From: stephen mckenzie
To: Davis, Nancy D. (ECY)
Subject: WESTERN PORT ANGELES HARBOR, Site 11907
Date: Tuesday, January 14, 2020 8:09:01 AM

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Ms Davis,
RE: PLPs for Western PA Harbor clean up

As a property owner I am concerned for the economic well-being as well as the safety of the residents in Clallam County and Port Angeles. Can you explain to me why the burden of the cleanup is falling on the city and the present owners of contaminated property?

Isn't the contamination something that started decades before anyone knew to protect the environment? Unless the current owners have continued to intentionally pollute over the past 20 or so years it seems unfair for them to carry the burden of remediation. This is a public problem and the cost of cleanup should be born by all of the taxpayers in Washington state. How is this any different than the many Superfund cleanup sites across the country?

Naming the current owners and operators as potentially liable persons seems like your department is greatly overstepping its authority, arbitrarily placing economic burden on entities least able to afford it.

Please feel free to include this communication in your collection of public comments. I am sending this to you now because you're public comment mechanism is not yet in operation.

Stephen McKenzie
Owner of 1810 W 4th St, Port Angeles WA

Sent from my iPhone

RECEIVED

JAN 21 2020

WA State Department
of Ecology (SWRO)

January 16, 2020

George Titterness
97 Deer Trails Way
Sequim, WA 98382

Connie Groven
Cleanup Project Manager
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Re: Western Port Angeles Harbor Cleanup – Public Comment
Remedial Investigation and Feasibility Study
Facility Site ID: 18898
Site Cleanup ID: 11907

Ms. Connie Groven

Thank you for the Department of Ecology's effort to clean up the important environmental, cultural, and multi-use site known as Western Port Angeles Harbor. I would like to provide comments for your considerations on a location upland of the subject cleanup site but having the potential to affect the western harbor for years to come.

Shown on some old photos and waterfront maps, you can find a 50,000 gallon wood stave fuel tank located in the vicinity just north of the intersection of W Hill St and Marine Drive. This tank was removed decades ago. For many years, the tank provided fuel for the railroad that served timber related industries adjacent to the subject cleanup site. This wood stave tank leaked fuel oil into the surrounding soil for decades.

In 2003-04, a trench was excavated to a depth of 4 to 5 feet below ground surface in close proximity to the fuel tank site. The trench very quickly filled about a foot deep with a very odorous blackish-brownish gooey fuel oil/water emulsion. The trench was backfilled. I am not aware of any cleanup of this area.

If the 50,000 gallon wood stave fuel tank leaked between one percent and five percent of its volume, per year for twenty years, there could be 10,000 to 50,000 gallons of fuel oil

underground and slowly working its way to the harbor. There are several abandoned pipes and culverts on this former industrial site that can act as conduits to transport the goo to other parts of the area.

This area is a valuable historic and culturally sensitive site. Any consideration of cleaning up this area would likely require the consultation and participation of the Lower Elwha Klallam Tribe.

I urge the Department of Ecology to pursue the cleanup of the area surrounding the location of the former 50,000 gallon wood stave fuel tank. It is a toxic site in need of cleanup.

Sincerely,

George Titterness

George Titterness
97 Deer Trails Way
Sequim, WA 98382

George Titterness
97 Deer Trails Way
Sequim, WA 98382

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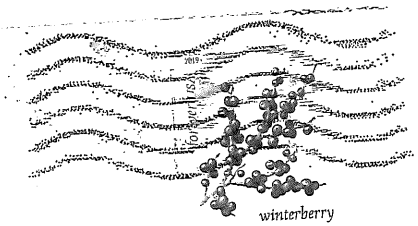
16 JAN 2020 PM 2 L



Connie Groven
Cleanup Project Manager
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

98504-7775

Anonymous Anonymous

This is an undue burden on taxpayers...to what end? The damage was done decades ago and time is the best solution at this point. Taxpayers are extremely weary and annoyed that unelected officials continue to drain our pocketbooks without voters having a say at the ballot box.

Anonymous Anonymous

On behalf of Karl Spees, M.D. (whose computer did not allow him to submit on this form), the following comment is submitted:

I am a scientist, a pragmatist, and a student of Natural history.

I will accept the premise that the historical PA Industries were producing some very toxic wastes at one time which they deposited in the harbor.

In today's Peninsula Daily News we have some public official who has come up with a reasonably expensive (multi-million dollar) solution to assuage the guilt trip the DOE has laid on the current inhabitants of Port Angeles. (Minimal improvement of the real problem but at a very large expense to the current general public.)

Here is the reality. Mother Nature has a phenomenal ability to heal herself. The best solution to a defiled-environment is to quit doing the destructive activity. Time heals all (mostly). The defiling of PA harbor has ceased many decades ago. Most of the problem has eroded away, been diluted, or has been embedded in a layer of silt. Ten thousand years from now the PA pollution of the 50's, 60's and 70's will be a thin line in a sedimentary mud or rock which is part of a mountain or ridge. (OK the layer could still be in some ocean location.) (Mother Nature herself has deposited some toxic materials in rock formations.) The bottom line is that if we 'do nothing', the crabs and shrimp of PA harbor will be nontoxic and edible. The Salmon traditionally bypass the harbor going to sea and returning. Doing it for the Salmon (or the children) is just emotional gibberish, blackmail. (The real reasons for our salmon resource's precipitous decline is a politically-incorrect cause which is unmentionable in bureaucratic circles.)

The Pragmatic Solution to our polluted PA Harbor is to 'do nothing'. "Stop the damaging behavior and "DO NOTHING!" Nothing will be lost and the problem which has already virtually disappeared will continue to be less of an issue.

Of course this policy will not satisfy the DOE, which makes this proposal unacceptable. (The DOE is about politics and control not acting on behalf of the WA State Citizens and the Environment.)

Karl Spees, M.D., Student of Natural History

February 29, 2020

Connie Groven
Cleanup Project Manager
Southwest Regional Office
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Re: <u>Western Port Angeles Harbor Cleanup RI/FS</u>

Ms. Groven:

I would like to provide comment regarding the draft Western Port Angeles Harbor cleanup plan, officially the Remedial Investigation/Feasibility Study. To provide context, I retired from the Port Angeles police chief position in March 2016. Perhaps more importantly. I am a member of a pioneer family that settled in the Clallam County area circa 1887.

As you no doubt know the plan was produced through a cooperative effort between the five Potentially Liable Persons (PLP's): City of Port Angeles, Port of Port Angeles, Merrill & Ring, Nippon Paper Industries, and Georgia Pacific. It is the result of more than ten years of study that involved extensive public outreach and includes protections for important cultural and ecological resources.

I am not qualified to speak to the science behind the document. I can, however, speak to the integrity of the process and the commitment of those involved in producing the draft plan. The RI/FS is a serious effort on the part of the PLP's to identify an economically viable path to a healthier Port Angeles harbor.

I am pleased to add my name to the list of those in support of the draft RI/FS as proposed.

Respectfully,
S/Terry Gallagher

JIM HAGUEWOOD

Comment – Western Port Angeles Harbor Sediment Cleanup Unit – Remedial Investigation/Feasibility Study (RI/FS) and Amendment to the Agreed Order

Comments by Jim Haguewood, resident of Port Angeles

I support the RI/FS that has evaluated a range of cleanup alternatives for the subareas and provides the greatest degree of benefits, including protection of human health and the environment, within in a reasonable timeline and cost.

The preferred cleanup plan is a result of over a decade of study. A group of five public and private entities have worked cooperatively with the Department of Ecology to agree to a science-based plan that is cost-effective, using a proven implementation approach and meets the requirements of the Model Toxics Control Act, RCW Chapter 70.105D.

In the best interests of the citizens of the State of Washington and most importantly the residents and visitors of Port Angeles, please move this clean-up plan forward and get the job done.

Roberta Mantooth

Please give serious consideration to the comments from Olympic Environmental Council based on analysis by its technical consultant Dr. Peter deFur, which OEC has submitted to you. The harbor is important to the well-being of our economy and ecology. Friends of Ennis Creek wants to be confident the fish that spend time in the harbor and their food sources in that area will not be contaminated.

James Mantooth

Please give serious consideration to the comments from Olympic Environmental Council based on analysis by its technical consultant Dr. Peter deFur, which OEC has submitted to you. The harbor is important to the well-being of our economy and ecology. Friends of Ennis Creek wants to be confident the fish that spend time in the harbor and their food sources in that area will not be contaminated.

DEPARTMENT OF NATURAL RESOURCES

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PO Box 47027
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360-902-1100
ARD@DNR.WA.GOV
WWW.DNR.WA.GOV

March 13, 2020

Ms Connie Groven
Department of Ecology
Southwest Regional Office
300 Desmond Dr SE
Lacey, 98503-1274

Subject: Western Port Angeles Harbor RI/FS

Dear Ms. Groven:

The Washington State Department of Natural Resources (DNR) would like to thank you for the opportunity to comment on the Remedial Investigation/Feasibility Study for the Western Port Angeles Harbor site.

