admitting to a grounding when in fact it occured, how can we trust without DOE testing that this is not the source of the high level of dioxins? There is a wharf that burned and that is in the lake. Burning wharfs might be a source of dioxins. This is good reason to have Calportland, to let their area be tested before it has more barges push in and out of the head of the channel.

I have seen the turbidity caused by the incident Greg Wingard observed flow (brown water) into Harbour Village Marina. I stood at Harbour Village Marina and talked to its harbormaster Mike, while watching the brown water in the marina as it contrasted with the blue water further out in the lake.

I can only assume that the barging that has been ongoing may have contributed to translocation of sediments. If you or WDFW need proof, the agencies would have had to test first, measured, and had a baseline from which to compare.

I hope the Calportland site will offer to let DOE test, but, regardless, I would hope one day to receive a letter that states that this email was in error. I have heard that WSDOT admitted they grounded during the ERTS 632786 incident, but I haven't seen a letter to correct this email message.

Elizabeth Mooney

From: "David R NWS Kendall" <David.R.Kendall@usace.army.mil>
To: "Elizabeth Mooney" <elizabeth.mooney@comcast.net>
Cc: "Clay Keown (ECY)" <ckeo461@ECY.WA.GOV>
Sent: Thursday, March 29, 2012 3:13:20 PM
Subject: RE: ERTS Information 632786 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Elizabeth: FYI, I got this email communication from John Hicks (Chief/Navigation), regarding tug movements/turbidity in Kenmore Channel. The Tugboat operator's email (see email string below) to USCG discusses their activity and indicates that there were no groundings.

I have no interest in getting in the middle of this, but wanted to let you know that the USCG investigated the complaints about the turbidity.

David
David R. Kendall, Ph.D.
Chief, Dredged Material Management Office
Seattle District Corps of Engineers
Phone: 206/764-3768
Fax: 206/764-6602
email: david.r.kendall@usace.army.mil

- FYI-see below

_____

John A. Hicks
Chief, Navigation Section
Army Corps of Engineers, Seattle District
4735 E. Marginal Way S
Seattle, WA 98124-2255
(206) 764-6908- Telephone
(206) 595-2750- Cell
(206) 764-3308- Fax
john.a.hicks@usace.army.mil

-----Original Message-----
From: Heather.J.St.Pierre@uscg.mil [mailto:Heather.J.St.Pierre@uscg.mil]
Sent: Monday, March 26, 2012 11:23 AM
To: Hicks, John A NWS
Subject: FW: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Hi John,
I've attached the e-mail string to keep you posted. Let me know if you hear anything else about the Kenmore area.

Take care,
Heather

LCDR Heather St. Pierre
Chief, Waterways Management Division
U.S. Coast Guard Sector Puget Sound
1519 Alaskan Way South
Seattle, WA 98134-1192
206-217-6042
heather.j.st.pierre@uscg.mil

-----Original Message-----
From: EEdwards@mansonconstruction.com
[mailto:EEdwards@mansonconstruction.com]
Sent: Sunday, March 25, 2012 8:43 AM
To: St.Pierre, Heather LCDR; Overton, Randall; LaBoy, Anthony ENS
Cc: Monica Blanchard; Jessi Massingale; andy.hoff@kiewit.com; Frank.Young@kiewit.com; Erik.Nelson@kiewit.com; Ron.Wika@kiewit.com; Robert.Brenner@kiewit.com
Subject: RE: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Good morning LCDR Heather St. Pierre- Island Tug and Barge (ITB) uses the slip and North dock to berth a gravel barge for Cal Portland Concrete Company. ITB typically shifts in and out of the slip on a twice per week schedule. KGM coordinates this with both Cal Portland and ITB to verify we do not interfere with their schedule.

KGM looks forward to working with USCG, USACE and Lake Washington stakeholders to assure a safe and successful completion to the SR520 project.

Regards,
Eric

Description: KGM_logo.gifEric Edwards
Marine Assembly Manager | Kiewit/General/Manson, A Joint Venture
SR 520 Evergreen Point Floating Bridge
3015 112th Ave N.E., Suite 100 Bellevue, WA 98004
(p) 425-576-7081 | (c) 510-773-6934

From: Heather.J.St.Pierre@uscg.mil [mailto:Heather.J.St.Pierre@uscg.mil]
Sent: Saturday, March 24, 2012 8:07 AM
To: Eric Edwards; Overton, Randall; LaBoy, Anthony ENS
Cc: Monica Blanchard; Jessi Massingale; andy.hoff@kiewit.com; Frank.Young@kiewit.com; Erik.Nelson@kiewit.com; Ron.Wika@kiewit.com; Robert.Brenner@kiewit.com
Subject: RE: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Good Morning Mr. Edwards,

Thank you for your quick response and additional details. Are there other tugs or companies that are using the facility as moorage? We may follow up with you if we have any questions as the bridge pontoon project becomes more active in the immediate area, and will be so for quite some time, so we appreciate your response and assistance. Best of luck on the project.

Regards,

LCDR Heather St. Pierre
Chief, Waterways Management Div.
USCG Sector Puget Sound
Sent with Good (www.good.com)

-----Original Message-----
From: Eric Edwards [EEdwards@MANSONCONSTRUCTION.COM]
Sent: Friday, March 23, 2012 09:51 PM Eastern Standard Time
To: Overton, Randall; St.Pierre, Heather LCDR; LaBoy, Anthony ENS
Cc: Monica Blanchard (MBlanchard@MansonConstruction.com); Jessi Massingale; andy.hoff@kiewit.com; Frank.Young@kiewit.com; Erik.Nelson@kiewit.com; Ron.Wika@kiewit.com; Robert.Brenner@kiewit.com
Subject: RE: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Good Evening-

Kiewit- General- Manson (KGM) was conducting operations at our Kenmore dock facility with the Derrick Barge 24 and Tug Nancy M on both Tuesday (3-20-12) and Wednesday (3-21-12). The entrance channel and slip at Kenmore have approximately 14-18ft of water depth. DB24 drafts 7ft and Tug Nancy M drafts 11ft. No grounding or bottom disturbance occurred during the operations.

KGM has been and will continue to coordinating with all the stakeholders in the industrial park who are: Kenmore Air, Cal Portland and Lakeshore Construction to assure we do not block access to the waterway.

I would be happy to discuss this issue in further detail at your convenience. Please don't hesitate to call or write if further information is required.

Kind regards,
Eric Edwards
Marine Assembly Manager | Kiewit/General/Manson, A Joint Venture SR 520 Evergreen Point Floating Bridge
3015 112th Ave N.E., Suite 100 Bellevue, WA 98004
(p) 425-576-7081 | (c) 510-773-6934

-----Original Message-----
From: Monica Blanchard
Sent: Friday, March 23, 2012 5:17 PM
To: Eric Edwards
Subject: Fw: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore
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Sent using BlackBerry

Note: This message was sent from my mobile phone.

----- Original Message -----
From: St.Pierre, Heather LCDR [mailto:Heather.J.St.Pierre@uscg.mil]
Sent: Friday, March 23, 2012 05:08 PM
To: Monica Blanchard
Cc: jessi.massingale@floydsnider.com <jessi.massingale@floydsnider.com>; Overton, Randall <Randall.D.Overton@uscg.mil>; LaBoy, Anthony ENS <Anthony.P.Laboy@uscg.mil>
Subject: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Good Afternoon,

The USCG (Sector Puget Sound) and USACE received a report today that some citizens were concerned about tugs and crane barges involved in the SR 520 bridge project at the Kenmore Industrial Park. It was reported that tugs and crane barges involved in this project were grounding and disturbing bottom sediments to subsequently refloat the barges. This was believed to have caused shoaling in other nearby areas and impacting other waterway users and the navigability of the surrounding area.

If one of the towing vessels or if a certificated barge has grounded, this information must be reported to the Coast Guard as well.

We ask for your cooperation in working with us as well as the other waterway users in the area. If you have any questions, please let us know.

Regards,
LCDR Heather St. Pierre
Chief, Waterways Management Division
U.S. Coast Guard Sector Puget Sound
1519 Alaskan Way South
Seattle, WA 98134-1192
206-217-6042
heather.j.st.pierre@uscg.mil

-----Original Message-----
From: Elizabeth Mooney [mailto:elizabeth.mooney@comcast.net]
Sent: Thursday, March 29, 2012 11:08 AM

To: Ann Hurst
Cc: <gste461@ecy.wa.gov>; <happyhaze@msn.com>; <patrickeobrien@comcast.net>; <mobr461@ecy.wa.gov>; <cwan461@ecy.wa.gov>; larry.fisher@dfw.wa.gov; Kendall, David R NWS; David Radabaugh; Jeannie Summerhays; Clay Keown
Subject: Re: ERTS Information 632786

Hi all,

Could somebody please help solve this problem- where did the dioxins and PCB's at Harbour Village Marina come from and is the barge's churning up of lake sediment allowed or did it need an HPA from WDFW?

First of all, I observed pre- and post- barge activity on March 21 2012. I have an eye witness to the pre-barge moving event (Patrick Obrien on phone with Greg Stegman) when the people in the small boat were working in the water off the NW point of Kenmore Industrial Site (aka Lakepointe).

I contacted Greg by telephone this morning.

I have an appointment with Gary Sergeant Friday at 2pm.

I would like to call Mr. White. What is his number?

Who is the owner of the barge operation? Who is responsible if there is alleged translocation of lake sediment or contaminants of concern? Who is responsible for cost (of clean up if necessary) IF there has been translocation of contaminants of concern? How does anyone know if there is translocation of lake or stream sediments unless there is a prerequisite for measuring and monitoring? Who is regulating the water quality of these public locations?

Who should meet to talk to work out questions and answers? WSDOT; Pioneer Towing; Kiewit General Manson; ACE; NOAA, WDFW, DNR, City, Citizens? DOH, Harbour Village Marina and HV Condos, Adopt a stream foundation...

Sent from my iPhone
On Mar 29, 2012, at 7:30 AM, Ann Hurst <annmhurst@msn.com> wrote:

The below should read, "one Ecology expert in email mentioned the Navigation Channel as a potential source of PCB and Dioxin contamination at Harbor Village Marina," because of PCB contamination in Navigation Channel in 1996, as I recall.

From: <mailto:annmhurst@msn.com> annmhurst@msn.com
To: <mailto:gste461@ecy.wa.gov> gste461@ecy.wa.gov
CC: elizabeth.mooney@comcast.net; happyhaze@msn.com; patrickeobrien@comcast.net; mobr461@ecy.wa.gov; <mailto:cwan461@ecy.wa.gov>

cwan461@ecy.wa.gov
Subject: RE: ERTS Information 632786
Date: Thu, 29 Mar 2012 06:25:27 -0700

Greg,
I did include the summary of your report at BasinNews.org and will post your document including the letter I wrote on the Documents page soon with WSDOT's response. I did not call Ecology. I wonder who did in addition to Elizabeth. That should be determined. Also, do you have the study of 1996 or 1998 that showed PCB contamination in the Navigation Channel?; one Ecology expert in email mentioned the Navigation Channel as a potential source of PCB and Dioxin contamination at Lakepointe. Janet and I will be looking at Ecology documents this morning and would appreciate not having to dig too deeply for that. Three experts point to three likely sources. I am thinking they all could be correct, that there is more than once source regarding contamination at Harbor Village Marina.
Best, Ann Hurst

_____

From: "Greg Stegman (ECY)" <GSTE461@ECY.WA.GOV>
To: "elizabeth mooney" <elizabeth.mooney@comcast.net>
Cc: "Maura O'Brien (ECY)" <MOBR461@ECY.WA.GOV>
Sent: Wednesday, March 28, 2012 4:06:28 PM
Subject: ERTS Information 632786

Elizabeth,
Attached is my report regarding my visit to the site on 3/21/12 concerning the barge issue and other issues we discussed. I also have photographs if you are interested.

Greg Stegman
Department of Ecology
Water Quality Program
Northwest Regional Office
425-649-7019

The information about incident number 632786 is attached in PDF format.

Note: You need to have an Adobe Acrobat Reader to read the information.

Classification: UNCLASSIFIED
Caveats: NONE

Agencies Response to Comment #11

11A. Enforcing Washington Clean Water Act

Response – See Ecology's multiple responses to citizen comments and questions about turbidity and Washington Clean Water Act. See Response 1E above.

11B. Access to CalPortland and KIP sites for sediment sampling.

Response – A new sediment sample has been added at the northeast end of KNC, and see Response 1A above.

11C. Source(s) of dioxin found at Harbour Village Marina.

Response - This SSAP is the next step in evaluating the lateral extent of dioxin/furans at the northeast area of Lake Washington and Sammamish River. The SSAP will investigate the source or sources for dioxin/furans in this area. Currently, the source(s) are unknown.

Comment #12 from Elizabeth Mooney

From: elizabeth.mooney
Sent: Monday, October 29, 2012 9:18 PM
To: O'Brien, Maura (ECY)
Cc: Ann Hurst; Janet and Bob Hays; Elizabeth Mooney
Subject: Kenmore Sediment and Water Characterization SAP 10-12-12 Comment

October 28, 2012

Maura O'Brien
Department of Ecology

Dear Maura,

I believe that, in addition to your plans for the Kenmore Sediment and Water Characterization SAP 10-12-12:

DOE should force Calportland, Pioneer Towing, etc. to allow sediments on their property to be tested because there is reasonable cause to suspect they are contaminated and, furthermore, may be the source of contamination. The potential risk to public health necessitates prompt action.

You have enough evidence and I hope you could find more money from your agency or other state agencies, such as WADOT, to fund further testing. I am attaching evidence that contaminants probably are causing there to be a "take" during chinook fall migration up the Sammamish River (Cottage Lake wild population), that PCB's (found at Pioneer Towing and present in fish in Lake Washington) can cause harm to those fish, that Ecology is aware that cement is associated with dioxins (Dioxin WA State Assessment), that barges caused illegal turbidity in the head of the channel in the area of the Kenmore Navigation Channel AFTER I had warned Mr. John White that his project (SR 520 anchor/deck) should have an HPA BEFORE they translocated sediments. Mr. White said to me, "But, they (Calportland) have been barging."

My point, Maura, is that they (Calportland) has been barging and WSDOT knew it and they shouldn't have been barging and churning up sediment at the bottom of the lake for years without proper permits, but they were and now I would deeply appreciate it if DOE could persuade them of the need to test. I do understand that the process is going to take some time to solve, but it would help to have cooperation from all parties for testing.

I have a Master's Degree in Fisheries from UW, a BA in Philosophy from Pomona College and I'm President of PERK, People for an Environmentally Responsible Kenmore, and I served on the Citizens Advisory Committee for the Kenmore Shoreline Master Plan Update. Please respect my opinion as not only an academic, a mother, but also as a scientist who discovered, by myself, without your agency's full disclosure, the presence of high levels of dioxins at Harbour Village Marina. There was an ERTS call from DNR to DOE in Oct 2011, but your agency didn't disclose it, and yet your agency allowed this SR 520 project to proceed. I know our former city manager contributed to the project happening in Kenmore. Enough is enough. We see the project will proceed, but please test the area where there is strong reason to believe there may be a source of the PCB or dioxin contaminants, by Calporltand and

the KIP site, in the sediments or when the barges/tugs are churning up the sediment. The DOE document I've attached has a section about how a cement facility may be associated with dioxins.

If the companies will not allow testing, then why should their barging be allowed if there is evidence of translocation of sediment in Lake Washington?

I am including two recent (last few months) photos taken by our new city manager showing evidence of the burned wharf at Calportland. My understanding is that burning may produce dioxins. Isn't it critical to test in this area? Would lack of testing here constitute a data gap in the study, and potentially call into question the entire integrity of the Kenmore Sediment and Water Characterization SAP analysis/testing plan-project?

Please amend the Sampling plan, if possible, to test in front of Calportland. There are other reasons I think this is important.

Calportland received special Shoreline Master Plan perks to change wording to their benefit, not the public's, in my opinion. My colleagues and I do not approve of the changes Calportland proposed, city approved and Dept of Ecology approved. I informed the city of dioxins that DOE already had learned about from DNR. The barging may impact our public health and ecology. The only way I can believe our public can be protected from possible dioxin contamination by turbidity from ongoing increased barge/tug alleged illegal turbidity and translocation of contaminants is by Dept of Ecology succeeding in convincing the companies that testing the sediments under water (shorelands) and/or water (during tug/barge activity) beside Calportland is a good idea. From these photos, you can see Calportland's "head of the channel"s sediments" might harbor a possible source of dioxins. If so, these contaminants may cause harm to federally protected species and human health. It would be stronger study if you could find a way to include Calportland's inner head of the channel in the testing.

Since the wharf was burned, since there are high dioxins at Harbour Village Marina, since the city is spending $100,000 dollars to test for a very coarse evaluation, and since the translocation of sediments under water continues with barge activity, please do your best for the citizens of Kenmore to persuade the big companies to allow your testing? You are the best person who can find a way to test. If the companies won't let your agency test, can you suggest the city recommend the companies stop barging until they do so?

Since water quality is DOE's responsibility and since WSDOT's project must follow the laws, and since it appears that the barges/tugs cause violation of water quality laws, if barging continues, then it would be great if testing where translocation occurs/occurred, should take place.

We don't want to risk waste of public money nor public health. This waterway appears to have been affected by translocation of sediment. So, here is evidence of fire on the wharf that DOE and the City of Kenmore told Calportland they would be able to expand (Dave Radabaugh and Jeff Talent?). I hope DOE could coordinate and achieve testing of sediment under water at Calportland/Pioneer Towing in the "head of the channel" where the burned wharf (possible source of dioxin) exists.

May you expand the testing to include the testing by Calportland since I believe there has been translocation of sediment in Lake Washington (my ERTS # 632786 March 2012)? The KGM and WSDOT operators should have acquired an HPA because it appears that there has been movement of bottom sediments. I asked WADOT to factor in that their barge activities would likely translocated

sediments on the lake bottom and that it would require an HPA. They decided not to factor that into their SR 520 project, something I believe was not the right thing to do.

I have spoken to my friend Ann Hurst and she adds:
Often the tugs cannot turn the barges South without the tugs leaving the Kenmore Navigation Channel and gunning it next to Harbour Village Marina. The barges are too large and cumbersome for the design of the channel. The City told WSDOT that the barges would fit in the channel, WSDOT was told by Kiewitt/General/Manson that there would only be one barge per day and neither of those assertions were correct . Ecology, the State, has plenty of leverage to stop the barge traffic, and Ecology, then, to test the shore lands of Cal Portland and the Pioneer Towing Land. The Governor might even join in with Ecology to assert testing on those shore lands as she is plenty upset about the cracks in the pontoons K/G/M transported from Aberdeen. Even so, apparently, it is far easier to follow Water Quality Act barging from Aberdeen. There is precedent for Ecology to require the private companies pay for the testing.

Elizabeth Mooney
Sent from my iPhone

Begin forwarded message:

From: Rob Karlinsey <rKarlinsey@kenmorewa.gov>
Date: October 29, 2012 10:34:08 AM PDT
To: Elizabeth Mooney <elizabeth.mooney@comcast.net>
Subject: RE: photo

Sorry I left before I saw your email. Here you go. From a distance these pilings look like they're just covered in dark creosote, but when you get up close, you can tell that a lot of it is charred from a fire.

From: elizabeth.mooney@comcast.net [mailto:elizabeth.mooney@comcast.net]
Sent: Saturday, October 27, 2012 11:38 AM
To: Rob Karlinsey
Subject: photo

Rob
If you have that photo, that'd be grand to have for tomorrow.
Thanks
Elizabeth

Agencies Response to Comment #12

12A. Sediment sampling – see Response 11B above.

12B. Question about the WSDOT 520 Bridge project to proceed.

Response – The WSDOT 520 Bridge project was within City, County and State permits and requirements to begin.

12C. Photographs of burned wharf at CalPortland and request to sample at location.

Response – see Response 1A above.

12D. WSDOT 520 Bridge work at KIP requiring a HPA

Response – No HPA was required and see Response 12B above.

Comment #13 from Mamie Bolender

Comment # 13

O'Brien, Maura (ECY)

From: Mamie Bolender [mamiejb@hotmail.com]
Sent: Monday, October 29, 2012 10:55 PM
To: O'Brien, Maura (ECY)
Subject: Need for testing for dioxins at Kenmore/Lake Forest Park

Maura O'Brien
Washington State Department of Ecology

Dear Ms. O'Brien,

There is sufficient evidence that Dioxins are present to some eignificant degree in the waters off Kenmore which are being plied by barges which are disturbing the sediment of the region and causing these sediments and any toxins therein to be churned up and suspended in the water. These released sediments are being set free to float along and onto all the shores of North Lake Washington and beyond, contaminating the swimming beaches of Kenmore and Lake Forest Park and beyond. Dioxins are, inarguably, extremely toxic and detrimental to the health of our children and all who use these beaches for swimming and playing, but mostly the children. Unaware of this unseen danger, parents are allowing hundreds of children to be exposed to this hazard.

Extended testing must be done, and done soon, of the sediments along the north end of Lake Washington to determine the extent of migration of these sediments and the dangerous dioxins they contain.

Please cause this important testing to happen. The health of many children is at stake. This is a personal plea.

Respectfully submitted,

Mamie Bolender, mother, grandmother and co-president of the Lake Forest Park Stewardship Foundation

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Agencies Response to Comment #13

13. Request for dioxin testing at Kenmore and Lake Forest Park beaches for children safety.

Response – Yes the SSAP includes sediment testing for dioxin and other chemicals for public health and safety especially children.

Comment #14 from Janet Hays

From: happyhaze@msn.com [mailto:happyhaze@msn.com]
Sent: Monday, October 29, 2012 11:28 PM
To: O'Brien, Maura (ECY)
Subject: scan0033.pdf

Comment #14

Sept 29, 2012
10:54

Dear Maura,

As you know I have worked diligently on keeping the waters of the State (Lake Washington and the Sammamish River for 5 years. I am not paid to do this and ~~I~~ I do not have the credentials or the responsibility of your job. But some how I have chosen to invest my time and energy on documenting ~~writing~~ what ~~the wrong~~ I see occurring daily on the property called Kenmore Industrial Park since 2007. In that time I have made it my business to take pictures at least a few pictures ~~one~~ everyday that I have witnessed tug and barge after tug and barge come in and out. I have witnessed Gary Sergeant's lessees paint, weld, pump bilges into the lake, burn palettes on the shoreline and Glacier cement front load all their waste water from ~~[illegible]~~ cement trucks and surface water right into the lake ~~[illegible]~~ directly into the head of the chanel. I have document 3 years of Waterfront Construction fueling over the water from fuel trucks the equipment on there...

