

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF WATER
WASTEWATER DISCHARGE AUTHORIZATION PROGRAM

SARAH PALIN, GOVERNOR

555 Cordova
Anchorage, Alaska 99501-2617
PHONE: (907) 269-6283
FAX: (907) 334-2415

September 5, 2008

Certified Mail 7007-0710-0004-3852-8529

Mr. Dick Somerville, P.E.
PND Engineers, Inc.
9360 Glacier Highway, Suite 100
Juneau, AK 99801

Subject: Douglas Boat Harbor Sampling and Analysis Plan,
dated August 4, 2008

Dear Mr. Somerville:

PND Engineers is working for the City and Borough of Juneau (CBJ) on the Douglas Harbor Renovation. On March 4, 2008, agency staff from the Alaska Department of Environmental Conservation (ADEC), U.S. Army Corps of Engineers (Corps), PND, and CBJ met to discuss the high mercury levels recorded in the sediments of Douglas Boat Harbor in an area proposed for dredging. There was discussion about the unsuitability of the dredge materials for unconfined open-water disposal in the middle of Gastineau Channel. Several alternatives were discussed. After the meeting no follow-up discussions were held between ADEC and PND or CBJ.

On August 4, 2008 an email from you presented a draft Sampling and Analysis Plan (SAP) entitled Evaluation of Sediment from Douglas Harbor in Juneau, Alaska, prepared by NewFields, Port Gamble, Washington for evaluating the Douglas Harbor sediments using bioassay and bioaccumulation tests. It is our understanding that PND and CBJ believe that if the sediments in question have bioassay and bioaccumulation results below certain values then the sediments would be considered approved for unconfined open-water disposal. On August 20, 2008, ADEC met with staff from PND, Corps, CBJ, and New Fields (the laboratory conducting the sampling and testing detailed in the SAP). During that meeting ADEC staff provided initial review comments on the SAP, more complete comments are provided in attachment one.

As mentioned in the meeting of August 20, 2008, ADEC does not have regulations or guidance documents specific to dredge material sampling and disposal. Alaska's water quality standard for toxic or other deleterious organic and inorganic

substances for marine water uses specific to the growth and propagation of fish, shellfish, other aquatic life, and wildlife (18 AAC 70.020(b)(23)(C) reads as follows:

“The concentration of substances in water may not exceed the criteria shown in Table IV and in Table V, column B of the *Alaska Water Quality Criteria Manual* (see note 5), or any chronic and acute criteria established in this chapter, for a toxic pollutant of concern, to protect sensitive and biologically important life stages of resident species of this state. There may be no concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, adverse effects on aquatic life or produce undesirable or nuisance aquatic life, except as authorized by this chapter. Substances may not be present in concentrations that individually or in combination impart undesirable odor or taste to fish or other aquatic organisms, as determined by either bioassay or organoleptic tests.”

When ADEC does not have guidance of its own we look to other states that have developed such guidance. ADEC currently uses guidance from Puget Sound, in Washington State, as having well-developed documents and criteria for marine sediments and as being close regional testing ground for marine dredge issues. The main document recently developed is the guidance document: Dredged Material Evaluation and Disposal Procedures (Users' Manual), Dredged Material Management Program (DMMP), Corps of Engineers, Seattle District; Environmental Protection Agency, Region 10; Washington State Department of Natural Resources; and Washington State Department of Ecology. DMMP, USACE, Seattle: July 2008.

Figure 2-4 of the DMMP User's Manual provides a Tiered Testing Decision Diagram. PND has conducted Tier 2 Chemical Testing. The SAP PND provided August 4, 2008 addresses Tier 3 testing. Table 6-1 of DMMP gives mercury levels for the screening level (SL) as 0.41 mg/kg, for the bioaccumulation trigger (BT) as 1.5 mg/kg, and as the maximum level (ML) as 2.3 mg/kg. The screening level (SL) is a level at or below which there is no reason to believe that dredged material disposal would result in unacceptable adverse effects. The bioaccumulation trigger (BT) is the value at which there is a reason to believe that the chemical would accumulate in the tissues of the target organisms and a trigger value above which bioaccumulation testing is required before suitability for open-water disposal can be determined. The maximum level (ML) represents the apparent effects threshold (AET) – a chemical concentration at which biological indicators show significant effects.