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

-The document as a whole relies on large amounts of information that is presented primarily in appendices; adding additional summary information in the main text to reduce the amount of cross referencing required would make the document more accessible.

-Engineered caps are a major component of the selected remedy for SMA 1, primarily on State-Owned Aquatic Lands. Because engineered caps typically require institutional controls that may encumber future uses of SOAL, including restrictions on anchoring, they require authorization from DNR. This authorization will be necessary for not only the cap itself but for ongoing maintenance and monitoring for the lifetime of the cap.

-Additionally, much of the area where capping is to be performed is used for industrial and port activity. The proposed method of management of the risk of damage to the cap from scour, anchoring, and other activities, including eventual replacement of improvements at the end of life, is not clear. Additionally,

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given the depositional nature of the inner harbor, will it be possible to maintain navigational depths over time if potential dredging is restricted by the presence of a cap?

-No action areas defined by a 50 foot offset from overwater structures also coincide with much of the areas of potential scour in SMA 1. Contaminated sediments in these areas could be mobilized and contribute to recontamination of the capped area. While DNR understands the practical infeasibility of dredging and engineered capping in these areas, some alternatives, such as ENR with or without amendment by activated carbon, should have been considered.

-While much of the harbor passed bioassays for toxicity, there were bioassay failures in the SMA1 and SMA2 areas. These are the areas of some of the heaviest wood waste accumulation as well as the highest porewater sulfides, suggesting that in these areas anaerobic decay of wood waste is still ongoing. If a cap is constructed, monitoring for the upwelling of sulfides from anaerobic decay of wood waste should be conducted in those areas.

-Limitations on sediment disturbing work in the cap area will also inhibit creosote piling removal efforts; creosote pilings are specifically cited as a source control issue. DNR is concerned about recontamination from these pilings and the appropriateness of a cap that would restrict that source control work.

-Due to the small size of the removal portion of the preferred remedy, the vast majority of contamination on SOAL will remain in the environment. It is not clear that the amount of removal of contaminated sediments would truly meet the public desire to reduce risks from ongoing contamination by removing contamination from the harbor, particularly with respect to the potential for damage to the cap during normal activity in the harbor.

-Since source control will be administered through other Ecology programs, it would be helpful to have an overview of how coordination between source control and cleanup will be conducted for this site.

-The remedy selection rationale for SMA 2 included the limits on access to the area because of its location on private property; however, it is connected to the harbor via the channel, which is also a no action area. Additionally, there is not sediment data from the channel, so its sediment quality is unknown. How will the potential for this to be a source to areas that do have public access in the harbor be limited?

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Ms. Connie Groven

March 20, 2020

-The channel between the harbor and lagoon, terminal berthing areas, and sections of erodible shoreline are all cited as potential sources of contamination, but are all considered to be part of no action areas. These sources do not appear to be sufficiently addressed in a source control evaluation. Additionally, much of these areas are considered to be areas of direct contact exposure and/or sessile seafood exposure, presenting a risk to the public who may access the areas for recreation or fishing activities, either at present or in the future.

Sincerely,

Erika Shaffer
Sediment Quality Unit

Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775
Attn: Connie Groven
Cleanup Project Manager

2020-03-06

Re: MPC Comments on RI/FS Port Angeles Harbor

Ms Groven,

We at McKinley Paper Company ("McKinley") write concerning the remedial investigation and feasibility study (RI/FS) for the western Port Angeles Harbor (FSID # 18898; CSID # 11907), released January 16, 2020 for public comment.

McKinley is the owner of private property within the area studied in the RI/FS, including what is called the "lagoon," so we have a special interest in what the RI/FS proposes, especially for work proposed for the areas on and near our property.

McKinley is at a critical stage of re-starting pulp and paper production at its mill on the western Harbor. Since McKinley bought the mill in Port Angeles in 2017, we have designed and installed a complex and expensive processing system to re-configure and re-start the mill using recycled paper exclusively. In addition to meeting the state's need for consumption of recycled paper and production of eco-friendly paper, the restart allows McKinley to employ workers skilled in paper production in jobs that add great benefit to the local economy. We are currently in the process of resuming paper production as we write this.

Our re-started mill operations require that we operate on or have uncompromised access to literally every square meter of our property, which is already geographically constrained. Our mill will require truck shipments into our mill of recycled paper including old cardboard and outbound shipments from our mill of our paper products. This requires free-flowing truck access along Marine Drive and within our mill facility, including the ability to route truck traffic to avoid waits and delays. We will be operating 24/7 and 365 days per year.

7850 Jefferson St NE #150
Albuquerque, NM 87109
505.224.2300

1815 Marine Dr
Port Angeles, WA 98363
360.565.7070

County Rd. 19
Prewitt, NM 87045
505.972.2100

For these reasons, we write to urge the Department of Ecology to accept the preferred cleanup remedies proposed in the RI/FS for the sub-areas, called sediment management areas (SMAs). They are consistent with the state environmental cleanup regulations.

McKinley is opposed, however, to more extensive work that is not necessary to protect human health and the environment and that could impede or interfere with our re-started mill operations. While we are concerned about the extent and impact of the proposed intertidal excavation and capping described in the preferred alternatives for the SMAs, we know that if the areas to receive that treatment were to increase or the work required were more intrusive, it would have an adverse effect on our operations of the mill. While impacts to operational efficiencies are a primary consideration, we are also very concerned about public and worker safety, given the volume of truck traffic that will be moving in and out of the mill for paper production.

We ask that Ecology please accept this public review draft of the RI/FS and allow this process to move on.

Feel free to contact me if you have any further questions or comments on the matter.

Best regards,

Wilfrido Rincón
Managing Director
Bio-PAPPEL | McKinley Paper USA
rinconw@biopappel.com

munro llc

Comments for Facility Site ID:18898
Site Cleanup ID: 11907

Connie Groven
Cleanup Project Manager
SW Regional Office
Dept. of Ecology

Dear Sirs:
I am wishing to comment on the Western Port Angeles Harbor Cleanup project. I have been actively involved in this community for over 30 years with time spent on the City of Port Angeles Council as well as a board member on many significant organizations in this community. Thus I believe that I speak as a well informed member of this community.
It is critical that this project move ahead in the current preferred cleanup alternative and schedule. We have watched as so much time has been wasted with the Rayonier cleanup project where an important site is tied up and not contributing to the local economy. The preferred alternative gets this project done expeditiously , in a reasonable cost to the companies involved, and without further harm to the environment.
I support moving ahead quickly with the currently suggested preferred alternative.

Sincerely,
Grant Munro

The Remediators Inc

Department of Ecology
Connie Groven
Cleanup Project Manager
Southwest Regional Office
P,O. Box 47775
Olympia, WA98504-7775
Re: Port Angeles Harbor Cleanup Site Cleanup ID 11907
The preferred cleanup remedies of intertidal excavation, intertidal capping and the final selection of cleanup actions under consideration are intended to provide for the long term safety of the public and restoration of the environment in the most comprehensive and cost effective way. The modern bioremediation technologies we employ have been reviewed and approved by the EPA and the California Department of Toxic Substance Control. We have many successful projects in Superfund Sites, large industrial cleanup sites and private cleanup sites in 8 states within the lower 48 states and Alaska with several more beginning this year. The Integrated Biological Approach to bioremediation used by us and project partners at NASA/Ames Research Center relies on a combination of plants, microbes, and fungi for remediation of mixed contaminants of soil and groundwater. The technology combines patented plant/microbe pairings originating from and licensed through the University of Washington Forest Science Laboratory with fungi from our library of thoroughly tested fungal strains for remediation use. This process can deconstruct organic toxins completely as well as remove inorganic toxins and metals and concentrate them within the plant tissue effectively and at less cost than most other remediation technology. A trial using specially prepared biochar made for use within a thin-layer sand cap trial conducted from the Ashland Chemical Superfund Site on Lake Michigan outperformed 'Sedimite' and Granulated Activated Carbon (GAC), both for prevention of migration of toxins as well as providing a restorative function to the cap. These technologies are flexible, efficient, and restore the sites they are used on to a healthy condition. By combining these technologies as appropriate we are able to treat hard to treat as well as mixed contamination simultaneously with visible improvements to the site, often with minimal disturbance to the ground through our specialized application methods.Information on specific contaminants, site specific treatments, and supporting validation literature will be provided on request as well as presenting a sysnopsis of our previous and ongoing work.The addition of these technologies within existing treatment options provided for in the Port Angeles Harbor Cleanup will ensure that when completed the contamination is not simply covered up, rather the site is clean and restored to a healthy safe condition.