Lake Shore Marine Construction part large floating boats set over the water,

I have sent you many pictures of these violations, when we brought the Clean water suit against Waterfront Construction. It was because you and the understaffed DOE did not enforce or question the owners & the property you just accepted their lies as fact. Waterfront Construction did not even have an NPDES permit when I began reporting to you what I was seeing and documenting. In fact as you said at a Kenmore Master Plan Commission Sept 21 2009 meeting that the monitoring of the ground water [redacted] was never done for 8 years even though the consent decree stated your agency DOE was to oversee and enforce monitoring twice a year in wet and dry season. This did not occur until 2009 [redacted] a gap of 8 years. Your explanation to the commission was it fell through the cracks.

Now we have watched as BIG barges and tugs still the same not [illegible] are creating turbidity

from the wharf you cannot test in front of because it is private property.

This wharf & the Cal Portland pier are being used as it is the only point of egress and ingress for this activity. The amount of sand and gravel barges has increased from 2 a week to 2 or three a day. The barge-tugs from Kiewit are not one per week. They are daily upto 16 loads when hauling barges filled with cement trucks. They continue to traverse out of the head of the channel ~~to hang the~~ out side of the buoys marking the channels width and boundary hugging the shoreline directly in front of the North shore (Chip Davidson's Marina) and then make a sharp turn and gun their cargo either south or further west to docking stations. I have stood at the Kenmore air pier and Harbor Village pier taking pictures of the water which is so filled with sediment your camera lens cannot see 6 inches into it.

I do not understand how Cal Portland / Glacier / Tuyo - and [illegible] Kenmore Air

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can be allowed to opt out of this sediment testing. Given the amount of dioxins found at Harbor Village. And the readings clearly showed it get worse the closer it is to the head of this channel.

Please consider this in a revision to test as close as you can get to this private head of the channel.

My concern is for my community and the environmental health not commerce as our Shoreline Master Plan's wording was changed from commercial to manufacturing. We the community are now finding out why. It is no longer able to recover from the sediments being shifted from the east end of the channel to the docking stations even to the zigzagging and maneuvers they have been doing to widen the channel and dredge it themselves with these big barges and tugs. No one is hearing us, not because it isn't happening but because these property owners don't want to know.

Thank You

[illegible signature]

P.S. Sorry this is hand written [illegible] failing

(5)

P.S. I am not a scientist. This is from my heart and what I have witnessed, photographed and documented daily.

Thank you
Janet

Agencies Response to Comment #14

Comment 14A. I have worked to protect waters of Washington State especially Lake Washington and Sammamish River and have photographed many, many environmental events over 5 years.

Response – The City, Ecology and the community appreciate your documentation of events at Lake Washington and Sammamish River and waters of Washington. The SSAP will be one more step in evaluating the environmental conditions at these Kenmore area locations and Lake Forest Park.

Note, page 2 you mentioned that the KIP Consent Decree requires twice year groundwater monitoring and Ecology did not enforce this. This statement is incorrect and the Consent Decree does not require twice year monitoring. The Consent Decree requires periodic groundwater compliance monitoring and this was conducted in 2009-2010. The 2012 monitoring in April and October will also count as periodic monitoring, so the next periodic monitoring will be 2017.

14B. Tug and barge traffic and turbidity – see above Response 1E above.

Comment #15 from Jim Halliday

Comment #15

O'Brien, Maura (ECY)

From: Jim Halliday [jimh@clearwire.net]
Sent: Tuesday, October 30, 2012 9:23 AM
To: O'Brien, Maura (ECY)
Subject: Sediment testing

Dear Ms. O'brien - I feel future liability risks should require DOE to force Calportland, Pioneer Towing, etc. to allow sediments on their property to be tested because there is reasonable cause to suspect they are contaminated and, furthermore, may be the source of contamination. The potential risk to public health necessitates prompt action.

Jim

Jim Halliday
206-365-1813
jimh@clearwire.net

Co-chair - Lake Forest Park StreamKeepers
Board member - Lake Forest Park Stewardship Foundation
LFP Liaison - People for an Environmentally Responsible Kenmore (PERK)
Board member - Sno-King Watershed Council

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Agencies Response to Comment #15

15. Request sediment sampling at CalPortland and KIP sites.

Response – see Responses 3A and 3B and 7N-2 above.

Appendix A

Appendix A includes copies of the citizen comments as received plus attachments.

Comment #1

O'Brien, Maura (ECY)

From: Ann Hurst [annmhurst@msn.com]
Sent: Tuesday, October 16, 2012 12:03 PM
To: O'Brien, Maura (ECY); chingpi.wang@ecy.wa.gov; Warren, Bob (ECY); rkarlinsey@kenmorewa.gov; bhampson@ci.kenmore.wa.us; bhampson@kenmorewa.gov; david.r.kendall@usace.army.mil; Hardy, Joan (DOH); harbourvillage@frontier.com
Cc: c4sep; stedward; nlccannouncements@yahoogroups.com
Subject: Anchor Testing, why not Cal Portland?
Attachments: Extraction of Dioxins from Environmental Samples by Pressurized Solvent Extraction (PSE).pdf

Maura O'Brien, Kenmore Yard Site Manager, and Rob Karlinsey, Kenmore City Manager,
My apologies if I added to the confusion. I was mistaken; in 1996 sample S1 was in nearly same location as proposed SG4 by Anchor (I mis-read the 1996 map).
Why the Cal Portland area was not tested for contaminants in 1996 and will not be by Anchor in forthcoming tests, however, yet remains a mystery to the public. In the past and perhaps today because it is not being proposed for dredging? What about disturbing the sediments for a new dock? It was my understanding that Cal Portland will get a new dock, has a new dock? **Do I find the permits/E.I.S. or DNS on Cal Portland dock with City or Ecology?**
I have researched that a batch plant that uses fly ash may contribute significantly to Dioxins when filling the fly ash flue through faulty equipment (warning bells not activated, bags in disrepair, operator error) a repeated occurrence at this site over decades, how much is documented depends on complaints and self-reporting. I yet advocate testing the Cal Portland shore lands as it looks to me like the flue is close to the water and Cal Portland's tax info indeed says Cal Portland is on the water, though Cal Portland did self-report the latest, known incident.
Is the attached on Dioxin extraction new, useful in cutting costs, accurate?
All parties are moving in a good direction; I yet advocate that the turbidity at Harbour Village Marina, created by the WSDOT contractors tugs and barges as the contractors try to turn the barges 90 degrees, stop. Pretty easy to observe, pretty easy to fine, pretty awful for the residents who have repeatedly, daily been exposed to the turbid water and horrific if this exposure affects their even not yet conceived children.
Do you really think the barge contractors will self report their turbidity violations in the future if for the past months, since March, they have not done so -- even once -- and cannot make the turn without creating turbidity?
Best, Ann Hurst

Washington State Department of Transportation

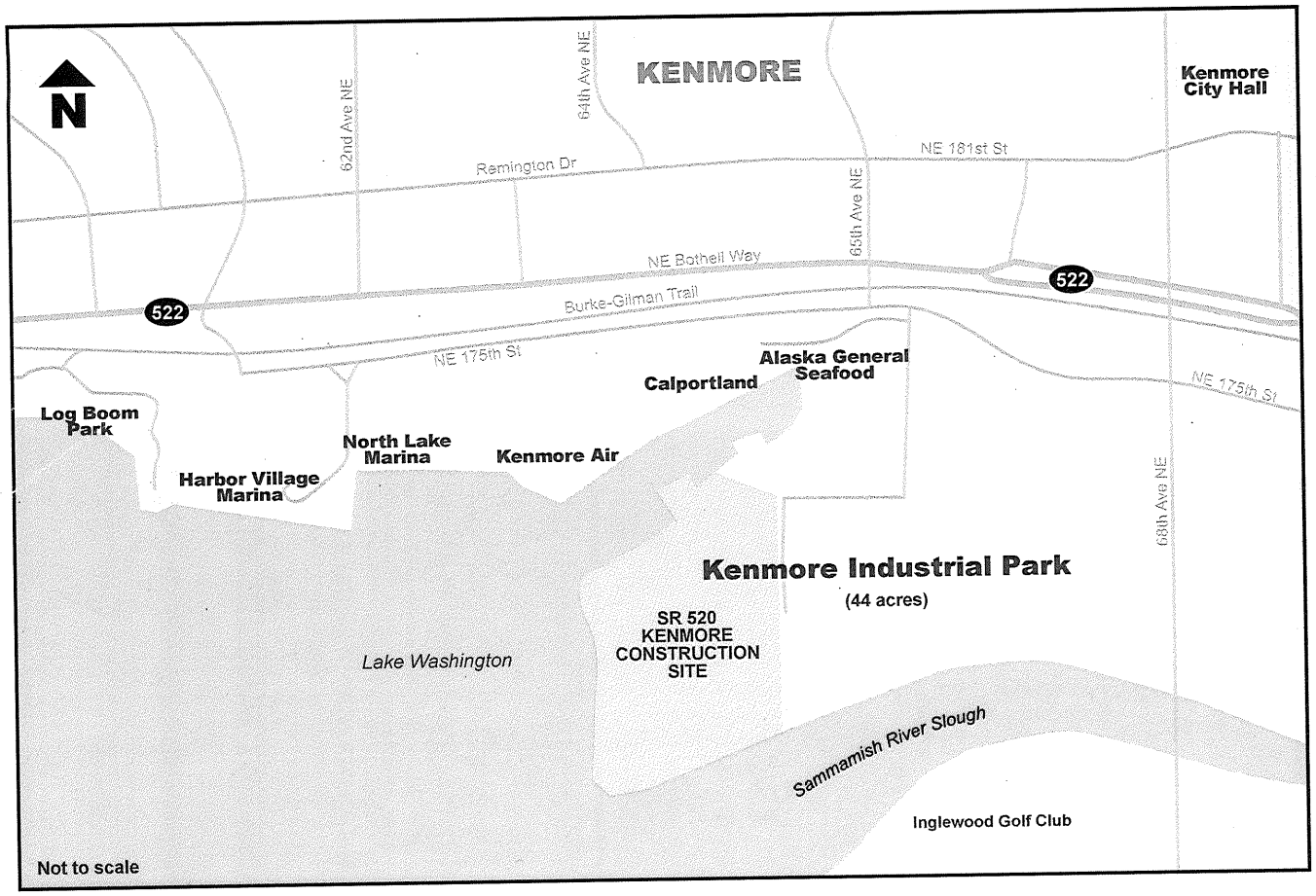
SR 520 Bridge Replacement and HOV Program

I-5 to Medina: Bridge Replacement and HOV Project

STATE ROUTE 520

Kenmore Industrial Park and surrounding area

June, 2012



November 2011

April 2012

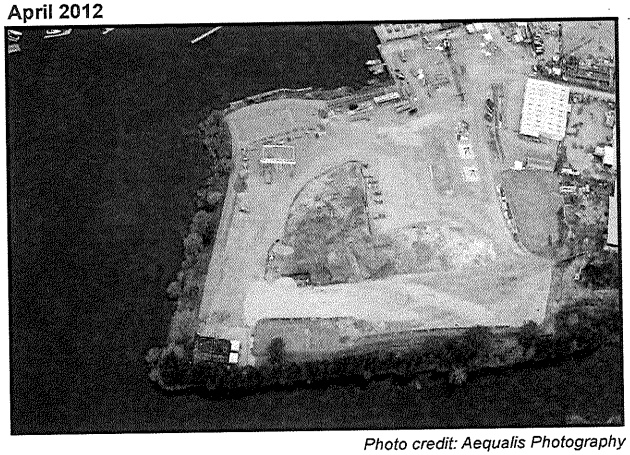


Photo credit: Aequalis Photography

onePSE #211
APPLICATIONS

Extraction of Dioxins from Environmental Samples by Pressurized Solvent Extraction (PSE)

Introduction

Pressurized solvent extraction is a new technique that reduces solvent consumption and sample preparation time. Solvent is pumped into an extraction vessel containing the sample and is heated and pressurized. The pressurized solvent at high temperature accelerates the extraction process by increasing the solubility of the analyte in the solvent and also increasing the kinetic rate of desorption of the analyte from the sample matrix.

Pressurized solvent extraction can be used to replace soxhlet and sonication techniques and is approved for use as EPA Method 3545. This method is a procedure for extracting water insoluble or slightly water soluble, semi-volatile organic compounds from soils, clays, sediments, sludges, and waste solids. The method is applicable to the extraction of semi-volatile organic compounds, organophosphorous pesticides, organochlorine pesticides, chlorinated herbicides, and PCBs.

This application note describes the pressurized solvent extraction of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) from fly ash.

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Allentown, PA 18101
610-770-0900
610-740-5520 (FAX)
www.appliedseparations.com

one PSE #211 APPLICATIONS

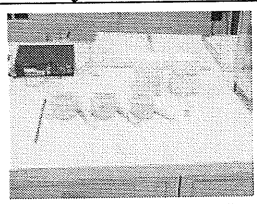
Equipment

- ✓ Applied Separations' *one* PSE Pressurized Solvent Extractor
- ✓ 11 mL Extraction Vessel-Cat.#10625
- ✓ GC or GC/MS

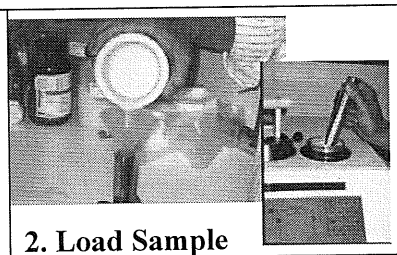
Solvents and Materials

- ✓ Toluene (pesticide grade)
- ✓ Acetic Acid (reagent grade)
- ✓ S/S Frits (10 micron)- Cat. #10710
- ✓ Collection Vials (60mL for extract collection)-Cat.#10650
- ✓ *Spe-ed*™ Matrix-Cat.#7950
- ✓ Ottawa Sand – Cat. #10548
- ✓ Cellulose Filter Disk-Cat. #10711

Summary of Method

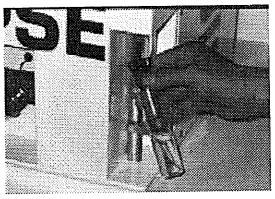


1. Prepare Sample



2. Load Sample

3. Run Sample



4. Collect Extract

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610-740-5520 (FAX)
www.appliedseparations.com

Procedure

Prepare Sediment/Soil Samples

Decant and discard any water layer on a sediment sample. Mix the sample thoroughly, especially composited samples. Discard any foreign objects such as sticks, leaves, and rocks. Air-dry the sample at room temperature for 48 hours in a glass tray or on hexane-rinsed aluminum foil. Alternately, mix the sample with an equal volume of anhydrous sodium sulfate or *Spe-ed* Matrix until a free-flowing powder is obtained.

NOTE: *Dry, finely-ground soil/sediment allows the best extraction efficiency for nonvolatile, nonpolar organics, e.g., 4,4'-DDT, PCBs, etc. Air drying may not be appropriate for the analysis of the more volatile organochlorine pesticides (e.g., the BHCs) or the more volatile of the semi-volatile organics because of losses during the drying process.*

Dry sediment/soil and dry waste samples amenable to grinding. Grind or otherwise reduce the particle size of the waste so that it either passes through a 1mm sieve, or can be extruded through a 1mm hole. Disassemble grinder between samples, according to the manufacturer's instructions, and decontaminate with soap and water, followed by acetone and hexane rinses.

Gummy, fibrous, or oily materials not amenable to grinding should be cut, shredded, or otherwise reduced in size to allow mixing and maximum exposure of the sample surfaces for the extraction. The addition of anhydrous sodium sulfate to the sample (1:1) may make the mixture amenable to grinding.

Determination of Dry Weight

When sample results are to be calculated on a dry weight basis, a second portion of sample should be weighed at the same time as the portion used for analytical determination.

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Immediately after weighing the sample for extraction, weigh 5 – 10 g of the sample into a tared crucible. Dry this aliquot overnight at 105 °C. Allow to cool in a desiccator before weighing. Calculate the % dry weight as follows:

$$\% \text{ dry weight} = \frac{\text{g of dry sample}}{\text{g of sample}} \times 100\%$$

Grind a sufficient weight of the dried sample to yield the sample weight needed for the determinative method (usually 10 – 30 g). Grind the sample until it passes through a 10-mesh sieve.

Load Sample

Prepare the extraction vessel(s) for analysis by placing a cellulose filter disk in the bottom opening followed by a 10µm s/s frit, and secure them in place with the retaining nut. Transfer the ground sample to an extraction vessel of the appropriate size for the analysis. Generally, an 11 mL vessel will hold 10 g of sample, a 22 mL vessel will hold 20 g of sample, and a 33 mL vessel will hold 30 g of sample.

Add the surrogates listed in the determinative method to each sample. Add the matrix spike/matrix spike duplicate compounds listed in the determinative method to the two additional aliquots of the sample selected for spiking.

Add clean Ottawa sand to within 1 cm of the top of the vessel's interior flange (see illustration on page 4-3 of User's Manual).

Next, place the extraction vessel into the *one* PSE oven. Load the *one* PSE collection rack with the appropriate number (one per sample) of 60 mL, precleaned, capped vials with septa. Set method conditions on the *one* PSE and start the extraction.

Extraction Conditions

Program the following extraction parameters on the one PSE

Program A Mode – 11 mL vessel

Solvent:	Toluene or Toluene/Acetic Acid (5% v/v) if sample is pretreated with HCl
Temperature:	150 ° C
Pressure:	150 Bar
Cycles:	3
Static:	5 minutes
Pause:	N=0
Flush:	Solvent/gas/repeat flush:20 sec/2min/0

Cleanup

Collect each extract in a clean 60 mL vial. Allow the extracts to cool after the extractions are complete. Collected extracts will be approximately 1.2 to 1.4 times the vessel volume.

The extract is now ready for cleanup or analysis, depending on the extent of interferants. Refer to Method 3600 for guidance on selecting appropriate cleanup methods. Certain cleanup and/or determinative methods may require a solvent exchange prior to cleanup and/or sample analysis.

Analysis

GC/MS

Results

Recovery (ug/Kg) from Fly Ash

Dioxins	PSE	Soxhlet
4CDD	10.5	12.0
5CDD	16.2	16.6
6CDD	36.7	38.2
7CDD	16.0	15.0
8CDD	10.6	11.4

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References

US EPA Method 3545 – Pressurized Fluid Extraction
US EPA Method 3600 – Cleanup
US EPA Method 8280A – Dioxin by HRGC/LRMS
US EPA Method 8290 – Dioxin by HRGC/HRMS

Safety

The use of organic solvents, elevated temperatures, and high pressures present potential safety concerns in the laboratory. Common sense laboratory practices can be employed to minimize these concerns. However, the following sections describe additional steps that should be taken.

Extraction vessels in the *one* PSE oven are hot enough to burn unprotected skin. Allow the vessels to cool before removing them from the oven, or use appropriate protective equipment (e.g. insulated gloves or tongs) as recommended by the manufacturer.

During the gas purge step, some solvent vapors may exit through a vent port in the instrument. Connect this port to a fume hood or other means to prevent release of solvent vapors to the laboratory atmosphere. This precaution also applies to the removal of post extraction solvent from the collected extract.

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www.appliedseparations.com

Comment # 2

O'Brien, Maura (ECY)

From: Kendall, David R NWS [David.R.Kendall@usace.army.mil]
Sent: Thursday, October 18, 2012 11:28 AM
To: elizabeth.mooney@comcast.net
Cc: dbent@kenmorewa.gov; landerson@kenmorewa.gov; Barney, Phyllis (ATG); happyhaze@msn.com; aaronmsmithlaw@gmail.com; Cleve Steward; Radabaugh, David (ECY); dreitan@insleebest.com; O'Brien, Maura (ECY); Wang, Ching-Pi (ECY); Hardy, Joan (DOH); Ann Hurst; Aaron Smith
Subject: RE: UPDATE draft sampling plan (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi Elizabeth: I have been out of office the last several days. Thank you for your observations and response. I want to stress that I do not know the PCB source for the Harbor Village Marina PCB/dioxin contamination, and would look to Ecology TCP to ultimately evaluate that question and concern.

I also have no doubt that you are observing suspension and redistribution of sediments in the area due to barge traffic in the navigation channel, and that some of these sediments may settle within the Harbor Village Marina.

My reasoning that there is another primary source of the PCBs is based on the ten-fold differences in PCB concentrations in the Harbor Village Marina and in the navigation channel. The PCB concentrations observed in the navigation channel material (detected Aroclor 1254, ranged from 15 - 27 ppb, averaging 21 ppb-dry weight, and TOC normalized concentrations ranged from 0.38 - 0.66 ppm-TOC, averaging 0.5 ppm-TOC) were well below (State Sediment Quality Standards(SQS), where they were quantitated at only 4.2% of the SQS (PCB SQS = 12 ppm-TOC. By comparison, the PCB concentrations in the Harbor Village Marina, ranged from a low of 196 ppb to a high of 277 ppb for Aroclor 1254, averaging 237 ppb, which are greater than ten times the PCB levels observed in the navigation channel based on the average concentrations. At least with the data in hand, it simply does not appear that there are enough PCBs in the navigation channel to have provided the level of contamination seen over time in the marina.

I think we will have to wait until the sediment investigation due to take place in early November provides the data to evaluate the PCB and dioxin concentrations throughout Kenmore. Hopefully that data will provide some answers. I know my interagency colleagues and I in the Dredged Material Management Program are anxious to gather the necessary data to evaluate the extent of the PCB/dioxin contamination at Kenmore, and are confident that the proposed testing strategy will be helpful to that end.