Values for the Douglas Boat Harbor, sampled in 2007, for 25 individual samples (Averaged value for sample PND07-11 is excluded.) demonstrate mercury values all above the screening level (SL)(see attachment two). Thirteen values range above the maximum level (ML), from 2.5 to 5.4. Nine more values range between the biological trigger (BT) and ML, from 1.7 to 2.2. Only three values are between SL and BT,

from 0.47 to 1.1. DMMP guidance, section 6.8 states, "At levels above the ML, standard biological testing may still be pursued but there is a high probability that the dredge material will fail Tier 3 testing. The DMMP agencies have increasingly come to regard the ML values as a more valuable screen for project proponents rather than as a useful regulatory tool for testing. While some sediments with more than one ML exceedance have passed biological testing, the majority have failed. By comparing sediment chemical data to the MLs, a dredging proponent can better judge how to proceed with the project, i.e., whether to invest more into testing for unconfined, open-water disposal, or to rechannel that effort into other disposal options and testing for those options (e.g., leachate tests)."

If Tier 3 testing is pursued by the applicant, then DMMP guidance (as described in Figure 2-4 and Section 9.0) compare Tier 2 sediment values against a ML Rule. The ML Rule states, "If two or more chemicals of concern during a Tier 2 evaluation exceed the maximum level (ML) guidelines, or if any one chemical exceeds the ML by more than 100 percent, the material will be considered unsuitable for unconfined open-water disposal unless a Tier 4 assessment is conducted." Thirteen of twenty-five samples taken at the Douglas Boat Harbor in 2007 indicate that adverse effects will be exhibited and three values indicate the need for Tier 4 testing if unconfined open-water disposal is pursued.

According to the DMMP User's Manual both Tier 3 and Tier 4 testing would need to be performed. It is our understanding the SAP submitted August 4, 2008 is for Tier 3 testing only. The criteria ADEC will use to evaluate the Tier 3 testing are presented in Table 7-4 and Table 8-4. Even if these criteria are passed, ADEC will want to see Tier 4 long-term bioaccumulation testing and modeling through the food chain for human health risk assessment. A Tier 4 SAP would require additional consultation with ADEC to make sure that requirements will be met.

ADEC concerns with proceeding with Tier 3 and Tier 4 Tests are:

1. Mercury levels are high and that there are no immediate assurances that testing will pass the criteria laid out in the DMMP User's Manual.
2. Tier 3 and Tier 4 studies require a clean reference site, devoid of mercury or major contaminants but with similar parent materials as to the test site, Douglas Boat Harbor. Much of Gastineau Channel may be influenced by historical mining activity and presumed substantial sediment transport. The area's sediments have not been characterized in the past. As such, the applicant is cautioned, as an inadequate reference site will weaken or void test results.

ADEC encourages the applicant to discuss Tier 4 testing with the applicant's agents and to outline Tier 4 testing or other alternatives. Upon doing so, ADEC will make its Douglas Boat Harbor team available for further project discussion. Thank you.

Sincerely,



Sharmon M. Stambaugh
Environmental Program Manager

Attachments One and Two

cc: Brenda Krauss, ADEC
Jim Gendron, ADEC
Sally Wanstall, ADEC
Daniel Fremgen, ADEC
Steve Bainbridge, ADEC
John Stone, CBJ

William Ashton, ADEC
Richard Heffern, ADEC
Bruce Wanstall, ADEC
Tamara Carona-Marek, ADEC
Chris Meade, EPA
Richard Jackson, Corps

Attachment One

The following are ADEC's specific comments and questions on the sampling and analysis plan entitled Evaluation of Sediment from Douglas Harbor in Juneau, Alaska, prepared by NewFields dated August 4, 2008.