Ashland Laboratory Study

Estimation of Floatable Sheen from Sediment Disturbance and Sand Cap Efficacy Studies

Meg Pinza, Jay D. Word, Jack Q. Word

9/22/2011

Results of the laboratory trials indicate that a floatable sheen will be produced during any sediment removal project and mitigation controls should be instituted. All cap treatments prevented breakthrough of contaminants to sediment surface but the amended sand treatments of biochar, granular activated carbon and SediMite™ (in that order) prevented vertical migration of contaminants better than the unamended sand cap.

Mycoremediation and the Integrated Biological Approach

Mycoremediation of Environmental Pollutants

Petroleum based contamination of soil and water are a major threat to the health of our ecosystems and human heath. Cleanup costs for these often hard to treat contaminants have imposed an enormous financial burden on society with negative effects on land values. As a standalone treatment for petroleum contamination mycoremediation has achieved 'non-detects' in as little as a few months' time. The fungal metabolization of hydrocarbons creates no toxic waste stream with carbon dioxide and water being the final product of decomposition. Mycoremediation in an integrated bioremediation system represents the state of the art in bioremediation technology. We combine the use of specifically selected fungal treatments with phytoremediation plant / microbe combinations that have been proven successful in field applications to treat a variety of pollutants. This newly developed approach allows an effective solution for a broad range of organic and inorganic pollutants as well as being the least costly.

Fungi are natures' recyclers. They secrete enzymes into their environment that break down organic compounds. These compounds are chemically broken down into simpler ones which then become available to the growing fungi and other organisms. The degradation of lignin and cellulose are primary sources of energy for most fungi and lignin is a natural analogue of petroleum based hydrocarbons. Fungi can degrade a variety of petroleum hydrocarbons including aromatic (PAHs, dioxins) and chlorinated (PCBs, DDT) compounds. Enzymes responsible for this can likewise deconstruct inorganic compounds and metals which then become available to microbes and plants within our combined bioremediation systems.

Mycelium, where mushroom meets toxin. Mycelium, the rootlike structure that comprises the bulk of these fungal organisms, exist in an interconnected web of microscopic threads called hyphae that penetrate their environment. A gram of healthy soil can contain hundreds of meters of fungal hyphae. Fungal growth is dependent upon nutrients and minerals that the mycelium encounters that are degraded by enzymes secreted by the mycelium and then reabsorbed as their primary food source. It is in and around the mycelial network that the remediation occurs. Our Mycoremediation treatments consist of live fungal mycelium in cellulosic carriers optimized to meet specific project needs.

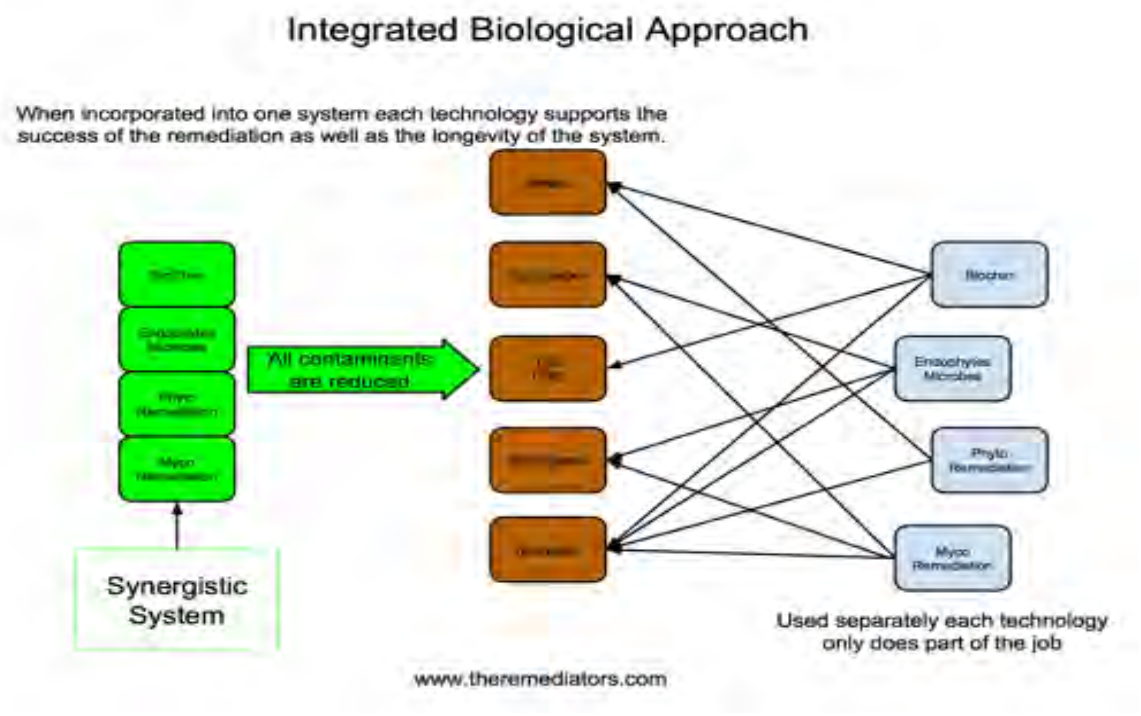
- Eliminates the need for offsite disposal of soil.
- There are no downstream negative effects from the process. The conversion of toxins transforms them to mostly CO2 and Water.
- MycoRemediation A "Green" technology. The materials used can be helpful in restoring soil health.
- The decontaminated soils may be reused, or left in place as an in-situ process.
- Minimal monitoring and no mechanical infrastructure.

Each fungal strain is thoroughly tested for the ability to decontaminate a range of toxins and for growth under different conditions.

Our process has been used successfully in the United States and Canada in the remediation of petroleum hydrocarbons and was approved by the US Navy's Facilities Engineering Service Center (NFESC) as an innovative technology suitable for their environmental program.

A Living Partnership: The Integrated Biological Approach.

Soil bacteria grow and travel in the film surrounding the mycelial hyphae more efficiently than in soil or water without hyphae, giving these microbes direct access to their food source. These interactions also support the transfer of genetic material within these populations which supports greater diversity and vitality. These factors translate to more rapid decomposition of toxic compounds that are also made



accessible for uptake into the roots of plants used in the remediation. The partnership between fungi, soil bacteria, and hyper accumulating plants allows for the successful treatment of many hard to treat toxins as well as increasing the performance of each component of the system. The Integrated Biological Approach is our remediation 'toolbox' and constitutes latest state of the art of bioremediation.
For effective and affordable treatment of contaminated soil, sediments and water feel free to contact us for more information.

The Remediators Contact:

Howard Sprouse CEO
The Remediators Incorporated
Email hsprouse@theremediators.com 1-773-609-2427
Website www.theremediators.com

TABLE 9 SUMMARY OF TOC/TC AND TOTAL SOLIDS DATA

Core	Sand			SediMite™			Biochar			GAC		
Depth	TOC	TC	TS	TOC	TC	TS	TOC	TC	TS	TOC	TC	TS
0-1				0.02 U	0.02 U	76.0	0.02 U	0.02 U	78.7	0.02 U	0.02 U	77.8
1-2				0.02 U	0.02 U	76.2	0.02 U	0.02 U	77.3	0.02 U	0.02 U	78.1
2-3	0.02 U	0.02 U	73..3	**7.28**	**7.30**	72.5	**5.47**	**6.21**	77.6	**12.0**	**12.9**	75.4
3-4				0.02 U	0.02 U	76.6	0.028	0.022	77.2	3.44	4.11	77.0
4-5				0.02 U	0.02 U	75.5	0.02 U	0.023	77.0	0.02 U	0.024	77.2

In addition to physical analysis, the deepest section of each core was analyzed for SVOCs to establish if the contaminant layer was migrating through the cap. The results of this analysis are provided in Table 10. The SVOCs were detected at a much higher concentration in the sand cap (10,590 ug/kg dry wt.) than the amendments. All of the amended sediment had reduced concentrations of SVOCs compared to the sand cap by at least 25 and as much as 50-fold. Biochar appeared to be the most efficient at reducing the migration of the contaminated layer followed by GAC and then SediMite™ (approximately half the concentrations observed in the other amended sand cap treatments).

The dominant compounds within the different treatments changed depending on treatment type; phenanthrene was found at the highest concentration in the sand, GAC, and biochar treatments whereas naphthalene compounds were the most dominant in the SediMite™ treatment. This observation may be related to SediMite™ pellets moving somewhat vertically through the cap and absorbing or entraining the contaminants. In any case, the sand cap had higher concentrations of contaminants than any of the amended treatments; therefore if the restorative layer is selected as the preferred option for the Ashland waterfront site, the restorative layer should include the addition of an amendment.