David

David R. Kendall, Ph.D.
Chief, Dredged Material Managment Office

Seattle District Corps of Engineers
Phone: 206/764-3768
email: david.r.kendall@usace.army.mil

-----Original Message-----
From: elizabeth.mooney@comcast.net [mailto:elizabeth.mooney@comcast.net]
Sent: Monday, October 15, 2012 1:08 PM
To: Kendall, David R NWS
Cc: dbent@kenmorewa.gov; landerson@kenmorewa.gov; phyllisb@atg.wa.gov; happyhaze@msn.com; aaronmsmithlaw@gmail.com; Cleve Steward; drad461@ecy.wa.gov; dreitan@insleebest.com; mobr461@ecy.wa.gov; cwan461@ecy.wa.gov; joan hardy; Ann Hurst; Aaron Smith
Subject: Re: UPDATE draft sampling plan (UNCLASSIFIED)

David,

I have read and reread your Oct 5 2012 email to Ann Hurst; unfortunatly, I disagree with your conclusion. I'd like to explain why by sharing my personal observation of tug/barge activity and subsequent brown sediment-laden water drifting into Harbour Village Marina, and ask if you believe you might reconsider your conclusion based on new information.

Before I do that, I want to thank you for correcting the record so we now know the type of PCB in both Harbour Village Marina and in the Federal Navigation Channel are the same, Aroclor 1254. I hope that Dept of Ecology reflects that in their website information. It is important that people understand these details and that they know that the PCB type in Harbour Village Marina is the SAME type as the PCB type in the Federal Navigation Channel. That is what is important, in my opinion. I appreciate your going to the trouble to correct the record in the email attached. It makes sense.

In your Oct 5 email to Ann Hurst, you state (and I added an underline and bold for emphasis for what I believe is most important):

My email clarifying error in letter (6/6/12):

Hi all: I would like to point out that in the fifth paragraph of Attachment 1 to response letter, it states that the Corps of Engineers "determined that the PCB fingerprints were significantly different at the two sites" (Federal navigation channel and Harbor Village Marina). I would like to correct the record that that statement is in error. The Fingerprinting indicates the Aroclor quantified at both sites was the same, Aroclor 1254, as noted in attached Figure. I wanted to correct the record, as there is a lot of misinformation out there regarding the testing at these two locations. Thanks.

David

David R. Kendall, Ph.D.

Chief, Dredged Material Management Office

The reason I disagree with your conclusion:

I have watched the barges numerous times in the navigation channel. I see them stop in front of Harbour VIllage Marina to turn their vessels. Most importantly, I've seen brown water in Harbour Village Marina AFTER the barges have departed Kenmore Navigation Channel, passed Harbour Village Marina and headed out into Lake Washington.

On the same day when Greg Wingard watched from the Hays' condo and noted a Clean Water Act violation in August 2012, I went, afterwards, to the HV Marina and talked to the Harbormaster Mike. Since that was the same day that Greg Wingard had noted the turbidity due to the tug/barge activity in the Kenmore Navigation Channel, I feel confident that what I was seeing at HVM was due to the barge activity. Additionally, the Harbormaster told me it was true. The Harbormaster told me to look out into the marina. I could easily see that brown water was in the Harbour Village Marina. Mike said that brown water enters HVM after the tug/barges pass the marina in the Navigation Channel. According to Mike, it happens all the time. Therefore, your conclusion in the email makes no logical sense to me. You stated that: "The concentrations of PCBs found in Harbor Village Marina were 10 times the concentrations found in the federal navigation channel in the 1996 characterization, and therefore, the navigation channel is not the likely source for the contamination in Harbor Village Marina." On the contrary, David, doesn't it make sense that if the barges have been churning up the bottom of the sediment in the Federal Navigation Channel, and if the wind or current drive the suspended sediment toward Harbour Village Marina, that the increase in concentrations of PCB's would build up in the Harbour Village Marina? From what I saw, I hypothesize that barge activity translocates the sediment, and that, subsequently, the sediment drifts into the marina where it can't go any further and settles onto the bottom. It builds up in the marina due to the barges churning up sediment in a Federal Navigation channel that has inadequate depth for the barges/tugs using it.

Based on my personal observation, when the barges churn up the sediment at the bottom of the too shallow Federal Navigation Channel with their too deep tugs' activities, the sediment appears to be churned up and the brown water (filled with the sediment) travels right into the Harbour Village Marina, due to wind or current or whatever. That is what I believe I saw happening.

Can you please help me understand? As you know, my goal is to protect our right to having Clean Water. First we need to know where to test to get the answers we need. I am concerned about the method of testing. Perhaps, based on this information, there may be a reason to have Anchor QEA take a different type of sample to determine the extent/source of the dioxin

and PCB at HVM. Since the Sediment Sampling draft went out today, I'd like to make sure you know about this brown water in HVM after tug/barge activity in the Navigation Channel.

Thanks very much,

Sincerely,

Elizabeth Mooney
206-979-3999

From: "David R NWS Kendall" <David.R.Kendall@usace.army.mil>
To: "Ann Hurst" <annmhurst@msn.com>, "Elizabeth.Mooney" <elizabeth.mooney@comcast.net>
Cc: dbent@kenmorewa.gov, landerson@kenmorewa.gov, phyllisb@atg.wa.gov, happyhaze@msn.com, aaronmsmithlaw@gmail.com, "Cleve Steward" <cleve.steward@amec.com>, drad461@ecy.wa.gov, dreitan@insleebest.com, mobr461@ecy.wa.gov, cwan461@ecy.wa.gov, "joan hardy" <joan.hardy@doh.wa.gov>
Sent: Friday, October 5, 2012 10:40:51 AM
Subject: RE: UPDATE draft sampling plan (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi Ann: I have to correct the statement below attributed to me in an earlier Ecology response letter to Representative Pollett. Ecology incorrectly quoted me relative to PCB fingerprinting of the Aroclors at Harbor Village Marina and the Federal Navigation Channel. I have attached my email notifying Ecology (Maura Obrien) of that error. The factual error was later corrected, but apparently the earlier uncorrected transmittal letter is still being circulated.

The concentrations of PCBs found in Harbor Village Marina were 10 times the concentrations found in the federal navigation channel in the 1996 characterization, and therefore, the navigation channel is not the likely source for the contamination in Harbor Village Marina.

David

David R. Kendall, Ph.D.
Chief, Dredged Material Managment Office

Seattle District Corps of Engineers
Phone: 206/764-3768
email: david.r.kendall@usace.army.mil

My email clarifying error in letter (6/6/12):

Hi all: I would like to point out that in the fifth paragraph of Attachment 1 to response letter, it states that the Corps of Engineers "determined that the PCB fingerprints were significantly different at the two sites" (Federal navigation channel and Harbor Village Marina). I would like to correct the record that that statement is in error. The Fingerprinting indicates the Aroclor quantified at both sites was the same, Aroclor 1254, as noted in attached Figure. I wanted to correct the record, as there is a lot of misinformation out there regarding the testing at these two locations. Thanks.

David

David R. Kendall, Ph.D.
Chief, Dredged Material Management Office

Seattle District Corps of Engineers
Phone: 206/764-3768
Fax: 206/764-6602
email: david.r.kendall@usace.army.mil

-----Original Message-----
From: Ann Hurst [mailto:annmhurst@msn.com]
Sent: Thursday, October 04, 2012 4:41 PM
To: Elizabeth.Mooney
Cc: dbent@kenmorewa.gov; landerson@kenmorewa.gov; phyllisb@atg.wa.gov; happyhaze@msn.com; aaronmsmithlaw@gmail.com; Steward, Cleve; drad461@ecy.wa.gov; dreitan@insleebest.com; mobr461@ecy.wa.gov; cwan461@ecy.wa.gov; Kendall, David R NWS; joan.hardy@doh.wa.gov

Subject: RE: UPDATE draft sampling plan

Elizabeth and All,
The 1996 sampling is attached, and yes, the channel where the docks reside was tested in 1996, with exceedances, but of the type that dissipate except for the relatively low PCB's. In an Ecology summary on line, Ecology states that Officer Kendall states, the type of PCB's found at Harbour Village Marina last year are not the same as found in 1996. What is off shore of Cal Portland in 2012 will be unknown without testing that area, and now we know with equipment failures and use of fly ash over time at the cement companies, the cement batch plants under various ownership and various controls of fly ash could be a cumulative source of the Dioxins.
As I read the RCW, and with informal info from County, since the docking area is within City Boundary, it is clearly City Responsibility; County responsibility in past.
There was no Dioxin testing in 1996, and we now know that materials containing PCB's degrade over time, so what was in 1996 would not be a footprint of what is today as I, a lay person, understand various explanations made by various scientists to me. And if there are the 1996 PCB types at Harbour Village Marina, they may be well buried, watching recently all the churning of barges at that corner of the Kenmore Navigation Channel closest to Harbour Village Marina, which may have been going on for years with cement barge traffic, it is not a surprise that the Harbour Village Marina needs dredging.
An Ecology summary also said Officer Kendall made a comment on the types of toxins in the past at Harbour Village Marina, not certain where that material resides; but as I would prefer actual source material, I am again bothering Officer Kendall by cc'ing him and hoping he can clarify. Thank you Officer Kendall.
All in all, if we don't get a good testing pattern and firm execution date, etc., I am not going to be a good sport, Phyllis and Dawn, especially today with the high barge traffic, turbidity, and other likely infractions, waiting for official report/s. Our health and it appears the workers' health is not being protected.
Best, Ann

Date: Thu, 4 Oct 2012 05:58:40 +0000
From: elizabeth.mooney@comcast.net
To: annmhurst@msn.com
CC: dbent@kenmorewa.gov; landerson@kenmorewa.gov; phyllisb@atg.wa.gov; happyhaze@msn.com; aaronmsmithlaw@gmail.com; cleve.steward@amec.com; drad461@ecy.wa.gov; dreitan@insleebest.com
Subject: Re: UPDATE draft sampling plan

Ann,

Isn't it the case that the water area (navigation channel) by Calportland/Lakepointe was tested in 1996? Why would anybody spend city money and Ecology's money to test if they aren't going to test there?

I left a message for our manager, Rob Karlinsey. It certainly was my understanding that city/Ecology money was to be spent looking for the source of the dioxins/PCB's. Would it make any sense to spend all that money on the Anchor QEA sampling if there is no sampling where they found PCB's in 1996? Am I forgetting something here?

Thanks.

Elizabeth

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Comment #3

O'Brien, Maura (ECY)

From: Ann Hurst [annmhurst@msn.com]
Sent: Wednesday, October 24, 2012 9:37 AM
To: O'Brien, Maura (ECY); Wang, Ching-Pi (ECY)
Cc: Barney, Phyllis (ATG); rkarlinsey@kenmorewa.gov
Subject: FW: [stedwards] Dioxin Levels Love Canal, Vietnam, No Kiewitt skin in game?
Attachments: message-footer.txt

Maura,
I am in receipt of Anchor testing plan of Kenmore's shore lands; thank you. I am troubled that Kenmore's industries do not want their shore lands tested for Dioxin contamination. My comment is that you obtain a Court Order or whatever is necessary to test these shore lands using the most comprehensive testing methods available and require the industries pay for the testing. Ample justification is in email below, an answer that the public sought from me which I think is fair. By now you must realize that the K/G/M barges did not stick to one barge per day! One barge per day was K/G/M's deal with WSDOT, in the FEIS, and I assume was K/G/M's deal with Ecology.
Thank you. Best, Ann Hurst, 6302 NE 151st Street, Kenmore, WA 98028

From: annmhurst@msn.com
To: c4sep@yahoogroups.com; stedward@lists.riseup.net; nlccannouncements@yahoogroups.com
Date: Wed, 24 Oct 2012 09:09:41 -0700
Subject: [stedwards] Dioxin Levels Love Canal, Vietnam, No Kiewitt skin in game?

To give you an idea of how 90 pptr in Kenmore sediments compares to the most egregious Vietnam contamination and Love Canal:

The U.S. will spend $68 million to clean up Vietnam dioxin hot spots due to leaching of Agent Orange from dioxin storage sites:

"The general standard in most countries is that **dioxin levels must not exceed 1,000 ppt (parts per trillion) TEQ (toxic equivalent) in soil and 100 ppt in sediments**. Levels beyond that require immediate remediation. Average dioxin contamination in the soil of industrialized nations is less than 12 ppt." At Harbour Village Marina, the Dioxin level of **90 pptr** in sediments should have triggered further investigation as the number is approaching the 100 ppt that requires immediate remediation. See source: http://www.aspeninstitute.org/policy-work/agent-orange/cleaning-dioxin-contaminated-soils

The 13.2 pptr in the sediments of the Kenmore Navigation Channel is not approaching 100 ppt but it is above the threshold of 10 ppt which requires during clean-up that it be treated as a hazardous substance and not allowed to disperse into Lake Washington. Clearly it has been allowed to disperse with barge traffic. The City of Kenmore, perhaps WSDOT, could seek damages from K/G/M.

By comparison, Love Canal had 380 pptr just in the fly ash. Fly ash is a product that in March wafted from the fly ash flue of Cal Portland in Kenmore; while it is unlikely that the recent source of fly ash used by Cal Portland is a by product of burning toxic wastes, prior fly ash sources could well have been a result of burning materials that would create a by-product with heavy dioxin contamination. Fly ash has been used at the batch plant for decades to create cement products.

Love Canal surface water sediments measured 37 ppb – perhaps someone can translate into pptr, the storm sewer sediment of Love Canal was 672 ppm, and six private sump pumps next to the industrial garbage dump measured as high as 16,500 ppm. A clear picture of the source, a dump.

Kenmore is not Love Canal, yet we are nearing the immediate remediation point at Harbour Village Marina and the source needs to be found and contained.

We are only one of four states that does not consider absorption of Dioxin through the skin to be hazardous in particular situations: "For dioxin, incidental ingestion is the dominant exposure route for unrestricted/ residential use, and four states (Delaware, Mississippi, Pennsylvania, and Washington) base their cleanup levels on this pathway alone. Most others incorporate inhalation and/or dermal exposures, but those contributions tend to be relatively small. However, under certain scenarios (such as for excavation workers), these additional exposure routes can contribute substantially to the derived cleanup level." P.19
REVIEW OF STATE SOIL CLEANUP LEVELS FOR DIOXIN, 2009

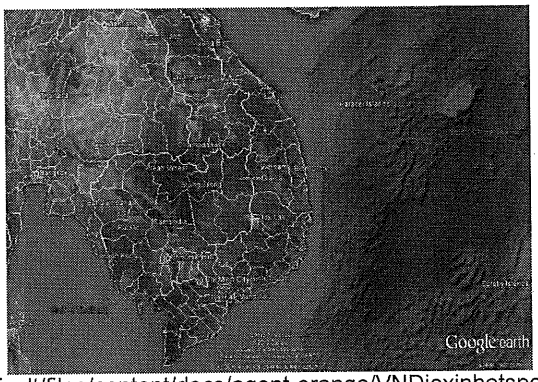
THE ASPEN | INSTITUTE

GO→

EXPLORE THIS PROGRAM
AGENT ORANGE IN VIETNAM PROGRAM

Hot Spots: Cleaning Up Dioxin-Contaminated Soils

- Download the Hot Spots fact sheet (/sites/default/files/content/docs/agent-orange/4AOVIIFactSheet-HotSpots-CleaningUpDioxin-ContaminatedSoils-Aug2011.pdf)



(http://www.aspeninstitute.org/sites/default/files/content/docs/agent-orange/VNDioxinhotspots.kmz)

Click on the image to launch a Google Earth interactive display (http://www.aspeninstitute.org/sites/default/files/content/docs/agent-orange/VNDioxinhotspots.kmz) of known and potential dioxin "hot spots" in Vietnam from the use of toxic herbicides. Created by the War Legacies Project (http://warlegacies.org/AgentOrange.htm), the map is based on research conducted by Hatfield Consultants (http://www.hatfieldgroup.com/default.aspx?p=/services/contaminantagentorange/agentorangereports) and their Vietnamese counterparts at the 10-80 Committee. Their research was funded by the Ford Foundation through a grant to the Ministry of Health in 2002. (Also available for Google Maps (https://maps.google.com/maps/ms?msid=216825182915981157584.000482fa653aa3fa51b4e&msa=0&ll=12.259854,115.433849&spn=22.281692,43.286133))

Agent Orange/dioxin residues in Vietnam can be and are being cleaned up, using well-known and cost-effective methods. Additional resources would allow scale-up and expansion of these best practices to all existing "hot spots." Dioxin-contaminated herbicides were sprayed over about 5 million acres of upland and mangrove forests and about 500,000 acres of crops -- a total area the size of Massachusetts, about 24 percent of southern Vietnam. Some areas of Laos and Cambodia along the Vietnam border were also sprayed. Dioxin is not water-soluble. It breaks down in sunlight or clings to soil particles and is washed away in rainwater, so little remains in areas that were sprayed by air.[i] However, Hatfield Consultants (Canada) has found "hot spots" of high dioxin concentrations in areas where the dioxin-contaminated herbicides were stored, leaked or spilled. These are mostly on and around former U.S. military installations. Dioxin leached into the soil or was transported by runoff into the sediments of nearby rivers, lakes and ponds.

About Hot Spots: Research continues, but as of August 2011, Hatfield and Vietnamese officials had located 28 dioxin hot spots, primarily where the Ranch Hand program was based. The most significant are at the Da Nang, Phu Cat and Bien Hoa airports that were used by the U.S. military.[ii] Safety standards for dioxin vary from country to country and by substance tested: food, air, water or soil. As most exposure to dioxin is through the food chain, the greatest concern for human exposure is the dioxin level in soil and sediment.

- The general standard in most countries is that dioxin levels must not exceed 1,000 ppt (parts per trillion) TEQ (toxic equivalent) in soil and 100 ppt in sediments. Levels beyond that require immediate remediation. Average dioxin contamination in the soil of industrialized nations is less than 12 ppt.
- In Vietnam, researchers found dioxin levels of up to 365,000 ppt at Da Nang, 262,000 ppt on the Bien Hoa base and 236,000 ppt in former storage areas on the Phu Cat base.[iii]

Hot Spots Cleanup: The U.S. Agency for Toxic Substance and Disease Registry has determined that dioxin levels higher than 1,000 ppt in soil require intervention, including surveillance, research, health studies, community and physician education, and exposure investigation.[iv] The first step is to prevent access to contaminated areas by constructing fences and other barriers to protect the local population from further exposure. Second, containment measures such as concrete caps, filtration systems and sediment traps can prevent dioxin from being transported to secondary sites such as ponds and streams, and from there up the food chain to people. Then the isolated soils can be cleaned of dioxin through appropriate technical means.

Dioxin cleanup: The cost of cleanup depends on the severity of the contamination, the type of soil affected and later uses planned for the area. Hatfield Consultants and its Vietnamese counterpart,

Office of National Steering Committee 33, estimate that a total of 234,780 cubic meters of soil and sediment need remediation at Bien Hoa, Da Nang and Phu Cat, the worst known sites – enough material to cover a football field nine feet deep. In mid-2010, the UNDP/Global Environmental Fund estimated the remediation cost for all three sites at

$58.7 million.[v] In mid-2011 the cost to clean up the dioxin at the Da Nang airport increased from an earlier estimate of $34 million to $43 million, bringing the total estimated costs for the three dioxin hotspots to $67.7 million.

Actions by Vietnam and the United States: In 2003, the U.S. Environmental Protection Agency began a $2.4 million project in cooperation with the Vietnamese to investigate the situation at Da Nang, funding U.S. government agencies and their contractors. In 2007, the Joint Advisory Committee of U.S. and Vietnamese agencies began holding yearly meetings. In the same year, Congress allocated $3 million to address remediation of dioxin hotspots in Vietnam and to support public health programs in the surrounding communities.[vi] A second allocation of $3 million was included in the FY2009 Foreign Operations spending bill, and a third allocation of $15 million, substantially increasing U.S. government support, was approved for FY2010. In April 2011, Congress approved $18.5 million for FY2011, of which $3 million was specifically reserved for health activities. The U.S. Agency for International Development (USAID) has disbursed $3 million from Congressional appropriations in 2007, 2009 and 2010 to three non-governmental organizations for programs to support those with disabilities in the Da Nang area over the period 2008-2011. USAID is expected to increase that level to $3 million/year from 2012. In October 2009, USAID allocated $1.69 million to a U.S. engineering firm to assess dioxin contamination there and design a remediation plan. In October 2010, Secretary of State Hillary Clinton announced U.S. government support for a project to clean up the Da Nang hot spot which is now costed at $43 million.[vii]

NGO Activities: The lead NGO has been the Ford Foundation, which through April 2011 provided $17.1 million in grants in Vietnam to test for and contain dioxin-contaminated soils, develop treatments and support centers for Vietnamese who have been exposed, restore landscapes, and educate the U.S. public and policymakers. Ford has also worked to increase awareness about Agent Orange/dioxin among donors and to encourage new donors such as UNICEF, UNDP, The Atlantic Philanthropies and the Bill & Melinda Gates Foundation. In May 2011 the Ford initiative on Agent Orange transited to the Aspen Institute. Many U.S. and Vietnamese NGOs have projects that provide services to the disabled in Vietnam.

For More Information Contact: James Hoppes at the Aspen Institute Agent Orange in Vietnam Program, 477 Madison Avenue Suite 730 New York, NY 10022. james.hoppes@aspeninstitute.org (mailto:james.hoppes@aspeninstitute.org), 215 887-3815.

August 2011

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[i] Dwernychuk, Wayne et al. "The Agent Orange Dioxin Issue in Vietnam: A Manageable Problem." Paper Presented at Dioxin 2006, Oslo, Norway http://www.warlegacies.org/OsloPaper2006.pdf (http://www.warlegacies.org/OsloPaper2006.pdf).

[ii] Vo Quy, "Statement to the House Subcommittee on Asia, the Pacific and Global Environment," Washington DC, June 4, 2009, http://www.internationalrelations.house.gov/111/quy060409.pdf (http://www.internationalrelations.house.gov/111/quy060409.pdf).

[iii] Committee 33 PowerPoint Presentation: "Overcoming consequences of toxic chemicals/dioxin: A difficult and long-term task." April 2009 http://www.warlegacies.org/Committee33_0209.pdf (http://www.warlegacies.org/Committee33_0209.pdf) and Office of the National Steering Committee 33, Ministry of Natural Resources & the Environment, and Hatfield Consultants, "Environmental and Human Health Assessment of Dioxin Contamination at Bien Hoa Airbase, Vietnam," July 2011.