CONCLUSIONS

The summary findings as a result of laboratory studies conducted on selected cores from Chequamegon Bay, Lake Superior are:

1. There is a distinct silty sand contamination layer of free floating product mixed with pebbles varying in depth from approximately 1 ft to 3 ft below the sediment surface depending on the station location. This layer is comprised of PAH compounds similar to sediment samples collected from URS in 2001; most likely derived from petrogenic sources related to on-shore activities. *Based on boring logs advanced both on shore at Kreher Park and off shore in the bay sediments, this sandy material corresponds to granular materials underlying the wood chip/ reworked sediments at varying depths from elevation 591 to 595 msl. This granular unit is in turn underlain by soft to firm silts and/or stiff to hard clay. At some sediment sample points contaminants have penetrated the silt. Monitoring wells screened in the sand at the shoreline have historically encountered both dissolved and more recently free-phase hydrocarbon. Prior to initiating any sediment dredging or removal operation, the granular materials at Kreher Park should be contained*
2. The measured PAH compounds within the contamination layer are mobile and move within the sediment column both in an upward as well as downward direction.
3. The PAH compounds will migrate from the sediment to the water surface during dredging operations (4% of measured compounds were found in the elutriate preparations). *Mitigation measures such as containment booms should be employed to address floatable products that will surface during dredgi*ng. Under this method at least 4% of the contamination in the sediment will be mobilized to the surface of the water.

4. The concentrations in the sand cap were more than fifty times as high as the biochar treatment and more than 20 times higher than the GAC or SediMite amendment. *A restorative layer should include a sand cap amended with a carbon source. Additionally, the biochar amendment appears to enhance the carbon nutrient quality of the sand which could promote more rapid recolonization of the returning benthic community.*

TABLE 10 SUMMARY RESULTS FOR SEDIMENT CORES

Analyte *(conc. = ug/kg,dry)*	**Clean sand**	**SediMite™**	**Biochar**	**GAC**
Phenol	< 60	< 63	< 64	< 64
2-Methylphenol	< 60	< 63	< 64	< 64
4-Methylphenol	< 60	< 63	< 64	< 64
2,4-Dimethylphenol	< 60	< 63	< 64	< 64
Naphthalene	**84**	**270**	< 64	< 64
2-Methylnaphthalene	**780**	**130**	< 64	**80**
1-Methylnaphthalene	**580**	**96**	< 64	< 64
Dimethylphthalate	< 60	< 63	< 64	< 64
Biphenyl	**120 J**	**12 J**	< 64	< 64
Acenaphthylene	< 60	< 63	< 64	< 64
Acenaphthene	**1200**	< 63	< 64	< 64
Dibenzofuran	**77**	< 63	< 64	< 64
Diethylphthalate	< 60	< 63	< 64	< 64
Fluorene	**520**	< 63	< 64	< 64
Pentachlorophenol	< 300	< 320	< 320	< 320
Dibenzothiophene	**120 J**	< 63	< 64	< 64
Phenanthrene	**2100**	< 63	**140**	**160**
Carbazole	< 60	< 63	< 64	< 64
Anthracene	**550**	< 63	< 64	< 64
C(1)-Ph/An's	**920 J**	< 63	< 64	< 64
Cyclopentaphenanthrene	**180 J**	< 63	< 64	< 64
Di-n-butylphthalate	< 60	< 63	< 64	< 64
Fluoranthene	**620**	< 63	< 64	< 64
CyclopentaPh/An	**240 J**	< 63	< 64	< 64
Pyrene	**990**	< 63	**72**	**86**
Butylbenzylphthalate	< 60	< 63	< 64	< 64
Benzo(a)anthracene	**270**	< 63	< 64	< 64
bis(2-Ethylhexyl)phthalate	< 60	< 63	< 64	< 64
Chrysene	**250**	< 63	< 64	< 64
Di-n-octylphthalate	< 60	< 63	< 64	< 64
total Benzofluoranthenes	**240**	< 63	< 64	< 64
Benzo(a)fluoranthene	**70 J**	< 63	< 64	< 64
Benzo(e)pyrene	**140 J**	< 63	< 64	< 64
Benzo(a)pyrene	**240**	< 63	< 64	< 64
Perylene	**40 J**	< 63	< 64	< 64
Indeno(1,2,3-cd)pyrene	**89**	< 63	< 64	< 64
Dibenzo(a,h)anthracene	< 60	< 63	< 64	< 64
Benzo(g,h,i)perylene	**120**	< 63	< 64	< 64
Anthanthrene	**50 J**	< 63	< 64	< 64
Sum of detected SVOC	**10590**	**508**	**212**	**326**

RESTORATIVE LAYER RESULTS

The restorative layer experiment was initiated on 5/15/11 and the experiment was terminated on 7/14/11. One hundred grams of contaminated sediment created from contaminated sections typically 13 inches or more below the sediment surface from several stations was used as a worse case residual material. The test aquaria were monitored daily for signs of any contaminant breakthrough of the sand cap including visual observance of product either floating on water surface of present in the sediment, any noticeable odors representative of petroleum, and the volume of water passing through the system was measured daily.

GENERAL OBSERVATIONS

A lighter colored sand layer approximately 0.25 inches in thickness was observed in all of the treatment tanks at the surface of sediment layer. This lighter colored layer is thought to be associated with the finer sand particles settling out of the sand surface. Over time green and red algae were observed in most treatment tanks; the biochar treatments had the most predominant growth.

SediMite™

A SediMite™ pellet was noted on the surface of one tank approximately one week after the start of the experiment. This pellet migrated up through the sand cap from the three inch depth. Additionally, there was a noticeable upward migration pattern from the SediMite™ layer towards the surface of the sand cap. This pattern was noted for all three treatment replicates and is illustrated in Figure 13.

FIGURE 13 SEDIMITE™ VERTICAL MIGRATION PATTERN, PELLET ON SURFACE

BIOCHAR

The biochar treatments all showed a black cloud pattern diffusing in all directions from the three inch layer (Figure 14). Algal growth was most prevalent in biochar treatments in association with the black cloud pattern which may indicate that this amendment has the most available carbon to promote more rapid benthic recolonization of the cap.

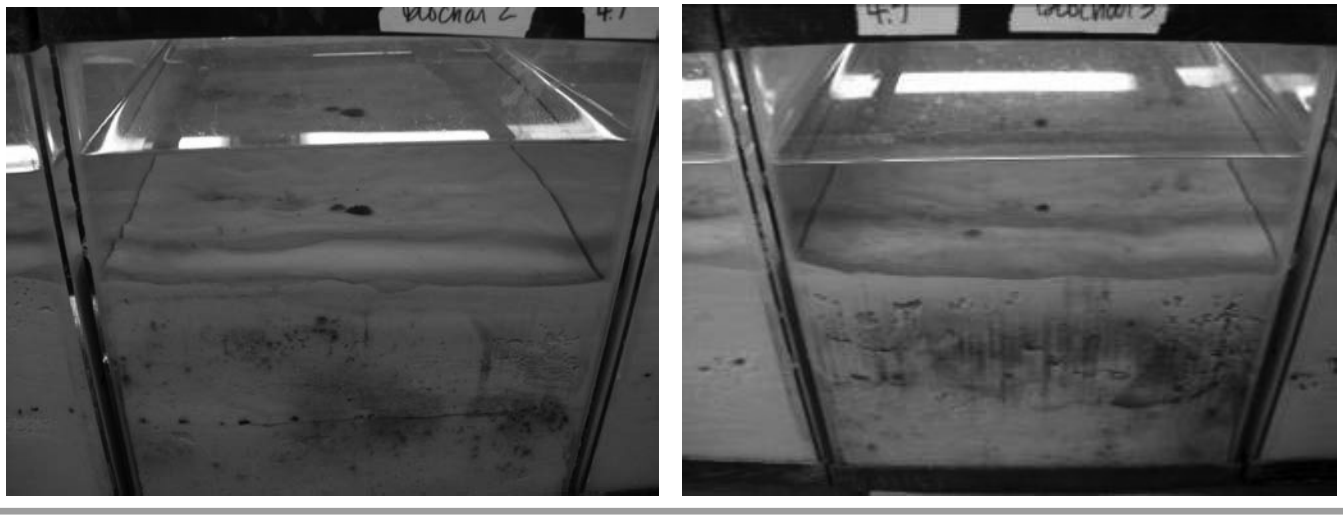


FIGURE 14 BIOCHAR DIFFUSION PATTERNS AND ALGAL GROWTH

Granular Activated Carbon (GAC) – Pellet Form

The GAC treatments had no vertical movement from the three inch depth layer as shown in Figure 15. There was also no observed algal growth associated with any of the GAC replicates.