[iv] Hatfield Consultants "Summary of Dioxin Contamination at Bien Hoa, Phu Cat and Da Nang Airbases, Viet Nam." PowerPoint presentation for the meeting of the U.S.-Vietnam Dialogue Group On Agent Orange/Dioxin, Washington, DC June 2009. http://www.warlegacies.org/Hatfield-Dioxin-Presentation-DC-052809.pdf (http://www.warlegacies.org/Hatfield-Dioxin-Presentation-DC-052809.pdf).

[v] Committee 33 PowerPoint Presentation: "Overcoming...

[vi] Michael Martin, "Vietnamese Victims of Agent Orange and U.S.-Vietnam Relations" Congressional Research Service Report. (May 2009) p. 9 http://www.warlegacies.org/CRSAO.pdf (http://www.warlegacies.org/CRSAO.pdf)

[vii] $500,000 is being used to finance a staff person for dioxin issues at the U.S. embassy in Hanoi and for more expert exchanges.

Comment #4

O'Brien, Maura (ECY)

From: Dennis mendrey [dennism@riserealtyllc.com]
Sent: Wednesday, October 24, 2012 11:02 AM
To: O'Brien, Maura (ECY)
Subject: RE: Webpage and media information for Kenmore Industrial Park site and Harbour Village Marina

Sound great!

Working together for a better Kenmore.

Dennis

RISE REALTY LLC
6410 NE 182 St
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dennism@riserealtyllc.com
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From: O'Brien, Maura (ECY) [mailto:MOBR461@ECY.WA.GOV]
Sent: Monday, October 15, 2012 11:13 AM
To: Dennis mendrey; Clyde Merriwether; elizabeth.mooney@comcast.net; happyhaze@msn.com; Ann Hurst; Cindy Beckett; patrickeobrien@comcast.net
Cc: nousley@ci.kenmore.wa.us; Greg Wingard
Subject: Webpage and media information for Kenmore Industrial Park site and Harbour Village Marina

SEDIMENT SAMPLING & ANALYSIS PLAN COMMENT PERIOD Kenmore Area Sediment & Water Characterization – Oct 15-29, 2012

Ecology is holding a two week informal public comment period for the citizens of the Kenmore Area for the proposed Sediment Sampling and Analysis Plan at the Kenmore waterfront area. The Washington Department of Ecology with the full cooperation of the City of Kenmore are working in close consultation with the Washington State Department of Health (DOH) and Dredged Materials Management Program (DMMP) on the details for the Sediment Sampling and Analysis Plan (SSAP). The SSAP will include near shoreline sediment sampling at Log Boom Park, Lake Washington northeast waterfront, Harbour Village Marina, North Lake Marina, offshore of the Kenmore Industrial Park site, Kenmore Navigation Channel and Sammamish River, and water column samples at Log Boom Park. Final access arrangements have been completed.

The draft SSAP will be available for informal public review from October 15 – 29, 2012. This is not a formal state cleanup requirement (Model Toxics Control Act) for public involvement. Your review and comments are requested and please send written or email comments to Maura O'Brien at mobr461@ecy.wa.gov or Department of Ecology, 3190 – 160th Ave SE, Bellevue, WA 98008. Ecology, the City, DOH, and DMMP will review all comments received and finalize the SSAP.

SAMPLING SCHEDULE
Sampling is scheduled for early November, preliminary sediment and water column sampling results are estimated to be received in December, and a draft report with these results are estimated to be available in January 2013. This schedule is subject to change due to unforeseen circumstances, such as equipment availability and weather conditions.

Comment # 5

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

Caring for
your natural resources
... now and forever

October 22, 2012

Maura O'Brien, Toxics Cleanup Program NWRO
Washington State Department of Ecology
3190- 160th Ave SE
Bellevue, WA 98008

Re: Draft Sampling and Analysis Plan, Kenmore Sediment and Water Characterization

Dear Ms. O'Brien:

The Washington State Department of Natural Resources (DNR) would like to thank you for the opportunity to comment on the Draft Sampling and Analysis Plan for the Kenmore Sediment and Water Characterization.

DNR's comments are based on principles of stewardship and proprietary management derived from our legislative defined goals to protect State-Owned Aquatic Lands (SOAL) and preserve them for the public's benefit. We appreciate Ecology's consideration of these and any future comments related to the characterization of these sediments.

First, in Table 1, please note that DNR does not own state owned aquatic land-it is the manager of those lands.

Secondly, since the freshwater sediment standards are draft and are still being revised, they should not be the sole standards the nearshore samples should be screened against. (p. 27)

Sincerely,

Erika A Shaffer, MS
Aquatics Division, Sediment Specialist

Comment #6

North Lake Marina

6201 NE 175TH St, Kenmore, WA. 98028
P#425.482.9465 F# 425.482.9386
www.northlakemarina.com

October 25, 2012

City of Kenmore
Rob Karlinsey
Nancy Ousley
18120 68th Ave. NE
Kenmore, WA. 98028

Department of Ecology
Maura O'Brien
3190 160th Ave. SE
Bellevue, WA. 98008

Re: *Sampling and Analysis Plan Kenmore Area Sediment and Water Characterization*

Mr. Karlinsey, Ms. Ousley, and Ms. O'Brien,

We have reviewed the Sampling and Analysis Plan (the "Plan"). Please correct the Plan at page 3, second paragraph. The owner of North Lake Marina (Johnson & McLaughlin, LLC) is not participating in the Plan; rather, the property owners are the participating parties. It is our understanding Clifford Davidson has been working with the City, as a representative of Davidson Investment Properties, LLC, and Bernie Talmas, as Edwin Davidson's representative, spoke before the City Council at an open City Council meeting as to Mr. Davidson's intent to participate. North Lake Marina has agreed to facilitate any needed access and to provide moorage at no cost for the testing vessel. Please contact the undersigned if you have any questions concerning this letter.

Thank you,

Lori Johnson
North Lake Marina
Johnson & McLaughlin, LLC

Loren McLaughlin
North Lake Marina
Johnson & McLaughlin, LLC

Comment #7

Comments on the Sediment Sampling and Analysis Plan – Kenmore Area Sediment and Water Characterization

October 26, 2012

Prepared by:

Greg Wingard
PO Box 4051
Seattle, WA 98194-0051

Section 1.1

The Kenmore Navigation Channel (KNC) appears to terminate, adjacent to Kenmore Air. What is the status of the remaining portion of the head of the channel to the NE? Who owns it, and can it be sampled as well?

From our recent meeting, it is my understanding that the sediments at the head of the channel, northeast of and adjacent to the Kenmore Navigation Channel are in private ownership. Further, Ecology and/or the City of Kenmore have approached these property owners, including Kenmore Air, CalPortland, and Kenmore Industrial Park, who have declined to allow sampling of these in channel sediments as part of this SSAP project.

There is a high level of community concern about the potential contamination of the sediments in this area, and the head of the channel. This is based on available information such as present and former industrial uses, a fairly substantial fire involving creosoted timber, the sinking of a tug, which released at least some amount of product/waste (according to the United States Coast Guard), to list a few.

Sampling of these sediments is a high priority in the community, with a strong preference to see this sampling done sooner, rather than later. This concern is particularly critical due to the increased tug and barge traffic in this vicinity, which as been seen causing an increase in water turbidity, from the disturbance of channel sediment from prop wash.

While I understand there are some legal limits to what Ecology can do, or require a private property owner to do, I also want to be very clear that based on a reasonable assessment of the available information there is a strong community concern that sediments in the channel head, outside the KNC, may be contaminated, are being disturbed, and may be distributed as a result. Resolution of this data gap is a critical community issue that needs to be a high priority with Ecology, and Kenmore.

According to the plan this "screening level" study will be followed by a full DMMP characterization when the proposed funding for the project is two years or less out. There is some uncertainty in the proposed time lines here. Any information Ecology/Kenmore can provide on timing of further sampling after the initial screening is completed would be useful. My current understanding is that this is dependent to a large extent on federal funding/permission being available for the KNC dredge project. The assumed target date is currently thought to be between two and four years out, with substantial additional sediment data collection being done in that time frame.

The community requests that Ecology deal with this issue, of the time frame and potential scope of additional sampling concurrent with the release of data and reports resulting from this SSAP. By addressing this matter up front and as soon as possible Ecology/Kenmore can reassure the community of your commitment to collect the necessary data to see that community health and the environment of the north Lake Washington, and related near shore area is protected.

The document states the owners of Northlake Marina are interested in coordinating their dredging project, in conjunction with the KNC dredge to optimize potential cost savings. How does this fit in with the potential dredging at the Harbor Village Marina?

It would appear that given the somewhat closely coordinated approach and timing of the dredging at each of these three sites, that particular attention should be paid to the potential for any nexus between the sites. The current sampling design does not appear to meet this objective, as there appear to be remaining data gaps in the area east of the Harbor Village Marina, north and west of the KNC, and at the head of the channel north and east of the KNC.

My understanding is that Ecology/Kenmore are investigating the possibility of moving some sampling locations to address this issue to some extent, but that there is a lack of additional funds to allow for more sampling locations to be added.

The community requests that Ecology meet with the community as soon as possible after the data from this SSAP is released to discuss a data gaps analysis, including an assessment of what the additional priorities for sampling will be, and timing of further sampling efforts.

A substantial amount of both public and private funds will be expended in dredging, or corrective actions for the identified dredge project, or known contaminated site areas. The understanding of the potential contamination nexus between these proposed project areas, as well as additional nearby areas needs to be understood, and the potential for recontamination known and addressed prior to dredging or removal actions.

Section 1.2

The exact purpose of the water sampling is not clear. The primary chemicals of concern from the community perspective are the dioxin/furan/PCB's, and metals, in particular at Log Boom Park, as the park is closely adjacent to the known dioxin/furan/PCB contamination at the Harbor Village Marina. It is highly unlikely that these particular chemicals of concern would be found dissolved in the water column. The more likely scenario is that the water column would be contaminated by sediment stirred up by human, or mechanical activity. To the extent there is a risk to public health from the water column absent disturbed, suspended sediments, based on available data to date, it is much more likely that health risk would relate to biological constituents (pathogens), rather than chemicals of concern, such as dioxin/furans/PCB's and metals.

It does not appear that the water quality samples add much value to this sampling effort. If the expense related to the proposed water quality sampling is equal to, or greater than the cost of an additional sediment sample (my understanding is that the loaded cost of adding another sediment sampling location is ~$2,200), then Ecology/Kenmore should strongly consider scrapping the water quality sampling and instead adding an additional sediment sample(s), in one of the available areas where more data would be useful. A potential priority would be the area to the east of the current Harbor Village Marina samples.

Section 1.2 (sic)

There are clearly multiple purposes related to this sampling effort. In terms of sampling collection methods and analysis, these should be as homogenous as possible between all sampling locations, so as to maximize the potential statistical and comparative use of the data across the entire area sampled. It is not clear from this section how Ecology/Kenmore are going to optimize the statistical , and comparative usefulness of the sampling data. It is understood that there are some cost concerns/limitations that may impact aspects of this issue.

There is a reference to the revision of the Ecology sediment evaluation framework for freshwater, and that revision being available when published. The relevance to this SSAP is not clear. It is my understanding that the revised framework may be available in final form by the time the data from the SSAP project is available. If that is the case the consultant will use this updated document to screen the results against. The SSAP text of this will be clarified.

Section 1.3.1

Given the information about existing industries on, or in close proximity to the channel, the upper head of the channel, northeast of the KNC should be sampled as well. As this is discussed above, I will not repeat that information here.

Section 1.3.3

In the discussion of sediment loading the SSAP, provides specific citations related to sediment loading from stream 0056. In the discussion of the Sammamish River sediment loading and wind and wave transport, there are no citations provided, just a general assumption that the river is one of two primary contributory sources. Is there an available data on potential sediment loading from the River, or its sediment distribution?

It is understood that the current priority is to get the sampling underway. As a result, additional information of Sammamish River sediment loading to Lake Washington may wait until the data evaluation phase, rather than being included in the SSAP now. There is general agreement that additional information on Sammamish River sediment loading to Lake Washington will be useful.

In Ecology's recent update, "Harbour Village Marina", the site status and previous data are reported. This information is not referenced in section 1.3.3., of the SSAP.

In short the marina was already on Ecology's MTCA site list due to petroleum contamination, including soil and groundwater. The facility previously decided to deal with this site contamination through "natural attenuation." It has since been determined this petroleum contamination originated at an adjacent site, and Ecology's files are being updated to reflect this.

At the time the petroleum contamination was evaluated, data related to nearby dioxin/furan/PCB contamination was not known. There is potential concern that since petroleum at excessive levels has been located in the shallow groundwater at this facility, there may be a potential for the petroleum to impact nearby sediments. This is of concern as petroleum, in particular the lighter fractions of petroleum has the potential of mobilizing dioxin in soil, sediment, and water. Further consideration of this potential media/contamination nexus should be a high priority.

As mentioned above, given the historic information supplied in this report, and otherwise known about the CalPortland area, and the area outside of the KNC, referred to as the head of the channel, lack of samples from this area is a clear data gap. While it is understood that this area is private property, and neither Ecology or Kenmore have the immediate ability to collect samples on private property without property owner cooperation, plugging this data gap remains a top community priority.

Table 1

The table provides detail and rationale for selected sample locations. Near shore sediment samples are described as having a collection depth of 10 cm, and are collected with a trowel. Grab/box core samples are described as having a collection

depth of 25 cm. The difference in sample depth adds a variable that interferes with the ability to compare results from these two groups of samples. Sediment sample depths should be as consistent as possible across this sampling effort. From our recent meeting the issue of cost was raised as part of the rationale for differing sample depths, though how much impact having uniform sampling depth would have on the budget was not discussed in any detail.

As per previous comment, it is not clear what value the water sampling has in the context of this limited sampling plan, or how single point in time water samples would be that useful in terms of a health assessment given time loaded variability of water samples as compared to sediment samples.

Water analysis should include turbidity, as there is a specific water quality criteria for that parameter. From the meeting, it was clarified that turbidity sampling will be done as part of the conventional parameters taken at all the sample sites. The text will be modified so this information is consistent with the field sample forms at the end of the SSAP.

Figure 2

As mentioned previously given the proximity, and/or planned coordination between the three planned dredging, or cleanup projects (it is not clear whether Harbor Village Marina will proceed as a MTCA cleanup, or as a dredging project), the potential for a nexus between these three areas, the Harbor Village Marina, North Lake Marina, and KNC should be a priority of this and future sampling efforts. The sediment sampling as proposed does not address better defining the eastward lateral extent of sediment contamination from the presently known dioxin/furan/PCB contamination at the Harbor Village Marina. It does not address the potential for a nexus between that contamination and the eastward elbow of the KNC where current tug, and barge operations are at least in part making a turn and have been observed causing excessive turbidity in the water column. It also does not address the undesignated section of the channel between the northeastern extent of the DNC and the channel head, where according to the historic information supplied, some of the most likely potential sediment contaminant sources are, or were located. Ecology/Kenmore will investigate moving some of the sampling locations to address this issue, as long as that doesn't interfere too much with other data quality objectives.

Ecology mentioned in our recent meeting that the City of Lake Forest Park is siting a sediment sample in their area in addition to what was initially planned by Ecology and Kenmore. It is not clear if this sample is depicted in Figure 2.

Section 3.4

The section refers to the three planned water samples and says a single "background" sample will be collected upstream of the 68th Avenue bridge on the Sammamish River. How does this location constitute "background", as compared to Log Boom Park. Wouldn't it be preferable to take a water sample from the central part of north Lake Washington, and use that as background?

It seems the differences in the total volume of water, potential for inputs and other factors would make an upstream Sammamish River sample less than satisfactory for this purpose, and a sample from the middle of north Lake Washington would be more representative.

Ecology agreed to examine moving the "background" water quality sample, and will respond to this concern.

Section 3.4.1

The difference between grabbing a core sample and the trowel method of sampling has the potential to introduce an unnecessary variable in the sediment sampling methods. This includes a variable in the portion of sample based on depth for the trowel method, as compared to coring which would better isolate the sampled sediment and collect a more representative sample on the vertical axis to the depth sampled. Ecology agreed it is important to strictly control the sample collection to assure a representative sample is collected, and a sample collection call-out will be added to address this issue.

The rationale for the difference in sample depths is not clear. There should be some clear, consistent rationale for the sampling depth, such as the depth of contamination as seen at the Harbor Village Marina, or the depth of the biologically active zone, or the depth of planned dredging, or the depth likely to be disturbed by human contact or mechanical means. There should be at least some brief explanation of why there is a difference in sediment sampling depths.

Section 5

What is the rational for the difference in TBT sampling methodology between the near shore, and surface sediment samples?

In the KNC samples, and the Harbor Village Marina samples the TBT sample will be collected in the lab from the sample pore volume water, with bulk TBT sample analysis if enough pore water volume is not present in the sample. The rest of the collected samples will have bulk TBT sampling, apparently irrespective of whether there is enough pore water volume, or not. There should be at least a brief explanation for this variance in the sampling methodology.

Table 7

The schedule is of concern. As laid out in the schedule there will be a fairly long period of time between sample collection, and the issuance of the looked for reports from Ecology and Department of Health. It is understood that it is Ecology and Kenmore's intent to issue the data to the public as soon as the Quality Assurance/Quality Control step is completed. It is understood that this will be relatively "raw" data, without detailed explanations or conclusions, which will come later when the final reports are issued.

References

Under the Ecology citations, there is no reference to the Ecology sediment evaluation framework for freshwater. Does this mean Anchor is not using this as a reference in this SSAP?

The SSAP text will be modified to clarify under what circumstances the new framework will, or will not be used.

There is a reference of a personal communication between J. LaFlam and Bill Joyce in 2012. What is the substance of this communication and the significance of citing to it in the SSAP?

It is understood from the recent meeting that the J. LaFlam citation was a reference to a discussion between Kenmore staff, and the Kenmore Fire Department to collect additional information on the previous wharf fire of creosote treated timber, in the vicinity of the current CalPortland facility. Given the available information on this creosote timber fire, and the verification that at least a portion of the burnt and partially burnt treated timbers are still in the water and sediment in the channel adjacent to CalPortland, Ecology should likely add this site to the known and suspected contaminated sites list under MTCA authority. KAN will be discussing this in the near future, and may provide some additional input on this point.

Comment #8

O'Brien, Maura (ECY)

From: Kate Snider [Kate.Snider@floydsnider.com]
Sent: Monday, October 29, 2012 1:50 PM
To: O'Brien, Maura (ECY)
Cc: Wang, Ching-Pi (ECY); Gary Sergeant
Subject: Public comment on Sediment Sampling & Analysis Plan for Kenmore Area Sediment

Maura,

The following comments on the Sediment Sampling & Analysis Plan for Kenmore Area Sediment are provided on behalf of Gary Sergeant and Pioneer Towing, Inc.

1. Section 1.3.3, paragraph 5, page 9: Ecology's recent Public Participation Plan (PPP) update includes a description of the KIP site history that is more accurate than this description presented in the SAP. We would appreciate substitution of your text from the PPP. Most importantly, the 6th sentence regarding reported disposal of medical wastes and transformers should be deleted, as it is an old conjecture which has since been disproven.

2. Table 1: Our understanding is that sediment samples SG-14, SG-15, SG-16 and SG-17 will be on DNR aquatic lands property, offshore of KIP. Please confirm.

3. Figure 2 and Table 1: Throughout the year, significant sediment loads are conveyed out of the Sammamish River, and are deposited throughout the north end of Lake Washington. We are surprised that the proposed sampling plan does not include samples within the depositional area of the mouth of the Sammamish River, that would analyze this material as a potential source of contamination to the area. We recommend that approximately 2 sediment grab sample locations be added at (or relocated to) the centerline of the Sammamish River Small Boat Navigation Channel, south of SG-15 and in-between SG-16 and SG-17. In addition to the proposed SG-01, these sample locations could be used to characterize Sammamish River bed load as a potential source.

Please let Gary or I know if you have any questions.

Thanks,

Kate

Kate Snider, PE Principal
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From: O'Brien, Maura (ECY) [mailto:MOBR461@ECY.WA.GOV]
Sent: Monday, October 15, 2012 12:51 PM
To: Gary Sergeant; Kate Snider; Lakey, Kevin
Cc: Wang, Ching-Pi (ECY)
Subject: FW: Webpage and media information for the Sediment Sampling and Analysis Plan for the Kenmore waterfront area.

Hello,
Here is the Kenmore Area announcement and plan. The SSAP is posted both on the Ecology's Harbour Village Marina webpage and on the Kenmore Industrial Park site webpage.

Maura

SEDIMENT SAMPLING & ANALYSIS PLAN COMMENT PERIOD Kenmore Area Sediment & Water Characterization – Oct 15-29, 2012

Ecology is holding a two week informal public comment period for the citizens of the Kenmore Area for the proposed Sediment Sampling and Analysis Plan at the Kenmore waterfront area. The Washington Department of Ecology with the full cooperation of the City of Kenmore are working in close consultation with the Washington State Department of Health (DOH) and Dredged Materials Management Program (DMMP) on the details for the Sediment Sampling and Analysis Plan (SSAP). The SSAP will include near shoreline sediment sampling at Log Boom Park, Lake Washington northeast waterfront, Harbour Village Marina, North Lake Marina, offshore of the Kenmore

Industrial Park site, Kenmore Navigation Channel and Sammamish River, and water column samples at Log Boom Park. Final access arrangements have been completed.

The draft SSAP will be available for informal public review from October 15 – 29, 2012. This is not a formal state cleanup requirement (Model Toxics Control Act) for public involvement. Your review and comments are requested and please send written or email comments to Maura O'Brien at mobr461@ecy.wa.gov or Department of Ecology, 3190 – 160th Ave SE, Bellevue, WA 98008. Ecology, the City, DOH, and DMMP will review all comments received and finalize the SSAP.

SAMPLING SCHEDULE
Sampling is scheduled for early November, preliminary sediment and water column sampling results are estimated to be received in December, and a draft report with these results are estimated to be available in January 2013. This schedule is subject to change due to unforeseen circumstances, such as equipment availability and weather conditions.