FIGURE 15GAC TREATMENT REMAINS AT THREE INCH DEPTH INTERVAL

Oil and Gas Endophyte-Enhanced Tree Phytoremediation plus Mycoremediation

Crude oil and gas pollution originate from many sources and can include activities such as unintentional spills of organic pollutants, leaking storage tanks, and oil and gas exploration, extraction, and transportation that can contaminate soils and sediments, groundwater, and surface water. Traditional cleanup of petroleum hydrocarbon pollutants is costly, not only financially but also environmentally. In some cases, traditional remediation treatments are unsuccessful at removing a sizable portion of pollutants that were accidentally released into the environment. In other cases, low, yet reportable, levels of recalcitrant petroleum hydrocarbon pollutants persist after initial cleanup, making it difficult to close sites. Our team provides remediation assessment, direction and new solutions to assist in the stabilization and remediation of these contaminants from polluted environments, and the mitigation of risks associated with these sites. Intrinsyx and PPCU utilize poplar tree-endophytic bacteria in many different groundwater loving trees combined with the Remediators fungal soil mycelium to effectively remove and degrade petroleum hydrocarbon pollutants (BTEX, TPH, PAH's, etc.) in groundwater and soil using a combined poplar tree phytoremediation and mycoremediation system.

Advantages of using plants inoculated with endophytic bacteria that degrade petroleum hydrocarbons.

Trees inoculated with our highly-specialized bacteria significantly increase the degradation of petroleum pollutants in soil and water by as much as 40% versus controls containing un-inoculated plants, and considerably more than no treatment at all. In addition, plants containing these specialized endophytic bacteria have demonstrated higher root and shoot growth as well as no signs of phytotoxic effects from petroleum pollutants, even at traditionally phytotoxic concentrations. In fact, these endophytic bacteria even facilitate increased uptake of pollutants into the plant tissues for degradation, which is especially important for recalcitrant hydrocarbons. In the image shown above, willow trees were inoculated (left 3 trees), or un-inoculated (right 3 trees), and grown in soil containing phytotoxic concentrations of phenanthrene (Khan et al. 2014). Thankfully, these specialized endophytic bacteria can be used with any plant species, and the inoculation of plants can occur at the time of planting or on established trees, shrubs, herbs and grasses!

Plant endophytic bacteria that degrade chlorinated solvents and pesticides.

Some petroleum hydrocarbon impacted sites also contain chlorinated solvents or persistent organic pesticides, or even explosives! In addition to our petroleum hydrocarbon degrading poplar endophytes we have tree endophytes that degrade chlorinated molecules and explosives like TNT and RDX.

Soil mycoremediation. Fungi naturally breakdown organic compounds from the soil in which they reside. They inherently degrade a variety of petroleum hydrocarbons including aromatic (PAHs, dioxins) and chlorinated (PCBs, DDT) compounds. Degradation of these organic pollutants results in the creation of water and carbon dioxide, leaving no contaminants behind. In addition to the degradation activities of these beneficial fungi for remediation of organic pollutants, they also provide benefits to the plants used for phytoremediation by helping to make mineral nutrients more bioavailable as well as confer greater environmental stress tolerance to biotic and abiotic factors.

Combined Tree Bio-Phytoremediation and Mycoremediation Applications. Combining endophyte-enhanced phytoremediation with mycoremediation has the potential to dramatically increase the remediation efficiency and effectiveness of organic polluted sites over any other green technology on the market; and, this system is vastly less expensive than traditional remediation approaches. Our system is designed to work together to increase remediation efficiency from the time of implementation to closure and reduces the total time to remediate using biological organisms. To top it all off, the technologies discussed in this paper are isolated from nature and are completely safe to humans and the environment, and do not require specialized permitting for use. Many sites we encounter are contaminated with multiple pollutants and we have found that this multifaceted approach is ideal because we can address multiple contaminants of concern concomitantly.

Our endophytic plant bacteria and soil fungi are compatible with most plant species. That means we can customize our remediation approach specific to the site's geographic region, site conditions, chemical characteristics, and depth of pollutant(s). Plant selection can take into consideration any desire for native plants as well as future plant biomass use for timber or bio-fuel related applications. This combined system allows us to address multiple pollutants at many depths. We can address:

- Soil contamination at shallow depths and deeper due to the trees
- Groundwater contamination at 30 feet below ground using high-transpiration water loving trees. Trees like Poplar, Willow, Ash and Alder are quite useful in this regard. These trees generally grow in freshwater aquifers where the water table depth is not more than ten meters.
- Aquatic systems requiring water and/or sediment remediation

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CLEANING UP THE CLEANUP

MPC Brings Sustainability to Environmental Remediation

Environmental remediation involves removing contaminants from water and soil to protect human health and restore the environment; however, certain remediation activities can generate emissions or other waste products that impact the environment. MPC is moving to the forefront of the oil and gas industry with plans for a new company-wide approach to remediation projects that incorporates a sustainability evaluation.

The trees planted at the Alaska site support phytoremediation, which relies on the natural processes of plants and trees to mitigate the effects of contaminants.

Framing the Bigger Picture

The program's foundation is an assessment that identifies opportunities for reducing a project's anticipated amount of greenhouse gas, air emissions, energy use, waste, water use and raw materials. This can lead to switching remediation technology, exploring greener options in the supply chain or introducing new habitat features. The assessments aim to go beyond environmental concerns to address the broader potential of this work to positively affect surrounding communities.

"We are looking to factor in stakeholder inclusion and evaluating software tools that could gauge economic and social factors for more complex sites," said Kyle Waldron, HES professional in Environment, Safety, Security and Product Quality (ESS&PQ). "Considering economic and social factors may allow remediation projects to provide value to the local community through the use of low-impact solutions and by identifying reuse opportunities for the remediation resources."

This tactic is expected to help shorten the use of mechanical systems at the site by at least seven years, adding to the benefits of using more energy-efficient equipment for other tasks. Together, these measures are calculated to reduce carbon dioxide (CO_2) emissions during the project's lifecycle by roughly 90 tons, which is equivalent to the energy use of 10.8 average homes in one year.

Advantages Made in the Shade

In developing its sustainable remediation program, MPC is conducting pilot testing at two company remediation sites. It is also drawing upon successful initial results from a remediation effort at a former Andeavor fuel terminal in Alaska. This undertaking has shown sustainability can create substantial cost advantages, especially when it includes planting trees (phytoremediation) to mitigate the effects of petroleum contaminants. Remediation has added 550 balsam poplar trees to the three-acre site.

"Prior to planting the trees, they were inoculated with specific bacteria that have the ability to degrade the contaminants of concern at the site," Waldron said. "When the trees are fully mature after approximately four years, they will take up groundwater at a rate that significantly reduces groundwater flow across the site, and treat the water through their natural processes, eliminating the expense of operating a mechanical pump and treatment system."

Port Angeles Hardwood LLC
333 Eclipse Industrial Parkway
Port Angeles, WA 98363

March 3, 2020

Connie Groven
Cleanup Project Manager
Southwest Regional Office
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Re: Comments, Western Port Angeles Harbor Cleanup
Facility Site ID: 18898
Site Cleanup ID: 11907

Dear Ms. Groven:

Port Angeles Hardwood is a thriving company that provides high quality Alder, Maple, Cottonwood and Birch hardwood lumber for furniture and cabinet industries worldwide. Our Port Angeles facility has 72 full-time employees and is dependent on a healthy, functioning Port Facility for delivering logs to supply our mill.

We have reviewed both the Remedial Investigation/Feasibility Study (RI/FS) and Amendment to the Agreed Order (DE 9781) as relates to the Western Port Angeles Harbor Cleanup. We feel that the comprehensive study and the preferred cleanup remedy identified, a combination of excavation, capping and enhanced monitored natural recovery (EMNR) are fact/science-based after analysis of the historic contamination, feasibility of alternatives and possible future uses of WPAH.

We feel that the draft RI/FS that the WPAH Group, five public and private entities, in cooperation with Ecology, has found a cost-effective remedy for the three sediment management areas and that with implementation of the various remedies will meet the standards for cleanup in the Model Toxics Control Act, RCW Chapter 70.105D.

In summary, we agree with the preferred cleanup remedy supported by the thorough study initiated by Ecology in 2008, as well as compliance monitoring to ensure success over the long-term. We feel that it is time to move forward with the cleanup to assist mother nature and make Western Port Angeles Harbor safe for human health, wildlife and the environment. We feel that the time to act is now, with minimal disruption to Port operation and traffic flow, after full input of the public through the comment period, and that Ecology should finalize this plan.

Sincerely,

Marc Mendenhall
Chief of Operations
Cascade Hardwood Group

333 Eclipse Industrial Parkway, Port Angeles, WA 98363
Office: (360) 452-6041 Fax: (360) 417-6805 www.cascadehardwood.com

Port Angeles Business Association

The Port Angeles Business Association is happy to provide the following comments on the Port Angeles Western Harbor Cleanup Remedial Investigation/Feasibility Study:

1. The preferred alternative looks to have struck a reasonable balance between cleanup outcomes and input costs. To our knowledge, it will involve proven cleanup methods in use around the world. We support the preferred alternative.

2. Get it done! Port Angeles does not need a repeat of the failing effort to remediate the former Rayonier Mill site in the eastern Port Angeles harbor and upland area. That effort is still seemingly stuck – an unacceptable cleanup plan, coming decades after the mill closure, with no end yet in clear view.

3. We note that the contaminated sediments are the result of decades of legal industrial and manufacturing activities. The harmful effects of industrial and manufacturing byproducts were either unknown or not very well appreciated while those activities were ongoing. From a public policy perspective, it is more than appropriate that State and Federal budgets should contribute in a substantial way to the sediment cleanup. It will not help economically for the local public and private fisc to bear the entire cost of the cleanup effort.

4. The Potentially Liable Parties (PLPs) will have to bear considerable cost, even if insured against this kind of risk – either in increased insurance premiums, or in an inability to be insured against this type of risk in the future. As above, we need help from State and Federal budgets to help lessen local fiscal impacts and opportunity costs for the money spent from local coffers.

5. It is very appropriate for local governments and business entities to expect the same kind of outside financial support, in the same proportion to the overall effort, as other similarly situated communities have. This is not the first such effort undertaken in our state, and it is reasonable for us to think that earlier cleanup efforts in Western Washington have had substantial Federal and State financial support. If the Department of Ecology were to directly contract for some appropriate portion of the cleanup effort – since the contamination resulted from legal activities back in the day – there would be no constitutional issue of such monies going directly to private entity PLPs involved in this cleanup effort.

Port Townsend AirWatchers

It is welcome to finally have cleanup action in sight. However, in agreement with comments submitted by Dr. Peter deFur and others, the proposal offers cleanup alternatives come from standard operating practices of the past and have been shown to be less effective than methods that have been developed and developing over these most recent two decades and are ripe for use here.

In the last couple of decades much research and many trials have allowed for better methods that actually remediate the contaminated areas. Much work has been done, e.g., with fungi (even underwater varieties), and other bio-forms that don't merely accumulate but actually convert the contaminants. I highly encourage the agency to review literature and consult with those who have been developing these methods, including your area's own Batelle Institute and Dr. Paul Stamets at the region's Fungi Perfecti, for instance.

This site would be an ideal proving ground for methods that these and other researchers have been developing and testing, and I submit that whatever of those methods tried, it would likely be much cheaper and more effective.

Of the proposals that are offered:
• Excavation and removal merely moves the problem from one place to another, replicating the contamination in another ecosystem. As they say, in the environment there is no "away" in which to throw things.

• Cover and contain: the contamination is still there. An impermeable cap means that that layer has effectively been killed. It ignores that mobility between soil strata is part of natural soil health.

• Cover and "jump start the natural recovery process" with sand or gravel layers. This one is baffling. Given the litany of chemicals that have accumulated in the Western Port Angeles Harbor sediments, this is a centuries-long process, so "jump start" is a conceptual stretch.

• Check on natural deposition: by itself, equals "do nothing" which is unacceptable as it merely leaves the contaminated mess. Checking on the process regularly should be part of any cleanup process.

A method or methods that actually convert the toxins in situ without killing or removing the natural living living harbor, have ripened for present use and would be much more cost effective and beneficial to the health of the site as a whole. I submit a request that those methods be used instead.

Thank you for your consideration,
Gretchen Brewer

Groven, Connie (ECY)

From: OEC <oec@olympus.net>
Sent: Friday, March 13, 2020 11:00 AM
To: Groven, Connie (ECY); Lawson, Rebecca (ECY); Pendowski, Jim (ECY); Doenges, Rich (ECY)
Subject: OEC correction on western Port Angeles Harbor comments
Attachments: Comments revised final.docx

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The date of OEC's comments on the earlier copy read 2002. It should have read 2020. Please make note of this.

I've corrected that on this Word document.

Thank you,

Darlene Schanfald
Olympic Environmental Council
Project Coordinator,
Rayonier Mill-Port Angeles Harbor Hazardous Waste Cleanup Project
PO Box 2664
Sequim WA 98382
1-360-681-7565

Groven, Connie (ECY)

From: OEC <oec@olympus.net>
Sent: Tuesday, March 10, 2020 11:45 AM
To: Groven, Connie (ECY); Lawson, Rebecca (ECY); Pendowski, Jim (ECY); Doenges, Rich (ECY)
Subject: OECC comments on western Harbor Draft RI/FS -- Facility ID 18898-Site Cleanup ID 11907
Attachments: Comments revised final.pdf

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PLEASE CONFIRM RECEIPT OF THIS EMAIL

Olympic Environmental Council
PO Box 2664
Sequim WA 98382

Connie Groven
Rebecca Lawson
Jim Pendowski
Rich Doenges
Washington State Department of Ecology
Olympia WA 98504

Attached please find OECC's comments for the western Harbor Draft RI/FS -- Facility ID 18898-Site Cleanup ID 11907.

Darlene Schanfald
Olympic Environmental Council
Project Coordinator,
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Comments on the Western Harbor Remedial Investigation/Feasibility Study
Prepared for the Olympic Environmental Council Coalition
March 9, 2002
ESC LLC
PL deFur, Ph.D.
Henrico VA

Glossary

aBHC-alpha-Hexachlorocyclobenzene
Dioxins- also TCDDs or tetrachlorodibenzodioxins
IHS- Indicator Hazardous Substances
LEKT- Lower Elwha Klallam Tribe
PAH- polynuclear aromatic hydrocarbons
PCBs-polychlorinated biphenyls
RI/FS-Remedial Investigation / Feasibility Study
RPD- redox potential discontinuity
SCU- Sediment cleanup unit
SMU- Sediment management unit
TEQ- Toxic equivalent

Summary of Comments

Several problems arise with the Remedial Investigation and Feasibility Study (RI/FS) that include the interpretation of data for sediment toxicity and assumptions regarding remedies. These problems are discussed in more detail below in the appropriate sections.

The document portrays a general assumption that on-going sources from the on-land, human made features on the harbor shore cannot and will not be controlled. These sources present contamination problems that are not being addressed at present, according to the RI report on nature and extent of contamination. This approach is unacceptable, especially because these sources are at the harbor and not regional or global in nature.

Executive Summary

The Executive Summary states that the “in-water” dredging will cause release of sediment bound chemicals, but modern techniques and equipment will reduce such releases to a minimal amount, far less than even 10 years ago. Such new techniques include sediment/silt curtains, environmental bucket dredges, suction dredges, and GPS guided dredge heads.

The metals will not breakdown ever; natural recovery is useless for metals**,**
PCBs and especially dioxins that breakdown so slowly and under such conditions as to be not treatable, rendering natural recovery also useless for these compounds.

The RI used all the previous investigations that could be obtained and were conducted during recent investigations of harbor contamination, notably the Rayonier, K Ply, Nippon, among others.

The first 5 sections of the RI/FS report are basic materials that collect summaries of what work has been done previously, a description of the harbor, the well-known information to begin the investigation. The RI/FS itself is intended to provide an analysis of the nature and extent of contamination and the sources. The document then goes on to examine the options for cleaning up the contamination.

Section 1 is an introductory and background description of the harbor area
Section 2 Description of the harbor
Section 3 Historical and Current Uses of the Harbor
Section 4 Previous Investigations
Section 5 RI/FS Activities conducted for this report

Section 6 This part evaluates the results of the investigations to estimate the risks and potential harm to humans and ecological receptors in the harbor, not just the Western Harbor for humans and ecological resources.

Section 6.1.1.1 summarizes the human health risks from eating seafood, evaluating health risks to subsistence fishers, Lower Elwha Klallam Tribe members and recreational users. The section notes: "*Therefore, the preliminary human health IHSs identified included: arsenic, cadmium, copper, selenium, mercury, zinc, alpha-BHC, cPAHs, PCBs, and dioxins/furans TEQ."*

Section 7 presents the nature and extent of the distribution of hazardous substances and wood debris in the Western Harbor.

The introductory points on page 7-0, key findings, suggest that the benthic toxicity is small and of no real concern, while the previous section makes a different conclusion, based on chemical concentrations and wood debris distribution and abundance. Wood debris harms benthic marine habitats and organisms.

Data are primarily from 2008 and 2013, 12 and 7 years ago, respectively. No current data from the past two years is used in this analysis.

Page 7- 7 makes a telling comment that the earlier result of bioassay toxicity tests, using harbor sediments, indicate more widespread toxicity in a much greater number of samples. The reduction in toxicity would indicate improvement in sediment quality, as noted:

- "These improved results primarily reflect use of the resuspension protocol (Kendall et al. 2012) that addressed possible larval entrainment/negative bias, but also may reflect improved sediment quality over the 5-year period between 2008 and 2013."