Maura S. O'Brien, PG/HG #869
Professional Geologist/Hydrogeologist
Toxics Cleanup Program - NWRO
Department of Ecology
3190 - 160th Avenue SE
Bellevue, WA 98008-5452
Tele 425-649-7249
Fax 425-649-7098
Email mobr461@ecy.wa.gov

Comment #4

O'Brien, Maura (ECY)

From: Greg Wingard [gwingard@earthlink.net]
Sent: Monday, October 29, 2012 2:58 PM
To: O'Brien, Maura (ECY)
Subject: Re: SSAP meeting with Ecology

Maura:

My initial hope for the sampling approach was that at least the additional sampling in the Harbor Village Marina area would be consistent with the data group from the previous sampling there. I understand what that would do to the sampling budget.

Failing that, that the sample data collected as part of this SSAP project would be consistent enough across the sediment data set to allow for easy data comparison and statistical assessment of the data.

Even the deeper cores from the sediment data are fairly shallow in depth, under a foot (around four inches). The trowel samples at 10 cm, only close to four inches. Since these samples are essentially single composite samples per sample location, the difference in depth, and the very shallow nature of the near shore sediment sampling is troubling. Under four inches may not even accurately describe the depth which is likely to be disturbed in the near shore areas by human and mechanical activity, as my understanding is that much of this sediment is very soft muck.

As we discussed, it is my belief that it is important that we get additional data as soon as possible. There will also be some future data collection to address some of the shortfalls of this data set, including deeper samples at least in some locations (primarily associated with the dredging).

I tried to balance these concerns, benefits and short comings in my comments, but as you can tell remain concerned about the shallow nature of the samples, and the lack of identical sampling parameters between all sediment samples collected.

How much additional cost is involved in making all the samples 25cm? As the entire vertical profile, irrespective of depth is in essence a single composite per sample location, at the additional 15cm of vertical sampled sediment is not that much additional volume, it doesn't seem to me like there should be that much additional cost to simply collect 25cm of sample, across all sediment sampling locations.

Regards,

Greg

On 10/29/12 2:08 PM, O'Brien, Maura (ECY) wrote:

> Thanks Greg and I appreciate your efforts to get the SSAP comments to me early.
>
> I am working on them.
>
> Maura

Maura S. O'Brien, PG/HG #869
Professional Geologist/Hydrogeologist
Toxics Cleanup Program - NWRO
Department of Ecology
3190 - 160th Avenue SE
Bellevue, WA 98008-5452
Tele 425-649-7249
Fax 425-649-7098
Email mobr461@ecy.wa.gov

> **From:** Greg Wingard [mailto:gwingard@earthlink.net]
> **Sent:** Saturday, October 27, 2012 9:50 PM
> **To:** O'Brien, Maura (ECY)
> **Subject:** Re: SSAP meeting with Ecology
>
> Maura:
>
> My last message bounced back for some reason, a problem I have occasionally with Ecology email addresses.
>
> You mentioned you wanted my comments prior to the Monday deadline if possible.

I would have spent a bit more time on edits and such, but given I am going to be gone all day tomorrow, if I don't get them out now, it will be Monday before I have a chance to send them.

Here they are.

Regards,

Greg

On 10/25/12 5:20 PM, O'Brien, Maura (ECY) wrote:

> Thank you Greg for the opportunity to meet with you and discuss comments about the proposed Sediment SSAP.
>
> I appreciate your insights and working together and then we will have a clearer sampling plan and together get the job accomplished as best we are able, and will limited funds.
>
> Yes the City of Lake Forest Park now, has requested to add one sediment and water column samples off their park shoreline.
>
> I look forward to receiving your written comments by Monday, Oct 29 and earlier if feasible as I will be working on the SSAP this Sunday.
>
> Maura
>
> Maura S. O'Brien, PG/HG #869
> Professional Geologist/Hydrogeologist
> Toxics Cleanup Program - NWRO
> Department of Ecology
> 3190 - 160th Avenue SE
> Bellevue, WA 98008-5452
> Tele 425-649-7249
> Fax 425-649-7098
> Email mobr461@ecy.wa.gov

Comment #10

Mayor
Mary Jane Goss

17425 Ballinger Way NE
Lake Forest Park, WA 98155-5556
Telephone: 206-368-5440
Fax: 206-364-6521
E-mail: cityhall@ci.lake-forest-park.wa.us
www.cityoflfp.com

10/25/2012

Ms. Maura O'Brien
Department of Ecology
3190 160th Ave NE
Bellevue, WA 98008

Dear Ms. O'Brien,

Thank you for meeting with City staff to discuss the Kenmore waterfront area sediment sampling and analysis plan (SSAP). As you know, the presence of chemicals and potential presence of contamination in Lake Washington sediments is an issue of serious concern for the City of Lake Forest Park.

The proposed SSAP does not provide for sampling in Lake Forest Park despite the close proximity (~2400') of the Lake Forest Park Waterfront Park and the Civic Club to the proposed sampling area. Each of these facilities provides access to Lake Washington while the Civic Club has a popular swimming area. There are also 29 residences on the lake between Log Boom Park and Waterfront Park.

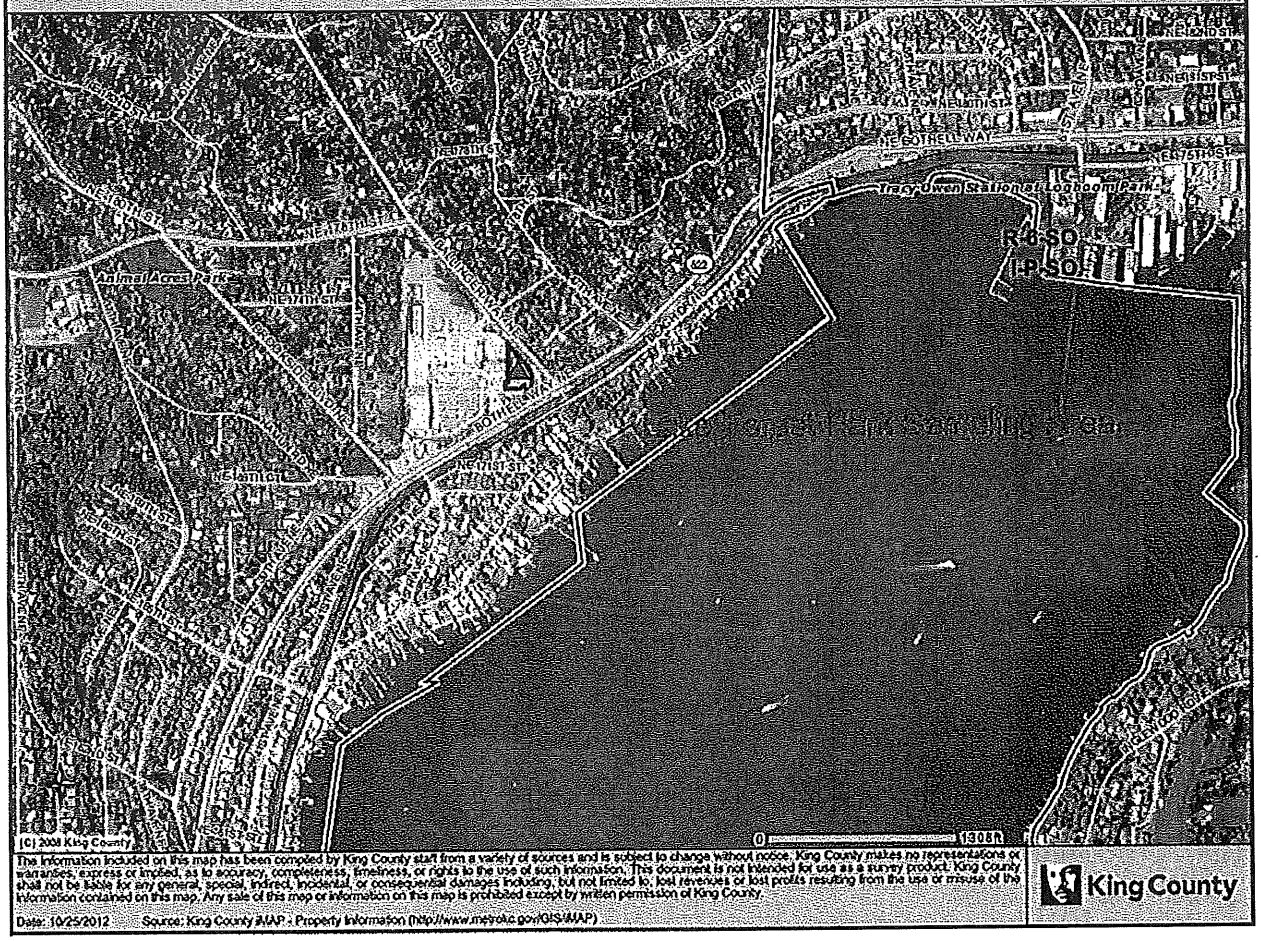
We understand that the rationale for not sampling in Lake Forest Park is based on the Kenmore Lake Line Lakebed Sedimentation Analysis study that indicates the migration of sediment is predominately to the northeast. If this were true, sediment on the Lake Forest Park waterfront would travel toward Kenmore. Unfortunately, this has not been our experience. In fact, seasonal changes in sediment migration have been observed with sediment migrating, at times, in the southwest direction taking sediment from the Kenmore waterfront area into Lake Forest Park.

As a result, the City respectfully requests that a sediment grab sample and a water sample be taken between the Lake Forest Park Waterfront Park and the Civic Club as part of the Kenmore Waterfront area SSAP. See the attached map to better understand the area. Please contact Aaron Halverson, Environmental Programs Manager at (206) 957-2836 or ahalverson@ci.lake-forest-park.wa.us if you have comments or questions.

Sincerely,

Mary Jane Goss
Mayor

Lake Forest Park Sampling Map



King County

Date: 10/25/2012 Source: King County iMAP - Property Information (http://www.metrokc.gov/GIS/iMAP)

Comment # 11

O'Brien, Maura (ECY)

From: elizabeth.mooney@comcast.net
Sent: Monday, October 29, 2012 7:55 PM
To: O'Brien, Maura (ECY)
Cc: Elizabeth Mooney; Janet and Bob Hays; Ann Hurst
Subject: Sediment and Water Sampling Plan Kenmore: ERTS Information 632786 (UNCLASSIFIED)

October 28, 2012

Maura O'Brien
Dept of Ecology

Comment regarding Sediment and Water Anaylysis Kenmore:

Dear Maura,

I am sending this email chain as evidence in support of my argument that the truth was not upheld, nor our laws abided by, nor our agencies able to support my ERTS call by enforcing the water quality laws that are supposed to protect our public right to Clean Water. The record was never corrected. I have called Coast Guard, WSDOT, DOE regarding this email.

The point is that the barging operation for SR 520 continues, the companies do the work, the waters and sediment have not been tested and the barge grounding and contaminated water (turbidity) was never admitted to have occurred.

I believe this in evidence that the project has not been abiding by the laws intended to protect our environment. Calportland is part of the team and is not allowing DOE to test the sediment in front of their property at the bottom of the lake. Why wouldn't they? We do not know the source of the dioxins that were found in high levels at Harbour Village Marina in October 2011. Since this behavior of denying a grounding occurred when in fact it did is an indicator that the companies and WSDOT and the contractors were not admitting to a grounding when in fact it occured, how can we trust without DOE testing that this is not the source of the high level of dioxins? There is a wharf that burned and that is in the lake. Burning wharfs might be a source of dioxins. This is good reason to have Calportland, to let their area be tested before it has more barges push in and out of the head of the channel.

I have seen the turbidity caused by the incident Greg Wingard observed flow (brown water) into Harbour Village Marina. I stood at Harbour Village Marina and talked to its harbormaster Mike, while watching the brown water in the marina as it contrasted with the blue water further out in the lake.

I can only assume that the barging that has been ongoing may have contributed to translocation of sediments. If you or WDFW need proof, the agencies would have had to test first, measured, and had a baseline from which to compare.

I hope the Calportland site will offer to let DOE test, but, regardless, I would hope one day to receive a letter that states that this email was in error. I have heard that WSDOT admitted they grounded during the ERTS 632786 incident, but I haven't seen a letter to correct this email message.

Elizabeth Mooney

From: "David R NWS Kendall" <David.R.Kendall@usace.army.mil>
To: "Elizabeth Mooney" <elizabeth.mooney@comcast.net>
Cc: "Clay Keown (ECY)" <ckeo461@ECY.WA.GOV>
Sent: Thursday, March 29, 2012 3:13:20 PM
Subject: RE: ERTS Information 632786 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Elizabeth: FYI, I got this email communication from John Hicks (Chief/Navigation), regarding tug movements/turbidity in Kenmore Channel. The Tugboat operator's email (see email string below) to USCG discusses their activity and indicates that there were no groundings.

I have no interest in getting in the middle of this, but wanted to let you

know that the USCG investigated the complaints about the turbidity.

David

David R. Kendall, Ph.D.
Chief, Dredged Material Management Office

Seattle District Corps of Engineers
Phone: 206/764-3768
Fax: 206/764-6602
email: david.r.kendall@usace.army.mil

- FYI-see below

John A. Hicks
Chief, Navigation Section
Army Corps of Engineers, Seattle District
4735 E. Marginal Way S
Seattle, WA 98124-2255
(206) 764-6908- Telephone
(206) 595-2750- Cell
(206) 764-3308- Fax
john.a.hicks@usace.army.mil

-----Original Message-----
From: Heather.J.St.Pierre@uscg.mil [mailto:Heather.J.St.Pierre@uscg.mil]
Sent: Monday, March 26, 2012 11:23 AM
To: Hicks, John A NWS
Subject: FW: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Hi John,

I've attached the e-mail string to keep you posted. Let me know if you hear anything else about the Kenmore area.

Take care,

Heather

LCDR Heather St. Pierre
Chief, Waterways Management Division
U.S. Coast Guard Sector Puget Sound
1519 Alaskan Way South
Seattle, WA 98134-1192
206-217-6042
heather.j.st.pierre@uscg.mil

-----Original Message-----
From: EEdwards@mansonconstruction.com
[mailto:EEdwards@mansonconstruction.com]
Sent: Sunday, March 25, 2012 8:43 AM
To: St.Pierre, Heather LCDR; Overton, Randall; LaBoy, Anthony ENS
Cc: Monica Blanchard; Jessi Massingale; andy.hoff@kiewit.com;
Frank.Young@kiewit.com; Erik.Nelson@kiewit.com; Ron.Wika@kiewit.com;
Robert.Brenner@kiewit.com
Subject: RE: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Good morning LCDR Heather St. Pierre- Island Tug and Barge (ITB) uses the slip and North dock to berth a gravel barge for Cal Portland Concrete Company. ITB typically shifts in and out of the slip on a twice per week schedule. KGM coordinates this with both Cal Portland and ITB to verify we do not interfere with their schedule.

KGM looks forward to working with USCG, USACE and Lake Washington stakeholders to assure a safe and successful completion to the SR520 project.

Regards,
Eric

Description: KGM_logo.gifEric Edwards

Marine Assembly Manager | Kiewit/General/Manson, A Joint Venture

SR 520 Evergreen Point Floating Bridge

3015 112th Ave N.E., Suite 100 Bellevue, WA 98004

(p) 425-576-7081 | (c) 510-773-6934

From: Heather.J.St.Pierre@uscg.mil [mailto:Heather.J.St.Pierre@uscg.mil]
Sent: Saturday, March 24, 2012 8:07 AM
To: Eric Edwards; Overton, Randall; LaBoy, Anthony ENS
Cc: Monica Blanchard; Jessi Massingale; andy.hoff@kiewit.com; Frank.Young@kiewit.com; Erik.Nelson@kiewit.com; Ron.Wika@kiewit.com; Robert.Brenner@kiewit.com
Subject: RE: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Good Morning Mr. Edwards,

Thank you for your quick response and additional details. Are there other tugs or companies that are using the facility as moorage? We may follow up with you if we have any questions as the bridge pontoon project becomes more active in the immediate area, and will be so for quite some time, so we appreciate your response and assistance. Best of luck on the project.

Regards,

LCDR Heather St. Pierre
Chief, Waterways Management Div.
USCG Sector Puget Sound
Sent with Good (www.good.com)

-----Original Message-----
From: Eric Edwards [EEdwards@MANSONCONSTRUCTION.COM]
Sent: Friday, March 23, 2012 09:51 PM Eastern Standard Time
To: Overton, Randall; St.Pierre, Heather LCDR; LaBoy, Anthony ENS
Cc: Monica Blanchard (MBlanchard@MansonConstruction.com); Jessi Massingale; andy.hoff@kiewit.com; Frank.Young@kiewit.com; Erik.Nelson@kiewit.com; Ron.Wika@kiewit.com; Robert.Brenner@kiewit.com
Subject: RE: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Good Evening-

Kiewit- General- Manson (KGM) was conducting operations at our Kenmore dock facility with the Derrick Barge 24 and Tug Nancy M on both Tuesday (3-20-12) and Wednesday (3-21-12). The entrance channel and slip at Kenmore have approximately 14-18ft of water depth. DB24 drafts 7ft and Tug Nancy M drafts 11ft. No grounding or bottom disturbance occurred during the operations.

KGM has been and will continue to coordinating with all the stakeholders in the industrial park who are: Kenmore Air, Cal Portland and Lakeshore Construction to assure we do not block access to the waterway.

I would be happy to discuss this issue in further detail at your convenience. Please don't hesitate to call or write if further information is required.

Kind regards,

Eric Edwards
Marine Assembly Manager | Kiewit/General/Manson, A Joint Venture SR 520 Evergreen Point Floating Bridge
3015 112th Ave N.E., Suite 100 Bellevue, WA 98004
(p) 425-576-7081 | (c) 510-773-6934

-----Original Message-----
From: Monica Blanchard
Sent: Friday, March 23, 2012 5:17 PM
To: Eric Edwards
Subject: Fw: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

---
Sent using BlackBerry

Note: This message was sent from my mobile phone.

----- Original Message -----
From: St.Pierre, Heather LCDR [mailto:Heather.J.St.Pierre@uscg.mil]
Sent: Friday, March 23, 2012 05:08 PM
To: Monica Blanchard
Cc: jessi.massingale@floydsnider.com <jessi.massingale@floydsnider.com>; Overton, Randall <Randall.D.Overton@uscg.mil>; LaBoy, Anthony ENS <Anthony.P.Laboy@uscg.mil>
Subject: SR 520 Bridge Project - Tugs and Crane Barge in Kenmore

Good Afternoon,

The USCG (Sector Puget Sound) and USACE received a report today that some citizens were concerned about tugs and crane barges involved in the SR 520 bridge project at the Kenmore Industrial Park. It was reported that tugs and crane barges involved in this project were grounding and disturbing bottom sediments to subsequently refloat the barges. This was believed to have caused shoaling in other nearby areas and impacting other waterway users and the navigability of the surrounding area.

If one of the towing vessels or if a certificated barge has grounded, this information must be reported to the Coast Guard as well.

We ask for your cooperation in working with us as well as the other waterway users in the area. If you have any questions, please let us know.

Regards,

LCDR Heather St. Pierre
Chief, Waterways Management Division
U.S. Coast Guard Sector Puget Sound
1519 Alaskan Way South
Seattle, WA 98134-1192
206-217-6042
heather.j.st.pierre@uscg.mil

-----Original Message-----
From: Elizabeth Mooney [mailto:elizabeth.mooney@comcast.net]
Sent: Thursday, March 29, 2012 11:08 AM
To: Ann Hurst
Cc: <gste461@ecy.wa.gov>; <happyhaze@msn.com>; <patrickeobrien@comcast.net>; <mobr461@ecy.wa.gov>; <cwan461@ecy.wa.gov>; larry.fisher@dfw.wa.gov; Kendall, David R NWS; David Radabaugh; Jeannie Summerhays; Clay Keown
Subject: Re: ERTS Information 632786

Hi all,

Could somebody please help solve this problem- where did the dioxins and PCB's at Harbour Village Marina come from and is the barge's churning up of lake sediment allowed or did it need an HPA from WDFW?

First of all, I observed pre- and post- barge activity on March 21 2012. I have an eye witness to the pre-barge moving event (Patrick Obrien on phone with Greg Stegman) when the people in the small boat were working in the water off the NW point of Kenmore Industrial Site (aka Lakepointe).

I contacted Greg by telephone this morning.

I have an appointment with Gary Sergeant Friday at 2pm.

I would like to call Mr. White. What is his number?

Who is the owner of the barge operation? Who is responsible if there is alleged translocation of lake sediment or contaminants of concern? Who is responsible for cost (of clean up if necessary) IF there has been translocation of contaminants of concern? How does anyone know if there is translocation of lake or stream sediments unless there is a prerequisite for measuring and monitoring? Who is regulating the water quality of these public locations?

Who should meet to talk to work out questions and answers? WSDOT; Pioneer Towing; Kiewit General Manson; ACE; NOAA, WDFW, DNR, City, Citizens? DOH, Harbour Village Marina and HV Condos, Adopt a stream foundation...

Sent from my iPhone

On Mar 29, 2012, at 7:30 AM, Ann Hurst <annmhurst@msn.com> wrote:

The below should read, "one Ecology expert in email mentioned the Navigation Channel as a potential source of PCB and Dioxin contamination at Harbor Village Marina," because of PCB contamination in Navigation Channel in 1996, as I recall.

From: <mailto:annmhurst@msn.com> annmhurst@msn.com
To: <mailto:gste461@ecy.wa.gov> gste461@ecy.wa.gov
CC: elizabeth.mooney@comcast.net; happyhaze@msn.com; patrickeobrien@comcast.net; mobr461@ecy.wa.gov; <mailto:cwan461@ecy.wa.gov> cwan461@ecy.wa.gov

Subject: RE: ERTS Information 632786
Date: Thu, 29 Mar 2012 06:25:27 -0700

Greg,
I did include the summary of your report at BasinNews.org and will post your document including the letter I wrote on the Documents page soon with WSDOT's response. I did not call Ecology. I wonder who did in addition to Elizabeth. That should be determined. Also, do you have the study of 1996 or 1998 that showed PCB contamination in the Navigation Channel?; one Ecology expert in email mentioned the Navigation Channel as a potential source of PCB and Dioxin contamination at Lakepointe. Janet and I will be looking at Ecology documents this morning and would appreciate not having to dig too deeply for that. Three experts point to three likely sources. I am thinking they all could be correct, that there is more than once source regarding contamination at Harbor Village Marina.
Best, Ann Hurst

From: "Greg Stegman (ECY)" <GSTE461@ECY.WA.GOV>
To: "elizabeth mooney" <elizabeth.mooney@comcast.net>
Cc: "Maura O'Brien (ECY)" <MOBR461@ECY.WA.GOV>
Sent: Wednesday, March 28, 2012 4:06:28 PM
Subject: ERTS Information 632786

Elizabeth,
Attached is my report regarding my visit to the site on 3/21/12 concerning the barge issue and other issues we discussed. I also have photographs if you are interested.

Greg Stegman
Department of Ecology
Water Quality Program
Northwest Regional Office
425-649-7019

The information about incident number 632786 is attached in PDF format.

Note: You need to have an Adobe Acrobat Reader to read the information.

Classification: UNCLASSIFIED
Caveats: NONE

O'Brien, Maura (ECY)

From: elizabeth.mooney@comcast.net
Sent: Monday, October 29, 2012 8:34 PM
To: O'Brien, Maura (ECY)
Cc: Elizabeth Mooney
Subject: Sediment and Water Sampling Kenmore Comment
Attachments: Meador et al. PCBs Duwamish Ecotox 2010.pdf; Meador AqConser 02 PCBs.pdf; ERTS March 21, 2012 tires and water.jpg; barge ERTS 632786 March 21 2012.jpg

Oct 28, 2012

Maura O'Brien
Department of Ecology

Dear Maura,

I realize that we've been talking with the City, Dept of Ecology and the community for years about wishing for a baseline testing of water quality and sediment at the Kenmore Shoreline.

Given the recent high levels of dioxins found at Harbour Village Marina, the barge/tug activities allegedly stirring up sediment in the North Lake Washington area, the migration of federally protected chinook salmon and the outmigration of smolts that hug the shoreline, the attached evidence (Meador) that provides evidence about detrimental effects of contaminants on fish, the PCB's present in fish in Lake Washington (DOH, Hardy et al.), I'd like to ask that you consider, if you can not presently gain permission for lake bottom sediment testing in the area of Calportland and Pioneer Towing for something like the following:

water samples (test for contaminants in the collected water) in addition to turbidity sampling, with those samples to be collected to reflect when turbid water is being caused by tugs/barges, and a background sample or two of the water when it is free of sediment being caused by tugs/barges

I am interested in protecting not only the habitat for fish and other animals, but also the environment for public health. I think it would be helpful to test the sediment by Calportland and Pioneer Towing to rule out any contaminants of concern, but, if they won't allow that testing of the lake bottom, then perhaps it would be possible for DOE to test the water for any contaminants when the barges are stirring up sediment (like that in the ERTS 632786) vs when the barges/tugs are not stirring up sediment in the head of the channel.

I am attaching the photos I took the first time I saw the barges going out of the head of the channel in March 2012 when I observed the very brown water and had seen the contractors measuring the depth of the mouth of the channel at 8:30 am. I am also attaching the articles that address the negative impacts of toxins on fish.

Thank you.

Elizabeth Mooney

Ecotoxicology (2010) 19:141–152
DOI 10.1007/s10646-009-0399-x

Bioaccumulation of polychlorinated biphenyls in juvenile chinook salmon (*Oncorhynchus tshawytscha*) outmigrating through a contaminated urban estuary: dynamics and application

James P. Meador · Gina M. Ylitalo · Frank C. Sommers · Daryle T. Boyd

Accepted: 29 July 2009 / Published online: 14 August 2009

Abstract A field study was conducted to examine bioaccumulation of polychlorinated biphenyls (PCBs) for hatchery-raised and naturally reared (wild) ocean-type juvenile chinook salmon outmigrating through the Lower Duwamish Waterway (LDW), a contaminated urban estuary in Seattle, WA, USA. These results show differences in bioaccumulation of PCBs over time and space in this estuary, which may also occur for any contaminant that is distributed heterogeneously in this system. Highly mobile, outmigrating salmon accumulated ~3–5 times more PCBs on the east side of the LDW than fish on the west side, which is supported by an almost identical difference in mean sediment concentrations. The tPCB concentration data suggest that for most of the spring and early summer, juvenile chinook were likely segregated between the east and west side of the LDW, but may have crossed the channel later in the year as larger fish. Additionally, we used biota-sediment accumulation factors to assess the relative degree of bioaccumulation and explore these factors as potential metrics for predicting adverse sediment concentrations. These results highlight the importance of time and space in sampling design for a highly mobile species in a heterogeneous estuary.

J. P. Meador (✉) · F. C. Sommers
Ecotoxicology and Environmental Fish Health Program, Environmental Conservation Division, Northwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 2725 Montlake Boulevard East, Seattle, WA 98112, USA
e-mail: James.meador@noaa.gov

G. M. Ylitalo · D. T. Boyd
Environmental Assessment Program, Environmental Conservation Division, Northwest Fisheries Science Center, National Marine Fisheries Service, NOAA, 2725 Montlake Boulevard East, Seattle, WA 98112, USA

Keywords PCBs · Bioaccumulation · Salmon · Spatial segregation · Toxicity guideline value

Introduction

Even though polychlorinated biphenyls (PCBs) were banned in the United States in 1979, they persist at high concentrations in sediments and aquatic foodwebs. The influx of cleaner sediments over time was expected to accumulate and bury these contaminants below the biologically active zone; however, these compounds still occur at very high concentrations in surface sediment and are biologically available to biota.

The Green River flows northwest from the western flanks of the Cascade Mountains near Mt. Rainier and travels ~150 km to Elliott Bay near downtown Seattle, WA, USA. For the last 19 km the Green River is called the Duwamish River and for the final 9 km it is known as the Lower Duwamish Waterway (LDW; Fig. 1). At river kilometer (rkm) 0 the river splits into the East and West Waterways around Harbor Island for 2 km before entering Elliott Bay. The LDW is a marine-influenced urban estuary that has been the focus of intense studies due to its highly contaminated sediment and water. The average width of the LDW is ~130 m and the water depth ranges from 3 to 20 m; however, most of LDW is maintained at 10 m depth (mean lower low water) by dredging. Even though most of the natural habitat has been severely altered, off-channel areas (e.g., Slip 4 and Kellogg Island) and a narrow shallow-slope intertidal habitat can be found along the waterway where outmigrating salmon likely forage and can be collected.

Past work has documented that sediment and organisms in the LDW are contaminated with PCBs, PAHs,

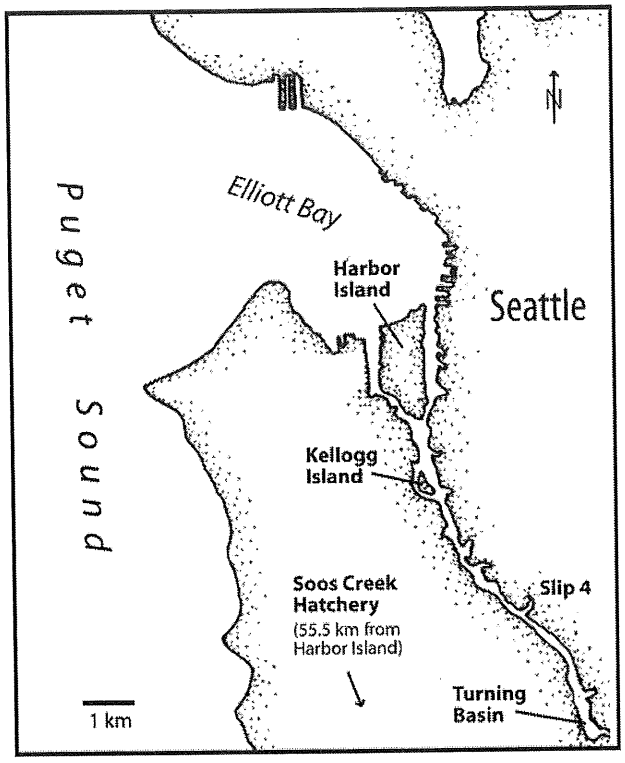


Fig. 1 Map of the Lower Duwamish Waterway

tributyltin, and other contaminants of concern (Varanasi et al. 1993; LDWG 2007). The entire LDW was listed as a Superfund site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 2001 and is currently progressing through the standard superfund remedial process. PCBs have been an important concern in the LDW for several years after they were discovered at high concentrations in sediment at several sites. We focused on PCBs because of elevated concentrations in the LDW, high potential for toxicity to juvenile salmon, low elimination rates in fish, and relative ease of assessing sediment and tissue concentrations.

Several salmonids including chinook (*O. tshawytscha*), coho (*O. kisutch*), chum (*O. keta*), and winter steelhead (*O. mykiss*), are raised in several hatcheries in this watershed and released every year. For most years, ~5–6 million fish have been released annually into the Green River and most of these (≈70%) are age 0+ (subyearling; age 0–1 year) ocean-type chinook (Sieler et al. 2002), which are protected in this watershed under the Endangered Species Act and were the target of our study. Juvenile chinook are released from three hatcheries on this system; however, 80% or more come from the Soos Creek hatchery. Additionally, ~1 million ocean-type chinook naturally rear (wild) in this system and also migrate through the LDW (Sieler et al. 2002). Since 2000, essentially all hatchery chinook released in this watershed have been marked by clipping their adipose fin. Because the error rate (bad clips) is generally low at ~4% (Ruggerone et al. 2006), this procedure has allowed us to distinguish hatchery from naturally reared fish with fairly high confidence. Juvenile salmonids migrate from relatively uncontaminated upstream waters into the Duwamish River and LDW during smoltification where they adjust to seawater, feed on relatively abundant invertebrates, and rear from a few days to several weeks before exiting to open water. The peak migration for age 0+ hatchery fish occurs from late May to mid June and wild fish are found in the Duwamish from mid January through late summer (Ruggerone et al. 2006).

The goal for this study was to examine PCB bioaccumulation in highly mobile, outmigrating juvenile salmon in this estuary, determine total amount accumulated, and examine the application of bioaccumulation factors to predict sediment concentrations that may result in adverse tissue concentrations. Our hypothesis was that juvenile chinook fish would migrate along the west or east bank of the river and reflect the contamination of each region. If fish freely crossed the waterway, the concentrations of PCBs and other contaminants in fish collected at Kellogg Island should be similar to the levels in fish collected at Slip 4. Small outmigrating salmonids tend to stay in shallow areas as they feed and migrate through an estuary (Healey 1991). On average, the west side of the LDW contains substantially lower concentrations of PCBs in sediment than those collected on the east side, which we hypothesized would be reflected in the amount bioaccumulated by the fish collected. Although not in our original design, we were also able to consider some temporal aspects of PCB bioaccumulation for juvenile salmonids because our sample dates spanned 11 weeks over late spring and mid summer.

Methods

The area of focus for this study is the lower Duwamish River occurring from the turning basin (rkm 7.6) to the confluence of the east and west waterways at the southern tip of Harbor Island (rkm 0; Fig. 1) and constitutes most of the marine influenced section of the Duwamish River. The surface area of intertidal and subtidal sediment in this section of river is ~142 ha (350 acres).

Fish sampling

Juvenile chinook were sampled from four locations in this river system. For the upstream sites in the Green River, fish were collected from the Soos Creek Hatchery on Big Soos Creek (a few km upstream of the confluence of the Green River and Big Soos Creek at rkm 54.4) for 3 years

(2000–2002) usually before they were released in late May, except in 2002 when fish were sampled from the hatchery on 8 August. Naturally reared fish (wild) were also collected one year (2000) from a screw trap at rkm 55.6, which is upstream from the Soos Creek hatchery and confluence of the Green River and Big Soos Creek. These fish were acquired live from personnel of the Washington Department of Fisheries and Wildlife (WDFW).

On the west side of the LDW, we collected fish at Kellogg Island, which is a semi-natural area off the main channel at rkm 1.3. On the east side we sampled fish at Slip 4 (rkm 4.3), which is a 1.5 ha (3.6 acre) blind inlet off the main channel. Historically, we have observed large numbers of migrating salmon and other fish species at these two locations. We sampled at both LDW sites over 4 years (2000–2002 and 2004). For the year 2000, we sampled fish in late May; ~5 days after the last group of hatchery fish had been released from the Soos Creek hatchery. For subsequent years, we collected fish at these sites from late June to early August. We also analyzed two composite samples of juvenile coho collected at Slip 4 in 2002 to determine if the values for whole body and stomach concentrations were similar to those found for chinook.

A 100-m beach seine was used in the LDW for sample collections and all fish were kept alive in coolers until processing at our laboratory. Samples were frozen at −80°C until analyzed. Stomach contents were removed from all fish; therefore the whole-body concentrations represent only the PCBs that were assimilated. Whole fish were analyzed as individuals or composite samples, each containing from 3 to 10 individuals. Samples for stomach contents were almost always composites of material from several individuals.

Analytical determinations for OCs and lipid in tissue

Whole-body fish and stomach content samples were analyzed for organochlorines (OCs), including dioxin-like PCBs, other selected PCB congeners, by a high-performance liquid chromatography/ultraviolet photodiode array (HPLC/PDA) method (Krahn et al. 1994). Sample extractions were split for PCB and lipid analyses. Prior to sample cleanup, a 1 ml portion of each whole-body extract was removed for percent lipid analyses by thin-layer chromatography/flame ionization detection (TLC/FID) (Ylitalo et al. 2005b). Lipid classes were measured by FID, but are not reported here. Percent lipid values were calculated by summing the concentrations of all lipid classes determined for each sample.

A separate study compared the tissue concentrations from sample splits for our HPLC/PDA method (NOAA lab) and those obtained with high resolution gas chromatography/mass spectrometry (GC/MS; Axys Analytical Services LTD, Sidney, British Columbia, Canada). The results for 30 samples (four species, whole body and muscle, range of 5–300 ng/g) indicated close agreement between methods, although 80% of the GC/MS values were higher than those for the HPLC/PDA method (Sandie O'Neill and James West, WDFW, personal communication). The overall mean (SD) percentage difference among all samples was 24 (0.22)%, which is very low. These results are supported by other studies that have shown close agreement for summed PCB concentrations obtained by the HPLC/PDA and GC/MS methods for a wide range of marine biota (Krahn et al. 1994; Ylitalo et al. 2005a).

Quality assurance for HPLC/PDA method

A method blank and a National Institute of Standards and Technology (NIST) blue mussel Standard Reference Material (SRM 1974a or 1974b) sample were analyzed with each sample set containing 8–12 field samples as part of a performance-based quality assurance program (Sloan et al. 2006). Results obtained for SRMs were in excellent agreement with the certified and reference values published for these materials by the National Institute of Standards and Technology. In addition, the other quality control samples met established laboratory criteria. Duplicate analyses were conducted for 10% of the tissue samples, with relative standard deviations ≤30% for more than 80% of analytes detected in the samples. Method blanks contained no more than four analytes that exceeded four times the limit of quantitation (LOQ), unless the analyte was not detected in the associated tissue samples in the set. The percent recovery of the surrogate standard ranged from 70 to 105%.

Sediment concentrations

A separate study of 326 sediment samples for PCBs in the Duwamish estuary (Industrial Economics 1998) was used to analyze bioaccumulation in fish (Table 1). This study conducted a comprehensive analysis of PCBs in sediment over the entire Lower Duwamish Waterway (142 ha sampled) from the turning basin to rkm 0 that included our fish collection sites. Total organic carbon and PCBs were determined for each sample, which allowed determination of the organic-carbon normalized sediment concentrations (sed_{oc}). The same method (HPLC/PDA) for PCB analysis described above for tissue was also used to quantify PCBs for these sediment samples. Of the sediment sites that were examined in detail, tPCBs from the LDW were mostly consistent with the Aroclor 1254 pattern or a mix of Aroclors 1254 and 1260 (>90% of samples).

The waterway was divided into five cross-river sections (intertidal and subtidal for the east and west sides and the navigational channel). The demarcation between the

Table 1 Concentrations of total polychlorinated biphenyls (tPCBs) in sediment

Regions and locations	Mean sediment (ng/g sed)	Mean sed_{oc} (μg/g OC)		Hectares	Sediment (ng/g sed)				
		Mean (SD)	Median		10th	25th	50th	90th	95th
West side	150 (20) 113	10.6 (1.5)	5.1	54.2	7	28	63	337	545
East side (to Slip 4)	500 (150) 95	33.5 (9.8)	7.8	22.9	6	11	107	1,038	1,987
Kellogg Island	190 (60) 35	8.9 (1.8)	5.3	28.9	11	28	69	444	756
Slip 4	1,200 (320) 42	88.8 (24.5)	35.1	16.5	74	190	450	2,700	4,511
East side—Slip 4 to opposite Kellogg Island	180 (40) 59	10.7 (1.6)	6.5	18.6	18	41	87	428	672

Values are mean and standard deviation (SD) for total PCBs in sediment and sed_{oc} (organic carbon (OC) normalized values; μg total PCBs/g OC in sediment). Several percentile values are also shown for each region and location. All values determined with minimum unbiased estimator for a lognormal distribution. Following SD denotes the number of samples per mean value. Data from Industrial Economics (1998)

subtidal areas and the channel was determined from navigation charts (Industrial Economics 1997). Within these major sections, numerous substrata were defined. A total of 90 substrata (nonoverlapping polygons of the sediment surface) were determined for the LDW. Some of the substrata represent discrete areas (e.g., slips, backwaters, noncontinuous intertidal areas, outfalls, and seeps). The overall intent for this sampling scheme was the primary efficiency criterion of stratification designs that concentrations within strata are more homogeneous than concentrations over the entire study area (Industrial Economics 1997).

Sediment sample sites within substrata were determined randomly and spaced less than 100 meters apart. Of the 54 substrata selected for our analysis, the mean (SD) size was 1.42 (1.45) ha. The mean (SD) number of samples for all substrata from that study was 2.2 (1.7) per hectare and no one area was overly represented. Substrata in the navigation channel were not included because we assumed that juvenile chinook would not occur in that area of the LDW or interact with this benthic environment that is frequently disturbed by river flow, tidal flux, and vessels.

To determine the mean sed_{oc} for the west side, all intertidal and subtidal samples from just north of the Turning Basin (rkm 7.6) to the southern tip of Harbor Island (rkm 0) were included. This value was used for the BSAF calculation for salmonids collected at Kellogg Island. Similarly, we choose all intertidal and subtidal sediment samples from just north of the Turning Basin to ~1,000 m north of Slip 4 on the east side for the BSAF equation for chinook collected at Slip 4. One sediment sample in Slip 4 was excluded because it was considered an outlier (Grubbs test, $P < 0.0001$). The tPCBs for this one sample was 25 μg/g, which was 50 times the mean value for all east side samples ($n = 96$) and was therefore not representative of values from this region. This hot spot represented a very small area and its inclusion would likely have skewed the BSAF values and conclusions. We also determined the sediment concentrations at the collection sites. For Kellogg Island, we included all inter- and subtidal sediment data from sampling sites around Kellogg Island and all sites ~1,000 m north and south of the island to calculate the mean sed_{oc}. The sediment concentrations for Slip 4 were determined in a similar fashion including all sites in Slip 4 and those inter- and subtidal sites 1,000 m to the north and south of this area.

Most of the PCB sediment contamination occurs on the east side of the LDW in inter- and subtidal areas from the Turning Basin to Slip 4 and is substantially more contaminated than the west side (Industrial Economics 1998). We determined that 56% of the sample sites on the east side contained PCB sediment concentrations >100 ng/g dry wt, which was higher than that for the west side (25%). Because we did not sample fish downstream of Slip 4 on the east side of the river those sediment concentrations were not included. The mean concentration for all sub- and intertidal sediment samples between Slip 4 and Harbor Island (rkm 0) on the east side was determined to be much lower than the upriver portion of the east side and very similar to the mean determined for the entire west side of the LDW (Table 1). This area contained one sample that was 23 times higher than the mean value and 10 times higher than any other concentration. It was determined to be an outlier based on Grubbs test ($P < 0.0001$) and was excluded for the same reasons stated above for the one Slip 4 value. If included, the mean tPCB sediment concentration would be 220 ng/g dry wt. a 25% increase, which was considered an undue influence for one of 60 samples.

Determination of PCB accumulation in the lower Duwamish

We used a mass balance approach to determine the total ng of PCBs accumulated per fish (body burden, bb) collected in the lower Duwamish.

$$PCB_{bb} = tPCB_{ld} \times WT_{ld} - tPCB_{u} \times WT_{u} \quad (1)$$

where PCB_{bb} represents the total ng of PCBs accumulated, $tPCB_x$ denotes the concentration of total PCBs (wet

weight), and WT_x is the wet weight for each fish or composite mean sampled. Subscripts for x are as follows: ld denotes fish collected in the Lower Duwamish and u denotes upriver fish (hatchery or wild). For all hatchery fish collected in the LDW we used the hatchery-collected fish for the upriver concentration in Eq. 1 ($tPCB_u$) and for all wild fish collected in the LDW we used the mean concentration of tPCBs measured in wild fish collected from the screw trap in 2000 ($tPCB_u$).

Biota-sediment bioaccumulation factors (BSAFs) were calculated to highlight differences and similarities among species and sites. The following equation was used:

$$\mathrm{BSAF} = \frac{[\text{tissue}]/f_{\text{lip}}}{[\text{sediment}]/f_{\text{oc}}} \quad (2)$$

where f_{oc} is the fraction of organic carbon (g/g dry wt.) and f_{lip} is the fraction of lipid (g/g wet wt). For the collection year 2000, specific site and type (wild or hatchery) lipid concentrations were used. For all other years a mean lipid value of 1.0% was determined from all remaining data and used for the BSAF calculations for chinook.

We assumed that fish had an equal chance of visiting (temporally and spatially) each of the sediment sites that were used for these calculations. We also assumed that each tPCB sediment concentration was proportional to the tPCB concentration for water and prey in the immediate area around the sample and that accumulation was proportional to the OC normalized sediment concentration (sed_{oc}). We calculated BSAFs using mean tissue and sediment concentrations, which we believe provided a better estimate of bioaccumulation than median values.