Section 7.2.4, page 7-7. This section seeks to use the survey information to make the case that benthic habitat is not impacted by chemical contamination or wood debris. The

logic here is faulty and the information and data do not fully support the explanation given as the prime explanation and certainly not as the sole explanation. The successional stage of the benthic assemblage may equally as likely be limited and is not higher due to a depressive impact from chemicals and wood combined.

The document fails to account for the impact of the combined toxicity of both wood debris and the contaminating chemicals, as well as naturally occurring chemicals that exhibit innate toxicity. These two types of contamination act in concert on the benthic assemblage.

Table 7.7 This table gives biological successional stage (the progression from simple to more complex and abundant biological communities), and aRPD (redox potential discontinuity) do not give confidence that natural recovery is working effectively and quickly. The depths for the aRPD are not close to the standard 10cm considered the standard depth for oxidized habitat that supports a healthy benthic community. The 15 years, from 1998 to 2013, shown in the table that elapsed between the two surveys should have been enough time to see greater recovery. And those data are now an additional 7 years out of date/not current. Given the extent and nature of the wood debris, large sizes of the wood debris, there is no evidence that recovery is proceeding at a sufficient pace.

Section 8 presents information on hazard indices and cleanup options

The introduction to the section explains a feature that is an inherent flaw in the analytical system because the toxic chemicals are assessed individually. The toxicity occurs collectively for all the exposures that occur simultaneously, including multiple metals, organic chemicals, and gases (ammonia, sulfurous gases). Failure to evaluate cumulative effects is a major flaw.

Section 8.1.1.1
On page 8.2, the inherent flaw in the analytical system is apparent in how chemicals are dropped from further consideration by assessing individual chemicals according to a single benchmark number. In this case, if a chemical is present at a concentration fractionally less than the screening number (i.e. at 75% of the screening number), and is not carried forward for analysis, and other chemicals have a similar pattern, then all such chemicals are dropped, although the combined, cumulative effects and exposures may well cause harm, or least increase risk. This problem is most serious when the chemical act on a common biological endpoint, such as the nervous system, a sensitive tissue for most, if not all metals. An excellent example is mercury, lead and cadmium, all of which target the developing central nervous system. This inherent flaw is present in the analysis of these data and unfortunately is imbedded in agency procedures and regulation.

Section 8.3.1
Page 8-9 The text admits that land-based sources are not considered in the control or remedial efforts, unlike the situation in CERCLA sites, such as the Lower Duwamish River. In Port Angeles, the remedy does not consider what can and should be implemented to address ongoing sources of contamination. The text does

Section 8.3.2 on page 8-9 and 8-10. This text uses a MTCA provision as an excuse to not clean up on the basis of temporarily displacing natural resources in the harbor. The argument is that cleaning up the contamination will harm the system more than leaving the contaminants in place forever. The metals and PCBs and dioxins/furans will remain in the harbor forever if not removed or treated in place and this section seeks to make the excuse that cleaning up the harbor will cause more harm than good. The flaw in this logic is that the long term harm from leaving contaminating chemicals in place is not toxic forever. These assumptions are false and should be rejected. An analysis will show that the loss of resource use over the next 100 years alone is greater than any short term financial gain to the company.

Section 9.0 Page 9-0 lists bulleted items that are information items from the Remedial Investigation. The last item on the list, the *" determination that wood debris, although widespread, does not pose a toxicity concern within the SCU (sediment cleanup unit)"* is not fully supported by the evidence and, indeed, evidence in the Remedial Investigation contradicts this statement for the following reasons:

1) The sediment toxicity tests do indicate toxicity for this limited battery of tests;
2) The redox potential and thus indication of lack of oxygen, a lethal and biologically limiting condition, is not in the full normal range and the aRPD is not at the depth point to indicate support of a balanced and population of infaunal benthic species;
3) The benthic community successional stage analysis does not indicate that all of the areas with wood debris have the normal and appropriate assemblage of benthic species, especially considering that Puget Sound as a source of larvae and immigration is immediately available, and decades have passed since the input of wood debris has ceased from Rayonier and others, providing time for recovery. Recovery is not occurring at a sufficiently fast pace to conclude "no toxicity." Wood debris is known to produce toxic chemicals (both acute and chronic effects, such as sterol exposure) and these effects must be considered in evaluating wood debris as source materials.

Section 9.2
page 9-6. The last conclusion of this section describes a benthic community that is little impacted by wood debris and the text makes little to no comment about the effects of the combined exposures of wood debris and toxic chemicals. Nor does the section admit or recognize the alternative explanation of the data that the wood debris continues to impair the benthic community and limit growth and recruitment. The alternative interpretation must be given equal credence and credibility, based on the existing evidence.

Section 10. Feasibility Study
This section presents a range of options for addressing the problems of contamination in the area described in the previous sections. One of the options must be the one of doing nothing or also called the "No Action Alternative." This option must describe how risks and conditions can be expected to progress over the coming years if no active cleanup is undertaken. Few methods have been used to address toxic chemicals in sediments: remove, cover up, add something to bind the chemicals or leave it to the system to cover with sediment or wash away. An abundance of evidence from other sites over many years (note the James River, Hudson River, Housatonic River, Columbia River)

demonstrate that PCBs and similar chlorinated organic chemicals will not breakdown, or otherwise leave the system.

The FS also presents the objectives of the cleanup in terms of achieving specific objectives, such as protecting human health from exposure due to consuming contaminated seafood from the harbor. These objectives are presented on Page 10-1.

Section 11 presents information on where the sediment cleanup will take place, the cleanup levels and specifics about sediment remediation. The harbor is divided into three cleanup areas: SMA -1; SMA-2 and SMA -3.

Section 11.2.1 page 11-6 Here the document explains that some areas present logistical restrictions on what work can be conducted in the harbor in terms of cleanup. The major issue is the presence of over-water structures such as docks that cannot be moved and many remain in active use.

The remedy will address sediment cleanup on an area-wide basis so that the areas that cannot be cleaned up are “averaged” with areas that will be cleaned up. This method is standard in approaching this type of sediment cleanup.

Section 12 Remedial Technologies Screening
This section discusses various methods that might be or could be used to cleanup the different parts and contaminated areas.

For the most part, such a presentation is straightforward, but may have a one-sided presentation or a “bias” in terms of limiting applicability of one method or technology.

Page 12-4 for example discusses the limitations of environmental bucket dredges or the sort that have been used in the Lower Duwamish River and in Newark Bay. In the former case, contaminated sediments from an Early Action were removed by an environmental bucket dredge designed and operated for just such a purpose as contaminated sediment removal. And in Newark Bay NJ, the similar situation existed, except that the depth was much greater, up to 50 feet, with an overdredge. The discussion on page 12-4 discounts the option for environmental bucket dredges. This text despite the fact that in at least Newark Bay, if not several other cases, the use of modern technologies and approaches was able to reduce dredge residuals to a mere fraction of other operations and historical residuals.

Section 12.2.4 presents the information on nearshore confined disposal facilities in which the dredged material is placed in a barriered /diked structure that is engineered for such containment. The cleanup at Commencement Bay has such a unit and the community needs to discuss the option of this type of facility in the harbor. At present, the RI/FS does not contemplate such a confined facility, but leaves open the option, should conditions arise.

Section 12.3 explains the general aspects and general methods for an engineered cap to cover sediments that cannot be removed, or are lightly contaminated, or for some other reason must be isolated from the environment.

Section 12.4 This part has some information on treating contaminated sediment in place, referred to as *in situ* treatment. Such treatment is not considered appropriate for metals that do not breakdown, and for some chlorinated organic chemical that have a breakdown so slow as to be imperceptible. A few new technologies are under development or have been used in limited cases for *in situ* treatment, mostly in upland soils. This treatment also includes additives that can bind the chemicals and prevent them from moving into the food web; organic carbon is one such additive and is considered briefly in the feasibility report. Once the chemicals are bound, no additional changes occur.

Section 12.5, page 12-12 and13 presents some material and assessment of Enhanced Monitored Natural Recovery (EMNR), which is a combination of adding a layer or material and then monitoring the situation. This approach, specifically or generally, can work with organic chemicals that breakdown through the action of microbial activity (either natural microbes or added ones). As in the text above for section 12.4, this method does not work with chemicals that do not break down, such as metals and dioxins and some other chlorinated organic chemicals.

Section 12.6, page 12-15. This piece on Monitored Natural Recovery does explain that several different processes are involved in and considered MNR: physical cover, chemical breakdown, and biological digestion. The most toxic chemical contamination problems in Port Angeles Harbor will not be addressed by MNR at all, especially because the natural sedimentation rate is low in the harbor, as explained in this section. MNR for metals and chlorinated organic chemicals that do not breakdown is ineffective.