These BSAF values were used to determine a sediment concentration that would be expected to protect outmigrating juvenile salmon from adverse biological effects. This sediment quality guideline was calculated with Eq. 1 by solving for sed_{oc}. For these calculations we used a mean whole-body lipid content of 1% wet weight (Table 2) and the 50th percentile for organic carbon (OC), which was 1.6% dry wt for each side of the waterway. We selected the PCB tissue toxicity guideline of 2.4 μg/g lipid for salmonids from Meador et al. (2002) for conversion to sediment values.

Toxicity equivalents

We calculated the sum of toxic equivalents (ΣTEQs) for dioxin-like (dl) PCBs for each sample. Each TEQ was determined by multiplying a dl PCB concentration with its toxicity equivalent factor (TEF) for fish, which was obtained from van den Berg et al. (1998). Our analytical method quantified the dl-PCB congeners 77, 105, 118, 126, 156, 157, 169, and 189. The other four dl congeners (81, 114, 123, and 167) were not quantified due to problems with coelution by interfering compounds. The TEQ levels calculated in the current study are conservative values because of the higher limits of detection of the HPLC/PDA system compared to the GC/MS method and they do not include the contributions from polychlorinated dibenzodioxins (PCDDs) or dibenzofurans (PCDFs). In addition, when the concentration of a dioxin-like PCB was below the LOQ, a value of zero for the specific congener was used in the calculation, which was more conservative than the commonly used value of one-half the LOQ. These below-detection values were not used because our LOQ was relatively high (0.03–0.4 ng/g wet weight for most samples), which was due to low sample weights (<4 g).

Statistical analysis

Most of the concentration data reported here were log-normally distributed, which is very common for such data (Gilbert 1987). Because lognormally distributed data are skewed, a minimum variance unbiased (MVU) estimator is more appropriate for computing statistics, such as the mean, variance, and quantiles. We used the MVU estimator algorithms in Gilbert (1987) for estimating the mean, variance, and quantiles (Eqs. 13.1, 13.2, and 13.24) for all log-normally distributed data (TEQs, BSAFs, and whole-body, stomach, and sediment concentrations). This MVU algorithm was not used when sample sizes were <3. We used SYSTAT 11 to construct cumulative distribution functions (CDFs), perform regression analysis, and to examine distributions. Statview 5.0 was used to perform Analysis of Variance (ANOVA) and post-hoc testing. After performing the ANOVA, a post-hoc examination of treatment means was conducted with Fisher's Protected Least Significant Difference (PLSD) test. Log values for concentrations were used for ANOVAs and regressions. We also used Grubbs Test to examine datasets for statistical outliers. Standard deviation is shown to provide a measure of the range in data and standard error of the mean (SEM) was used to indicate variation about the mean.

Results

PCBs in salmon

Juvenile chinook from upstream areas (hatchery and screw trap) contained very low levels of tPCBs, except for hatchery fish in 2001 (Table 3). Mean tPCBs concentrations in fish collected from Slip 4 were always higher than those collected at Kellogg Island. Although variability was observed among individuals, it was likely due to a range in time spent in the LDW (Fig. 2). The differences between wild and hatchery fish collected in the LDW were mixed.

Table 2 Data for salmon collected in the Duwamish River and upstream

Year		Type	Wt (g)	Len (mm)	Lipid (%)	BSAF	BSAF median	N {N tot}
Kellogg Island								
2000	May	Chinook W	4.4 (1.1)	76.5 (6.8)	1.6 (0.3) 4c	0.18 (0.01)	0.18	17 {31}
	May	Chinook H	4.8 (0.2)	79.7 (0.3)	1.8 (0.1) 3c	0.21 (0.02)	0.21	3 {30}
2001	June	Chinook W	5.4 (3.0)	84.5 (18.9)	–	0.82 (0.53)	0.47	4 {4}
2001	August	Chinook W	12.1 (4.3)	106 (8.9)	–	0.35 (0.07)	0.20	35 {39}
2001	June	Chinook H	6.1	85	–	0.21	–	1 {1}
2001	August	Chinook H	12.3 (2.1)	111 (4.2)	–	0.89 (0.44)	0.48	6 {6}
2002	August	Chinook W	10.7 (5.2)	100 (12.3)	1.1 (0.3) 7i	2.9 (1.3)	1.4	7 {7}
	August	Chinook H	19.7	124	1.2 1i	3.9	–	1 {1}
2004	July	Chinook H	9.8 (1.0)	102 (2)	0.9 (0.7) 3c	1.2 (0)	1.2	3 {9}
	July	Chinook W	11.3	107	1.9	0.8	–	1 {3}
Slip 4								
2000	May	Chinook H	4.6 (1.0)	80.1 (5.6)	2.0 (0.1) 2c	0.30 (0.12)	0.20	7 {15}
	May	Chinook W	3.4 (0.1)	69.5 (0.7)	–	0.25 (0.3)	–	2 {2}
2001	June	Chinook W	3.5 (0.9)	72.3 (5.6)	–	1.1 (0.18)	1.0	12 {12}
2001	August	Chinook W	12.7 (4.3)	107 (11.0)	–	0.90 (0.6)	0.36	5 {5}
2001	June	Chinook H	5.0 (0.08)	82.7 (1.5)	–	0.55 (0.16)	0.50	3 {3}
2001	August	Chinook H	12.7 (3.3)	109 (7.3)	–	0.53 (0.1)	0.46	4 {4}
2002	August	Chinook W	7.3	8.8	0.9 (0.3) 2i	1.2	–	1
	August	Chinook H	20.5	120	1.1 1i	3.8	–	1
	August	Coho W	5.4 (0.7)	78.8 (4.5)	1.8 (0.1) 2c	0.8 (0.1)	–	2 {7}
Soos Creek								
2000	–	Wild	3.9 (0.8)	73.3 (5.5)	1.9 (0.4) 2c	–	–	14 {26}
	–	Hatchery	6.0	–	2.2 (0.6) 3i	–	–	–
2001	–	Hatchery	2.5 (0.07)	–	–	–	–	7 {7}
2002	–	Hatchery	9.4 (0)	–	1.6 (1.2) 2i	–	–	2 {2}

Values shown as mean and standard deviation and determined with algorithms for lognormal distributions (Gilbert 1987) for all $n \geq 3$. Type (*W* wild; *H* hatchery; *M* mix of both types). *N* is the number of samples for each mean and *n* total is the total number of fish measured for length, weight, PCBs and BSAFs. Sample sizes for lipids shown next to value. "i" indicates individuals and "c" indicates composite values (ci indicates a combination of composite and individual values). Composite samples contained 3–10 individuals

There were no significant differences between hatchery and wild fish collected at Slip 4 for all years combined. Concentrations of tPCBs in the hatchery origin fish collected from Kellogg Island were significantly higher than wild fish ($P = 0.04$) when all years were considered, which was mostly due to a pulse of upriver wild fish with low tPCBs in August 2001.

The tPCB values for the composite samples containing coho salmon were not different than those containing chinook from Slip 4 in 2002. The coho whole-body concentrations were 550 and 440 ng/g, which were lower than the mean value for the two individual chinook (725 ng/g). The stomach contents concentrations for the coho and chinook composite samples (one each) for 2002 from Slip 4 were essentially identical (750 and 770 ng/g), which is reflected in the mean value and low SD.

The temporal aspect of PCB bioaccumulation is also noteworthy. The fish collected in 2000 were sampled in late May, which was ~5 days after the last release of fish from the Soos Creek hatchery. Total PCB concentrations in both wild and hatchery fish for the year 2000 were relatively low compared to the other sampling periods, which occurred later in the summer (Fig. 2). The Kellogg Island fish contained substantially lower concentrations of tPCB than Slip 4 fish for the years 2000 ($P < 0.005$) and 2001 ($P < 0.0001$; Table 3; Fig. 2). For 2002, the differences were far less substantial ($P = 0.12$), which may have been due to larger fish that were able to cross the waterway. The highest tPCB concentrations for Kellogg Island fish occurred in the largest fish collected, which may be the result of an increased ability to cross the waterway from the east side. Excluding all fish with tPCB concentrations <15 ng/g (these were considered background levels), the correlation between fish weight and tPCBs for Kellogg Island fish (all years) was highly significant ($P < 0.001$) with an $r^2 = 0.50$ ($n = 59$). There was no such correlation

Table 3 Total PCB concentrations in juvenile salmon collected in the Duwamish River and upstream

	Soos Creek hatchery	Soos Creek wild	Kellogg Island hatch	Kellogg Island wild	Slip 4 hatch	Slip 4 wild
Whole body						
24–31 May 2000	15 (1.1) 5i	7.8 (0.8) 14ci	40 (4) 3c	30 (1.3) 17 ci	203 (80) 7ci	131 (159) 2i
25 June 2001	50 (2.4) 7i	–	24 1i	94 (56) 4i	185 (59) 3i	376 (60) 12i
1 August 2001	–	–	94 (47) 6i	37 (7) 35 ci	177 (34) 4i	302 (195) 5i
7–8 August 2002	10 (0.1) 2i	–	445 1i	302 (151) 7i	725 (375) 2i M	495 (78) 2c ¥
29 July 2004	–	–	130 (0) 3c	180 1c	–	–
Stomach contents	Soos hatchery	Soos Creek wild	Kellogg Island mix		Slip 4 mix	Difference
2000	–	23 1c	57 (21) 3c		247 (30) 3c	4.3
2001	–	–	182 (138) 2c		445 (360) 2c	2.4
2002	12 Ø	–	260 (-) 1c		760 (14) 2c ¥	2.9

Values are mean and standard deviation (SD) ng/g. Following SD denotes n observations per mean value; "i" means individuals and "c" means composite values (ci indicates a combination of composite and individual values). Whole-body composite samples contained 3–10 individuals. M is mix for origin and mostly hatchery fish. Stomach contents were removed from these fish and used for separate analysis as composite samples containing 5–30 individuals. Date shows when in-river fish collected. Soos Creek fish (wild and hatchery) collected 18 May to 1 June, except for 2002 (8 August). Chinook in all samples except for ¥, which was two composite samples ($n = 3$ and 4 individuals) of juvenile coho and one comp for stomach contents (770 ng/g). Ø hatchery food. All values as wet weight, except fish food as dry wt (wet wt. equivalent for fish food $\approx$ 2.7 ng/g)

when all fish from Slip 4 were considered ($P = 0.42$, $r^2 = 0.02$, $n = 36$). Additionally, any whole-body tPCB value over 400 ng/g in fish from Kellogg Island was determined to be a statistical outlier ($P < 0.05$) in Grubbs test, which supports the contention that larger fish (>15 g) collected at Kellogg Island did not accumulate most of their PCBs from the west side of the LDW.

Concentrations of tPCBs in stomach contents of juvenile chinook collected at Kellogg Island and Slip 4 were substantially elevated compared to stomach contents in upriver wild fish and hatchery food (Table 3). These values also show site and year differences that are consistent with those for whole-body tPCBs. An analysis of the ratio for tPCBs in whole-body juvenile chinook and stomach contents (wet weights) for site/year combinations were relatively consistent with a mean (SD) of 0.77 (0.40) $n = 12$.

For the 2001 hatchery fish, we had sufficient data to estimate a likely growth rate. Five fish were sampled from the hatchery (mean (SD) 2.5 (0.1) g) on 7 June 2001 and compared to hatchery fish collected 54 days later at Kellogg Island and Slip 4 in the LDW. The mean weight (SD) for those fish was 13.7 (4.6) g $n = 10$. Based on a simple growth equation the mean growth rate was determined to be 3.2% bw/day (range = 2.6–4.4% bw/day). Fish were released from the hatchery between 18 May and 11 June 2001, therefore these values represent the maximum growth rate. If we assumed that all of the fish collected were from the earliest date (18 May) the mean growth rate would be 2.4%; however, these fish would have been smaller at the time of release.

For each individual fish and composite sample we determined the amount of tPCB that was accumulated in the LDW, which is presented as a percentage increase in total body burden (Fig. 3). This plot shows the general trend of higher bioaccumulation for Slip 4 fish and compared to Kellogg Island fish. All fish exhibited a positive increase in the total amount of PCBs and most increases were substantial. For example, the median increase in total ng of PCBs for all juvenile chinook collected in this study was 11-fold, which is equivalent to a 1,000% increase.

The ΣTEQ values (PCBs only) for all salmonid samples were low exhibiting a mean (SD) of 0.012 (0.024) ng/g lipid. The relationship between tPCBs and ΣTEQs in juvenile salmonids was very strong ($r^2 = 0.90$, $n = 110$) indicating that the concentration of tPCBs is a good predictor for the toxic potential from the dioxin-like congeners (Fig. 4).

Lipids

Percent lipid content for whole-body juvenile chinook based on wet weight was similar for the years 2001–2004 but higher for the year 2000 (Table 2), which is consistent with the usual pattern of smoltification whereby fish lose lipid content as they transition to seawater (Brett 1995). The mean and SEM was 1.0% (0.1) for 16 individual and composite chinook samples collected over 2001–2004.

BSAFs

The P-values ($n = 6$) for all possible pair combinations for the year 2000 BSAFs from the PLSD multiple comparison test were high ($P > 0.57$) indicating no difference between regions or fish origin for this year (Table 2). The majority

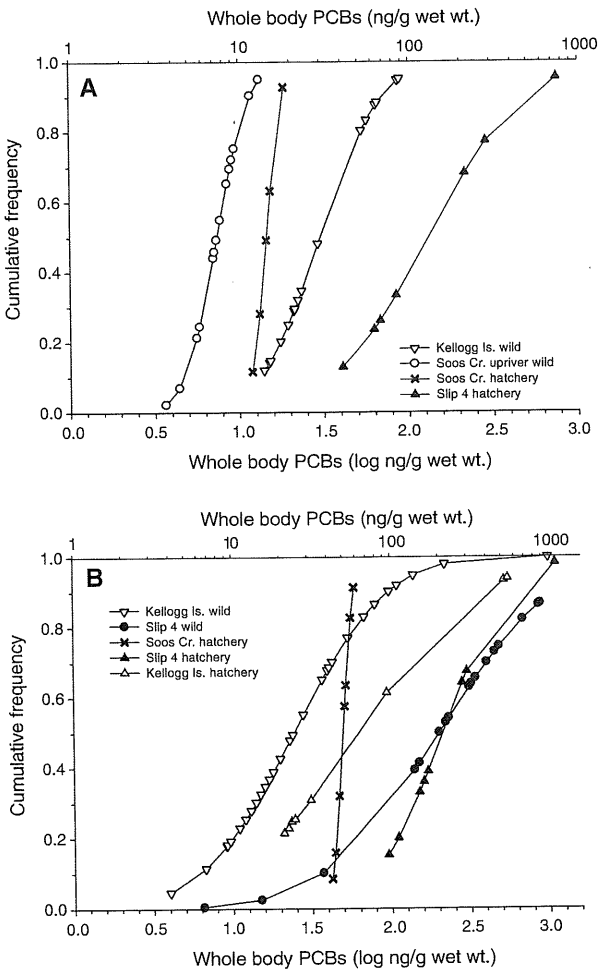


Fig. 2 Cumulative frequency distribution for total PCBs in juvenile chinook. Log_{10} concentrations are plotted. Upper x-axis show arithmetic equivalents. Location and origin (hatchery or wild) shown. **a** Data for the year 2000. **b** Data for the year 2001

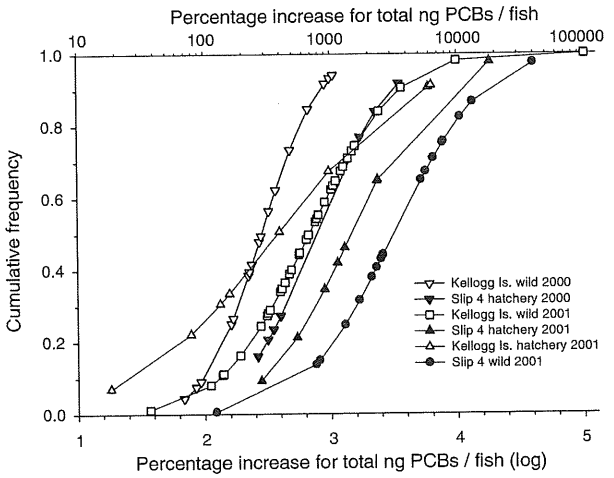


Fig. 3 Increase in total polychlorinated biphenyls (PCBs) in juvenile chinook. Cumulative frequency plot shows the percent increase in total nanograms of PCB per fish for the years 2000 and 2001. Data are based on individual fish or mean values for composite samples and plotted as log_{10} values. Arithmetic values shown on top x-axis. Location, fish origin (wild or hatchery), and year of collection indicated in legend

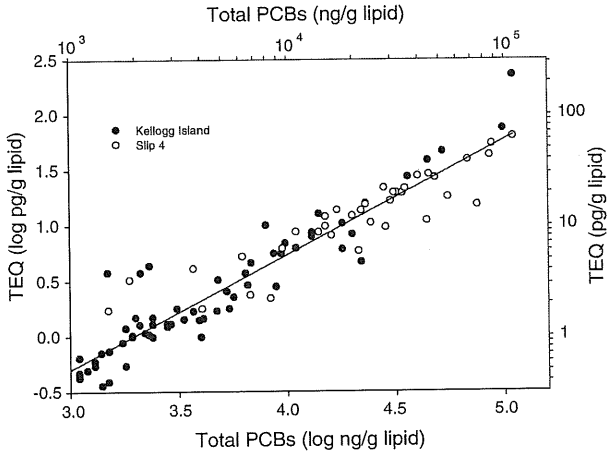


Fig. 4 Regression of total PCBs and PCB TEQs. Values are log_{10} total PCB concentrations in whole body juvenile chinook salmon and the sum of toxic equivalent quotients (TEQs) for the dioxin like PCBs. Arithmetic equivalents shown on the upper x-axis and right y-axis. The equation is $\Sigma TEQ = 3.39 + 1.03*tPCBs$, all concentrations as log_{10} ng/g or pg/g lipid

(74%) of all pairwise comparisons between year 2000 BSAFs and all other years were significantly different ($n = 26$). Fish collected for the years 2001–2004 were collected later in the summer, which provided potentially more time for bioaccumulation and higher BSAFs. Almost all comparisons among 2001–2004 BSAFs returned high P-values ($P > 0.1$), except for one low value for Kellogg Island wild fish for 2001.

Sediment guideline

We calculated the 50th, 90th, and 95th percentile sediment concentration associated with its respective BSAF for a given region for the years 2001–2004 (Table 4). These were calculated for all outmigrating juvenile salmon, except those from the year 2000 because of the short time spent in the lower Duwamish. If the year 2000 samples were included, the percentile values for the BSAFs would change slightly (e.g., 90th percentile, Kellogg Island = 1.4 and Slip 4 = 2.2) from the values presented in Table 4.

Discussion

PCBs in tissue

The variability in tPCB concentration in outmigrating juvenile chinook was high over time and space; however, a

Table 4 Proposed sediment values to protect against adverse effects in the Lower Duwamish Waterway

Qtile	Fish (tPCBs)		BSAF	Sediment guideline (tPCBs)	
	ng/g	µg/g lipid		µg/g OC	Sed ng/g
Kellogg Island/west side ($n = 58$)					
50th	39	3.9	0.36	7.1	106
90th	205	20.6	1.9	1.3	20
95th	331	33.1	3.0	0.83	13
Mean (sd)	88 (19)	–	0.81 (0.18)	–	–
Slip 4/east side ($n = 26$)					
50th	237	20.8	0.72	3.4	55
90th	789	90.7	2.4	1.0	16
95th	1111	138	3.4	0.70	12
Mean (sd)	360 (75)	–	1.1 (0.2)	–	–

Mean, SD, and various quantile values (Qtiles) determined with equation for lognormal distribution in Gilbert (1987). All fish for a given region over years (except 2000) were combined (years 2001–2004). Equation 2 used to determine sed_{oc} guideline values using BSAF and tissue guideline (2.4 µg/g lipid) for salmonids from Meador et al. (2002). Mean whole-body juvenile chinook lipid was 1% wet weight and 50th percentile for organic carbon (OC) for each side was 1.6% dry wt

few distinct patterns were detected. These data show that fish on the more contaminated east side of the LDW accumulated far higher amounts of tPCBs than those collected on the west side. Even though some benthic areas on the west side of the LDW contain high concentrations of tPCBs, it appears that the overall average concentration for the different sides is the more important metric for determining bioaccumulation in this mobile species. Based on these observations we conclude that the outmigrating fish probably follow the shallow areas of one side of the waterway or the other and are not likely to cross the channel until later in the summer when they achieve a larger size. One study (Ruggerone et al. 2006) sampled the mid channel area of the LDW from December through February 2005 with a purse seine and found no young-of-the-year chinook ($\sim$1.5 g individuals) in this habitat.

The concentrations of tPCBs in fish collected in the year 2000 were on average lower (two to tenfold) than for fish sampled in other years. This lower tPCB trend was not apparent for the year 2000 Slip 4 hatchery fish, which was due to due one individual fish out of 15 that comprise the mean. Without that one value, the mean drops 38% (from 203 to 125 ng/g). These lower values for the year 2000 fish may have been due to the relatively short time for exposure due to recent releases from the main hatchery, increased competition for prey items, or a change in the composition of their prey. The low tPCB concentrations in hatchery fish for the year 2000 may have been caused by the limited time these fish were in the LDW; however, this does not explain the lower values for wild fish, which may have been in the system longer. A plausible explanation for these differences is the expected high degree of competition for prey items among all fish during peak migration of the hatchery fish, which is supported by the lower concentrations for stomach contents for the year 2000 fish. The large release of hatchery fish and subsequent potential competitive interactions among these fish in the Duwamish for scarce resources has been proposed by Nelson et al. (2004) and Ruggerone and Jeanes (2004). This peak in abundance is relatively short-lived because most of the hatchery fish spend little time in this estuary (Nelson et al. 2004).

The low values for 2001 (August) Kellogg Island wild fish were considered atypical due to a number of large fish with near background concentrations. Based on this observation it appears that some juvenile salmon may reside upriver for extended periods before migrating into the contaminated lower estuary. This was observed by Nelson et al. (2004) for both wild and hatchery fish collected at rkm 21 in late June. Interestingly, the percentage of wild fish with low tPCBs (<25 ng/g) for both sampling dates (June and August) at Kellogg Island was far higher (58%) than what we observed at Slip 4 (13%), indicating that these newly arrived fish likely migrated down the west side of the waterway or spent very little time in the LDW before collection at Kellogg Island.

Wild fish are present in the Duwamish as early as January (Ruggerone et al. 2006; Nelson et al. 2004) and show two peaks in abundance, late February/early March for the fry migrants and late May for the fingerlings (Nelson et al. 2004). Based on these data, it is possible that wild chinook may spend several weeks in contaminated areas of the Duwamish accumulating PCBs. As discussed by Thorpe (1994), residence time in an estuary for juvenile chinook is variable and generally a function of season, fish size, and type of estuary; however, 30–90 days is not unusual.

All juvenile chinook increased their total PCB load as they outmigrated through the Lower Duwamish Waterway. As tPCB concentrations increased, fish also increased in

mass, which resulted in very high percentage increases in total PCB burden. Juvenile chinook in an estuary are capable of growing at rates of 3–5% body weight/day (Brett 1995; Healey 1991), which is consistent with our observed growth rates of ~3.2% bw/day for the 2001 fish and one study conducted in the LDW (Cordell et al. 2006). This very high rate of growth is due to a feeding rate of 12–20% body weight per day (Brett 1995), which is an important factor because these fish are likely accumulating contaminants at a high rate as a consequence of their high ingestion rate. The rate of prey consumption is an important kinetic parameter for any food web or bioaccumulation model.

One interesting observation is the percentage occurrence of wild versus hatchery fish in our collections. For the year 2000 the percentage of wild fish was 38%, which was most likely related to the recent releases of hatchery fish into the system. For the succeeding years, the percent occurrence of wild fish was far higher averaging 62%, including 1 year (2001) that averaged 83% wild fish. Studies have shown that hatchery reared fish will spend less time in the estuary than naturally reared fish (Levings et al. 1986), which is apparent from these data. This observation is important because we are more concerned with impacts to wild fish, including chinook salmon, under the Endangered Species Act than fish of hatchery origin. Due to the higher percentage of wild fish during the summer months and the higher levels of bioaccumulation observed for these fish compared to those earlier in the spring, the main focus should be on this group of fish that have spent several weeks in the estuary accumulating high levels of toxic compounds.

It is difficult to predict habitat usage by highly mobile, outmigrating juvenile chinook; however, we expected that a large percentage of fish would stay close to shore because of the generally higher abundance of prey and protection from predators. We believe that the higher tissue concentrations and relatively similar BSAFs for fish from the east versus west side of the waterway support this assumption of segregation within this system and indicate the need to consider appropriate geographic scales for bioaccumulation assessment for this (or any) fish species.

We found a very high correlation ($r^2 = 0.90$) between total PCBs and PCB TEQ values that could be used for predictions of toxicity. A few fish were elevated (PCB TEQ > 0.05 ng/g lipid); however, most were below the mean 95th percentile species protection benchmark for lethal effects (0.39 ng/g lipid) proposed by Steevens et al. (2005). When other dioxin-like compounds are considered, chinook at this life stage, and other species in the LDW, may exhibit TEQ values that are high enough to elicit toxic responses. It is known that dioxin-like compounds can impair the immune system, inhibit growth, cause thymic atrophy, and act as endocrine disruptors (Giesy and Kannan 1998), each an important function for estuarine fish.

BSAFs

As expected, the BSAFs for the year 2000 were generally lower because fish were collected in the spring, which is likely due to a short time period for accumulation, type of prey items available, or competition leading to reduced dietary uptake. For the other years, some of the juvenile chinook samples exhibited BSAF values that were surprisingly high. Based on their growth rate, juvenile chinook likely have a high rate of dietary accumulation and therefore would accumulate high tissue concentrations relatively rapidly. It is possible for these fish to exhibit high levels of accumulation and relatively high BSAFs after several days to a few weeks in the LDW. Additionally, salmonids have a high rate of ventilation, therefore uptake from the water column via the gills could be an important pathway for contaminant accumulation (Meador et al. 2008). The relative similarity for chinook BSAFs between the two regions for a given year (Tables 2, 4) and the high *P*-values between matched Kellogg Island and Slip 4 samples indicates that our selection of sediment concentrations for the BSAF calculations was appropriate for this species. This is also supported by the data in Table 4. If we had selected the sediment concentration at the collection sites, the tPCB tissue concentrations should have be tenfold higher in fish from the east side of the LDW compared to those from the west side. Additionally, using those Sed_{oc} values (8.9 and 88 μg/g OC) would have produced highly skewed BSAF values. Given the expected similar rates of ingestion and ventilation for these fish, plus a similar time frame for exposure, the BSAF values between the two sides of the LDW were expected to be similar.

Our intent was not to use BSAFs as an indicator of steady-state bioaccumulation or the theoretical bioaccumulation potential, but to allow for interconversion between tissue and sediment concentrations with the lowest achievable variance. The mean and various quantiles for the chinook BSAFs for both regions were relatively similar and varied by less than a factor of two, which was considerably less than the variability observed for whole-body tPCBs. We believe that many of these fish are far from steady state and that the rates of uptake (dietary and ventilatory) are the main factors controlling the levels of whole-body PCBs. For bioaccumulation, organismal lipid content is an important factor only for individuals at steady state and for chemicals that are not metabolized. While the numerator of the BSAF equation (lipid-normalized tissue concentrations) may not be an accurate indicator of bioaccumulation for fish in this study, we do consider the denominator (sed_{oc}) to be a reasonable indicator of the

bioavailable fraction from all sources available for uptake, which is primarily water and prey.

Determining a sediment guideline based on bioaccumulation

The determination of sediment concentrations that may result in adverse tissue concentrations can be accomplished with BSAF values (Meador 2006). For example, Meador et al. (2002) proposed that a tissue concentration of 2.4 μg tPCBs/g lipid was a protective tissue quality guideline (TQG) for salmonids. This TQG describes the 10th percentile of a variety of adverse biological responses for non-embryonic salmonids (fry to adult) that was compiled from several research studies. Using the BSAF (Eq. 2) and the TQG, we can solve for a sediment concentrations that should be protective against adverse effects. By examining the distribution of BSAF values observed in this study, we were able to determine sediment concentrations that could be used to protect a given percentage of the individuals. The values we provide in Table 4 would allow regulators to select appropriate percentile values that would be used to protect a given percentage of the population of outmigrant chinook salmon. For example, if the 90th percentile BSAF value was selected for chinook in the LDW, the sediment value to protect fish from bioaccumulating an adverse tissue concentration (≥2.4 μg/g lipid) would be 1.0 μg/g OC. The vast majority of juvenile chinook are from hatcheries and these fish move quickly through this estuary; however, it is the naturally reared juvenile chinook salmon that can spend considerable time in this system and likely accumulate high concentrations of PCBs and other contaminants that justifies this high percentage value.

The data we present here are just one example describing this application. Of course, several factors affect bioaccumulation and the BSAF, such as variable uptake and elimination rates, reduced bioavailability, reduced exposure, and insufficient time for sediment-water partitioning or tissue steady state. Because of these differences in bioaccumulation, a BSAF that is specific for a given estuary and species is recommended for a more accurate representation of bioaccumulation as a function of the above factors. Lipid content is also an important factor. Even though organismal lipid likely had little effect on the magnitude of bioaccumulation of PCBs for these fish (e.g., Stow et al. 1996), we believe that tissue lipids will be a factor in determining the toxic response. As proposed elsewhere (Lassiter and Hallam 1990), the lipid content of tissue controls the proportional availability of accumulated hydrophobic toxicants and therefore the magnitude of the toxic response, which is a factor we considered when developing the tPCB TQG for salmonids (Meador et al. 2002).

It is clear from these data that bioaccumulation of PCBs for a given area and time is highly variable. This is strong support for the importance of extensively sampling a given area at various locations and times to adequately characterize bioaccumulation, especially when considering population responses. These recommendations for other small estuaries include sampling in several locations, taking multiple samples over a species' potential residence time, and using a probabilistic approach for characterizing tissue concentrations that may lead to adverse effects. Obviously, a few composite samples from one or two randomly selected locations at one time period would severely underestimate the bioaccumulation potential for juvenile salmon as they rear in an estuary to accumulate mass and lipid stores before their first winter in open water. Additionally, these data indicate the importance of reducing sediment concentrations to effect reduced tissue concentrations to levels that are expected to be safe for fish and their prey. Assessing bioaccumulation in an iterative fashion after multiple rounds of sediment cleanup will provide needed information that remediation efforts are effective.

Acknowledgments We thank Sean Sol, Maryjean Willis, Mark Myers, O. Paul Olson, Gladys Yanagida, Dan Lomax, and Bernadita Anulacion for assistance with field collections, sample preparation, and analytical analyses. Jay Field and Lyndal Johnson provided several insightful comments on this manuscript.

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Comment # 12

O'Brien, Maura (ECY)

From: elizabeth.mooney@comcast.net
Sent: Monday, October 29, 2012 9:18 PM
To: O'Brien, Maura (ECY)
Cc: Ann Hurst; Janet and Bob Hays; Elizabeth Mooney
Subject: Kenmore Sediment and Water Characterization SAP 10-12-12 Comment
Attachments: rob k wharf calportland 1.jpg; Dioxin WA State source Assess-1-1.pdf; Meador et al. PCBs Duwamish Ecotox 2010.pdf; Meador AqConser 02 PCBs.pdf; rob k calportland wharf 2.jpg; rob k wharf calportland 1.jpg

October 28, 2012

Maura O'Brien
Department of Ecology

Dear Maura,

I believe that, in addition to your plans for the Kenmore Sediment and Water Characterization SAP 10-12-12:

DOE should force Calportland, Pioneer Towing, etc. to allow sediments on their property to be tested because there is reasonable cause to suspect they are contaminated and, furthermore, may be the source of contamination. The potential risk to public health necessitates prompt action.

You have enough evidence and I hope you could find more money from your agency or other state agencies, such as WADOT, to fund further testing. I am attaching evidence that contaminants probably are causing there to be a "take" during chinook fall migration up the Sammamish River (Cottage Lake wild population), that PCB's (found at Pioneer Towing and present in fish in Lake Washington) can cause harm to those fish, that Ecology is aware that cement is associated with dioxins (Dioxin WA State Assessment), that barges caused illegal turbidity in the head of the channel in the area of the Kenmore Navigation Channel AFTER I had warned Mr. John White that his project (SR 520 anchor/deck) should have an HPA BEFORE they translocated sediments. Mr. White said to me, "But, they (Calportland) have been barging."

My point, Maura, is that they (Calportland) has been barging and WSDOT knew it and they shouldn't have been barging and churning up sediment at the bottom of the lake for years without proper permits, but they were and now I would deeply appreciate it if DOE could persuade them of the need to test. I do understand that the process is going to take some time to solve, but it would help to have cooperation from all parties for testing.

I have a Master's Degree in Fisheries from UW, a BA in Philosophy from Pomona College and I'm President of PERK, People for an Environmentally Responsible Kenmore, and I served on the Citizens Advisory Committee for the Kenmore Shoreline Master Plan Update. Please respect my opinion as not only an academic, a mother, but also as a scientist who discovered, by myself, without your agency's full disclosure, the presence of high levels of dioxins at Harbour Village Marina. There was an ERTS call from DNR to DOE in Oct 2011, but your agency didn't disclose it, and yet your agency allowed this SR 520 project to proceed. I know our former city manager contributed to the project happening in Kenmore. Enough is enough. We see the project will proceed, but please test the area where there is strong reason to believe there may be a source of the PCB or dioxin contaminants, by Calporltand and the KIP site, in the sediments or when the barges/tugs are churning up the sediment. The DOE document I've attached has a section about how a cement facility may be associated with dioxins.

If the companies will not allow testing, then why should their barging be allowed if there is evidence of translocation of sediment in Lake Washington?

I am including two recent (last few months) photos taken by our new city manager showing evidence of the burned wharf at Calportland. My understanding is that burning may produce dioxins. Isn't it critical to test in this area? Would lack of testing here constitute a data gap in the study, and potentially call into question the entire integrity of the Kenmore Sediment and Water Characterization SAP analysis/testing plan-project?

Please amend the Sampling plan, if possible, to test in front of Calportland. There are other reasons I think this is important.

Calportland received special Shoreline Master Plan perks to change wording to their benefit, not the public's, in my opinion. My colleagues and I do not approve of the changes Calportland proposed, city approved and Dept of Ecology approved. I informed the city of dioxins that DOE already had learned about from DNR. The barging may impact our public health and ecology. The only way I can believe our public can be protected from possible dioxin contamination by turbidity from ongoing increased barge/tug alleged illegal turbidity and translocation of contaminants is by Dept of Ecology succeeding in convincing the companies that testing the sediments under water (shorelands) and/or water (during tug/barge activity) beside Calportland is a good idea. From these photos, you can see Calportland's "head of the channel"s sediments" might harbor a possible source of dioxins. If so, these contaminants may cause harm to federally protected species and human health. It would be stronger study if you could find a way to include Calportland's inner head of the channel in the testing.

Since the wharf was burned, since there are high dioxins at Harbour Village Marina, since the city is spending $100,000 dollars to test for a very coarse evaluation, and since the translocation of sediments under water continues with barge activity, please do your best for the citizens of Kenmore to persuade the big companies to allow your testing? You are the best person who can find a way to test. If the companies won't let your agency test, can you suggest the city recommend the companies stop barging until they do so?

Since water quality is DOE's responsibility and since WSDOT's project must follow the laws, and since it appears that the barges/tugs cause violation of water quality laws, if barging continues, then it would be great if testing where translocation occurs/occurred, should take place.

We don't want to risk waste of public money nor public health. This waterway appears to have been affected by translocation of sediment. So, here is evidence of fire on the wharf that DOE and the City of Kenmore told Calportland they would be able to expand (Dave Radabaugh and Jeff Talent?). I hope DOE could coordinate and achieve testing of sediment under water at Calportland/Pioneer Towing in the "head of the channel" where the burned wharf (possible source of dioxin) exists.

May you expand the testing to include the testing by Calportland since I believe there has been translocation of sediment in Lake Washington (my ERTS # 632786 March 2012)? The KGM and WSDOT operators should have acquired an HPA because it appears that there has been movement of bottom sediments. I asked WADOT to factor in that their barge activities would likely translocated sediments on the lake bottom and that it would require an HPA. They decided not to factor that into their SR 520 project, something I believe was not the right thing to do.

I have spoken to my friend Ann Hurst and she adds:
Often the tugs cannot turn the barges South without the tugs leaving the Kenmore Navigation Channel and gunning it next to Harbour Village Marina. The barges are too large and cumbersome for the design of the channel. The City told WSDOT that the barges would fit in the channel, WSDOT was told by Kiewitt/General/Manson that there would only be one barge per day and neither of those assertions were correct . Ecology, the State, has plenty of leverage to stop the barge traffic, and Ecology, then, to test the shore lands of Cal Portland and the Pioneer Towing Land. The Governor might even join in with Ecology to assert testing on those shore lands as she is plenty upset about the cracks in the pontoons K/G/M transported from Aberdeen. Even so, apparently, it is far easier to follow Water Quality Act barging from Aberdeen. There is precedent for Ecology to require the private companies pay for the testing.

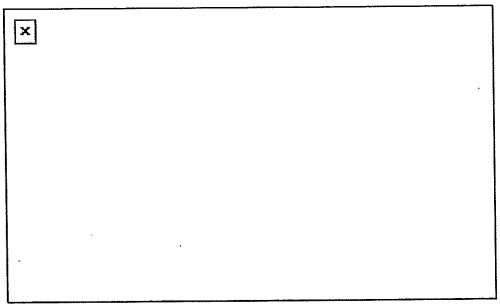
Elizabeth Mooney
Sent from my iPhone

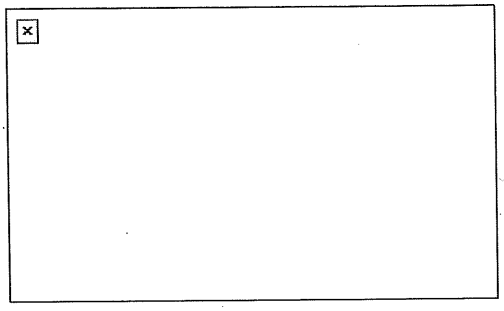
Begin forwarded message:

> **From:** Rob Karlinsey <rKarlinsey@kenmorewa.gov>
> **Date:** October 29, 2012 10:34:08 AM PDT
> **To:** Elizabeth Mooney <elizabeth.mooney@comcast.net>
> **Subject: RE: photo**
>
> Sorry I left before I saw your email. Here you go. From a distance these pilings look like they're just covered in dark creosote, but when you get up close, you can tell that a lot of it is charred from a fire.

From: elizabeth.mooney@comcast.net [mailto:elizabeth.mooney@comcast.net]
Sent: Saturday, October 27, 2012 11:38 AM
To: Rob Karlinsey
Subject: photo

Rob
If you have that photo, that'd be grand to have for tomorrow.
Thanks
Elizabeth





Comment # 13

O'Brien, Maura (ECY)

From: Mamie Bolender [mamiejb@hotmail.com]
Sent: Monday, October 29, 2012 10:55 PM
To: O'Brien, Maura (ECY)
Subject: Need for testing for dioxins at Kenmore/Lake Forest Park

Maura O'Brien
Washington State Department of Ecology

Dear Ms. O'Brien,

There is sufficient evidence that Dioxins are present to some eignificant degree in the waters off Kenmore which are being plied by barges which are disturbing the sediment of the region and causing these sediments and any toxins therein to be churned up and suspended in the water. These released sediments are being set free to float along and onto all the shores of North Lake Washington and beyond, contaminating the swimming beaches of Kenmore and Lake Forest Park and beyond. Dioxins are, inarguably, extremely toxic and detrimental to the health of our children and all who use these beaches for swimming and playing, but mostly the children. Unaware of this unseen danger, parents are allowing hundreds of children to be exposed to this hazard.

Extended testing must be done, and done soon, of the sediments along the north end of Lake Washington to determine the extent of migration of these sediments and the dangerous dioxins they contain.

Please cause this important testing to happen. The health of many children is at stake. This is a personal plea.

Respectfully submitted,

Mamie Bolender, mother, grandmother and co-president of the Lake Forest Park Stewardship Foundation

Comment #14

Sept 29, 2012
10:54

Dear Maura,

As you know I have worked diligently on keeping the waters of the State (Lake Washington and the Sammamish River for 5 years. I am not paid to do this and I do not have the credentials or the responsibility of your job. But some how I have chosen to invest my time and energy on ~~righting~~ documenting ~~the wrong~~ what I see occurring daily on the property called Kenmore Industrial Park since 2007. In that time I have made it my business to take pictures at least ~~one~~ a few pictures everyday that I have witnessed tug and barge after tug and barge come in and out. I have witnessed Gary Sergeant's lessees paint, weld, pump bilges into the lake, burn pallets on the shoreline and Glacier cement front load all their waste water from ~~those~~ cement trucks and surface water right into the lake directly into the head of the channel. I have document 3 years of Waterfront Construction fueling over the water from fuel trucks the equipment on

Lake Shore Marina Construction part large fishing boats out over the water,

I have sent you many pictures of these violations, when we brought the Clean water suit against Waterfront Construction. It was because you and the understaffed DOE did not enforce or question the owners of the property you just accepted their lies as fact. Waterfront Construction did not even have an NPDES permit when I began reporting to you what I was seeing and documenting. In fact as you said at a Belmont Master Plan Commission Sept 21 2009 meeting that the monitoring of the ground water [redacted] was never done for 8 years even though the consent decree stated your agency DOE was to oversee and enforce monitoring twice a year in wet and dry season. This did not occur until 2009 [redacted] a gap of 8 years. Your explanation to the commission was it fell through the cracks.

Now we have watched as BIG barges and tugs (still the same not

~~to~~ from the wharf you cannot test in front of because it is private property.

This wharf & the Cal Portland pier are being used as it is the only point of egress and ingress for this activity. The amount of sand and gravel barges has increased from 2 a week to 2 or three a day. The barge-tugs from Kiewit are not one per week, they are daily upto 16 loads when hauling barges filled with cement trucks. They continue to traverse out of the head of the channel ~~to keep the~~ out side of the buoys marking the channels width and boundary, hugging the shoreline directly in front of the North shore (Skip Davidson's Marina) and then make a sharp turn and gun their cargo either south or further west to docking stations. I have stood at the Kenmore air pier and Harbor Village pier taking pictures of the water which is so filled with sediment you cannot see 6 inches into it.

~~I~~ I do not understand how Cal Portland / Glacier / Tuyo - and

can be allowed to ~~[illegible]~~ opt out of this sediment ~~without~~ testing ~~[illegible]~~. Given the amount of dioxins found at Harbor Village. And the readings clearly showed it get worse the closer it is to the head of this channel.

Please consider [illegible] to test as close as you can get to this private head of the channel.

My concern is for my community and the environmental health not commerce as our Shoreline Master Plan's wording was changed from commercial to manufacturing. We the community are now finding out why. ~~[illegible]~~ is no longer able to recover from the sediments being shifted from the east end of the channel to the docking stations ~~[illegible]~~ even to ~~zig zagged to~~ the zigzagging and manuevers they have been doing to widen the channel and dredge it themselves with these big barges and tugs. No one is hearing us not because it isn't happening but because these property owners don't want to know.

Thank You

P.S. Sorry this is hand written [illegible] failing

P.S. I am not a scientist. This is from my heart and what I have witnessed, photographed and documented daily.

Thank you
Janet

Comment #15

O'Brien, Maura (ECY)

From: Jim Halliday [jimh@clearwire.net]
Sent: Tuesday, October 30, 2012 9:23 AM
To: O'Brien, Maura (ECY)
Subject: Sediment testing

Dear Ms. O'brien - I feel future liability risks should require DOE to force Calportland, Pioneer Towing, etc. to allow sediments on their property to be tested because there is reasonable cause to suspect they are contaminated and, furthermore, may be the source of contamination. The potential risk to public health necessitates prompt action.

Jim

Jim Halliday
206-365-1813
jimh@clearwire.net

Co-chair - Lake Forest Park StreamKeepers
Board member - Lake Forest Park Stewardship Foundation
LFP Liaison - People for an Environmentally Responsible Kenmore (PERK)
Board member - Sno-King Watershed Council