Section 12.7 Source Control.
The text of the document observes that upland sources should be addressed:
“As stated in the AO, “this Order requires investigation of sediments and identification of ongoing upland sources of contamination that have the potential to result in sediment recontamination at levels greater than prospective sediment cleanup standards. Any such upland sources identified under this Order will be addressed under separate actions, agreements, permits or orders” (State of Washington 2013a).” The problem with the nice sounding language is that the wording does not require that all of the upland sources will be eliminated with certainty.

Section 13 Development of Remedial Alternatives

This section explains and discusses the combination of methods that might be used to clean up the contamination in the three major areas, management areas 1, 2 & 3. The options include maximum removal, medium removal and minimum removal for the three major sediment management areas (SMAs).

One of the alternatives for each area includes no removal of sediment and instead reliance on natural recovery of some description.

One notable aspect of this section is that the FS includes and proposes no action for the largest area, SMA 3. The explanation for no active remediation for the majority of the harbor is that active remediation is too difficult and too expensive.

Section 14 Alternatives
All of the alternatives were evaluated according to a series of criteria:

1- Protectiveness
2- Permanence
3- Long term effectiveness
4- Short term risk
5- Technical and administrative issues
6- Consideration of community public concerns

The final selections for cleanup are presented in this section, specifically, the RI/FS identifies the following alternatives as the preferred ones for the three sediment management areas:

Alternative 1-D: Partial Intertidal Excavation and Capping with Subtidal Capping for SMA 1;
Alternative 2-E: Intertidal Capping with Subtidal EMNR for SMA 2;
Alternative 3-B: Year 10 EMNR with MNR for SMA 3.

These options do not present the most effective long term options. The better options maximize removal of the contaminants from the intertidal zone in SMA 1 intertidal areas, with subtidal removal.
In SMA 2, the better option is intertidal removal with some subtidal removal and EMNR.
And in SMA 3, the option should include removal and EMNR, with limited MNR.

Summary
In summary, the FS assumes that the benefit of a cleaner harbor, which accrues to the entire community is not great enough to balance against the cost to the companies responsible for the cleanup. As a result, the FS proposes to leave more contamination in place than alternatives that can remove more contamination. The alternatives with maximum removal will provide much better long term, permanent protection and will be more cost effective for the Port Angeles community.

• Cumulative effects of all contaminants simultaneously need to be considered
• The on-going and land based sources, both soil-based and water-based, must be controlled by requirement and with certainty
• The most recent data are 5 years old and must be updated before a decision is finalized
• The most up to date methods are not included (removal methods used in the US) and the FS is incomplete without these methods
• The impacts of woody debris are far greater than noted in the RI/FS.

Groven, Connie (ECY)

From: Matt Beirne <matt.beirne@Elwha.org>
Sent: Monday, March 16, 2020 4:53 PM
To: Groven, Connie (ECY)
Subject: LEKT Comments on WPAH Public Review Draft RIFS_F
Attachments: LEKT Comments on WPAH Public Review Draft RIFS_F.docx

THIS EMAIL ORIGINATED FROM OUTSIDE THE WASHINGTON STATE EMAIL SYSTEM - Take caution not to open attachments or links unless you know the sender AND were expecting the attachment or the link

Hi Connie,

Please find our attached comments regarding the WPAH Public Review Draft RIFS. If you have any questions, feel free to give me a call.

Thanks!

Matt

Matt Beirne
Natural Resources Director
Lower Elwha Klallam Tribe
760 Stratton Road
Port Angeles, WA 98363
360-457-4012, ext 7480
360-461-2516 cell

Lower Elwha Klallam Tribe's Additional Comments
on the Western Port Angeles Harbor Sediment Cleanup Unit
2019 Public Review Draft Remedial Investigation/Feasibility Study

March 16, 2020

The Lower Elwha Klallam Tribe ("Lower Elwha" or "the Tribe") has previously, in 2018 and 2019, submitted review comments to the Department of Ecology on prior review drafts of the Western Port Angeles Harbor Sediment Cleanup Unit Remedial Investigation/Feasibility Study (RI/FS). While the Tribe found most responses to our comments to be adequate and believes that the Western Port Angeles Harbor Group's (WPAHG) revisions the RI/FS report reasonably address some of the Tribe's comments, we continue to note several concerns that Ecology must consider in developing the Cleanup Action Plan for the Site.

Additional Characterization

The Tribe supports additional characterization during the pre-remedial design phase to include characterization of intertidal areas within the lagoon (SMA-2) and within proposed buffer areas surrounding and beneath overwater structures and in other nearshore areas (SMA-1 and SMA-3). The potential for disturbance in these areas to re-suspend sediments and re-contaminate adjacent remediated areas should be evaluated and addressed. Potential contamination in these areas must be considered and addressed when determining compliance with cleanup levels based on surface-weighted averaging.

According to the Draft RI/FS there are a number of historical industrial outfalls located in the inner harbor and the lagoon. It appears that these shoreline locations were not sampled during the remedial investigation. We recommend collecting sediment grab and core samples from these intertidal areas during the pre-remedial sampling design.

In addition to the historic industrial outfall locations, there appears to be a sampling gap along the northwestern shoreline from the Tesoro leased pier to the east. This area appears to have greater composition of fines and is located near significant historical industrial activities.

Sediment Management Area (SMA) 2

As noted in our previous comments, the Tribe believes that a full dredging or partial dredging and capping option is necessary rather than capping only or EMNR options. While a revised alternative (Alternative 2-D) provides a new option that focuses on intertidal and shallow subtidal excavation and capping actions in the lagoon to minimize changes to ecological conditions in this area, it is not included in the preferred alternative. The Tribe continues to strongly prefer excavation or partial excavation and capping in the lagoon, as opposed to capping and EMNR only.

Transloading Facility

The Tribe anticipates that extended activities at the proposed transloading facility may have significant impacts on Tribal uses and resources at the adjacent Tse-Whit-Zen village site. WPAHG should be on notice to consult with the Lower Elwha Tribe and develop culturally appropriate mitigation for these potential impacts. In addition to options for shielding to minimize noise and dust impacts, compensatory mitigation may also include additional ecological restoration actions at the lagoon.

Filling of Intertidal Habitat

The selected alternative should not rely on filling of intertidal areas that would result in the loss of the amount or quality of intertidal habitat.

Compliance with MTCA and SMS Requirements

Alternatives that do not comply with the requirements of the Model Toxics Control Act (MTCA) or the Sediment Management Standards (SMS) should not be included in the RI/FS. Retaining such alternatives is misleading and gives the appearance that the alternative preferred by the proponent provides greater protection than an alternative that doesn't even meet MTCA and SMS standards.

Treaty Rights and Access

The RI/FS notes that institutional controls would be detailed as appropriate in an OMMP to be developed and refined during remedial design "ensuring that such controls minimize the potential to impact the exercise of Tribal treaty rights." This sentence should be modified to add the phrase "including tribal access to treaty resources." In addition, it should be expressly noted that institutional controls that have the potential to impact the exercise of Tribal treaty rights should be developed in consultation with Lower Elwha and the S'Klallam Tribes.

Clallam County Board of Commissioners

See attached letter for comments from the Clallam County Board of Commissioners.

Loni Gores - Clerk
agores@co.clallam.wa.us
360-417-2256

Board of Clallam County Commissioners

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MARK OZIAS, District 1, Chair
RANDY JOHNSON, District 2
BILL PEACH, District 3

Rich Sill, County Administrator

March 3, 2020

Department of Ecology
Connie Groven
Cleanup Project Manager
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Re: Port Angeles Harbor Cleanup Site Cleanup ID 11907

Dear Ms. Groven:

We appreciate the scientific work and information your department has developed for cleanup alternatives in the Western Port Angeles Harbor after over a decade of study.

After the Department of Ecology thoroughly investigated the alternatives in collaboration with the five public and private entities, we believe the science based protective remedy recommended is cost effective, can be implemented on a timely basis, and meets the Model Toxics Control Act. We recognize that this information and recommendation was the result of hard work over many years. One of the very important factors in your preferred remedy is the fact that there are case studies showing that your recommendation has been successful in other locations.

The preferred cleanup remedy includes intertidal excavation, intertidal capping, and subtidal enhanced monitoring. This combination of remedies when coupled with compliance monitoring and institutional controls (we believe) will result in a successful outcome. This remedy is comprehensive, and includes protections for ecological and cultural resources during construction to protect salmon and shellfish habitat. In addition, you have recognized that this project will be taking place in a working harbor, and your recognition of this fact will help to sustain water based operations during the cleanup period.

Thank you for accepting our comments, and we appreciate the Department of Ecology's proactive stance on this very important project.

Sincerely,

BOARD OF CLALLAM COUNTY COMMISSIONERS

Excused absence
Mark Ozias, Chair

Randy Johnson

Bill Peach