1. The SAP refers to Lower Columbia River Criteria/Manual and Puget Sound Criteria. Refer to Puget Sound Criteria throughout and revise SAP.
2. Ocean Disposal Testing Manual is referenced, but Gastineau Channel is not part of this zone. Revise using following guidance document: Dredged Material Evaluation and Disposal Procedures (Users' Manual), Dredged Material Management Program (DMMP), Corps of Engineers, Seattle District; Environmental Protection Agency, Region 10; Washington State Department of Natural Resources; and Washington State Department of Ecology. DMMP, USACE, Seattle: July 2008.
http://www.dnr.wa.gov/BusinessPermits/Topics/AquaticResources/Pages/aqr_dredged_material_program.aspx
In the SAP, address guidance in DMMP's User's Manual for:
 - Reference Sediment,
 - Updated Bioaccumulation Protocol,
 - Bioassay Results Interpretation,
 - and all other relevant sections.
3. Give full citations for all referenced documents historical data. Include Civil Works Sampling of Harbor in 1995.
4. Include references and/or tables for threshold values used in studies.
5. Provide maps with useable scale, throughout document. Proposed station locations have no meaning without useable maps.
6. Describe methodology for the composite samples and subsamples. Include discussion of "equal volumes." At what depth will the material be sampled within the core? Diver's core may not be adequate.
7. What is methodology for determining a reference site? Initial testing may be warranted to determine the reference site's appropriateness.
8. Four composite samples are tabled in SAP but five are proposed. Which is it?
9. Discuss percent completion. What constitutes acceptance of results? What corrective measures may be necessary? Should five or six samples be run to assure adequate percent completion?

10. Micro-analyses (p14) require specific methodology. How will you ensure that contamination will not take place? What percent completion on this test can you expect? Describe blanks and duplication.
11. Ammonia testing in salt water is not ICP-MS (p21 SAP). State correct methodology.
12. Include a signature page, after revisions are made, for at the very least the ADEC Project Manager and Quality Assurance Officer and the applicant's Project Manager and Quality Assurance Officer. Other agency representatives may be included.
13. To evaluate the potential of mercury methylation physical and chemical parameters should be considered, including acid volatile sulfide (AVS), total organic carbon, salinity, etc. I didn't see any reference to these parameters in the plan.
14. The bioassays do not consider the effects of resuspension of contaminated sediments. Resuspension may potentially make available mercury that was previously buried and unavailable to methylating organisms.
15. The seawater for bioassay testing is from Port Gamble, Washington, therefore not imitating the exact conditions of the site. How will the difference between the sample site and the Port Gamble water be accounted for?
16. Page 5 – In the introduction it mentions that the sampling and testing program is to verify the “concentrations of mercury present in the sediment, identify the source of the mercury, and to conduct biological testing to aquatic organisms.” The section “identify the source of the mercury” should be removed as there is nothing in the rest of the document that indicates this is one of the objectives.
17. Page 7 – In section 2.1 it states that 5 composite samples will be taken. This would be one sample for every 6,000 yd³. Two concerns here. On table 2 page 11 only 4 composite samples are identified. Also due to there not being a reference to % completion criteria it would be expected that there is 100% completion. This may be a risky assumption. Therefore suggest 6 composite samples be taken to leave room for say broken sample bottles or a failed analysis and no extra sample for reruns.
18. Table 2 page 11 – Reference Station shows on sample being taken and yet it will be a “Reference composite.” Suggest there be more than one reference sample taken and they are composite samples.
19. Page 12 – In the paragraph describing the diver core as a sampling method it says that the tube is approximately 2 feet long. On the NewFields web site it says that the dive core sampler has a penetration depth of 0.5 – 1.5 feet. The project depth has been stated as 3 – 7 feet. Perhaps this sampling method will not work.
20. Page 13 Section 4.1.5 – This section should be cleaned up. First the sub-sample should be fractioned off, then equal volumes of the sub-samples in an area composited, then the composited sample divided up for the different analyses. The sentence that says, “Area composites will be generated by

combining all station samples from a given area.” should note that a composite is made of equal volumes of each station sample.

21. Page 13 Section 4.1.6 – Included in the shipping narrative should be stated that one temperature blank should be included in each cooler so receiving labs can document that the sample temperature was maintained during transit.
22. Page 20 –It is stated that the method for determining methylmercury in water, sediment, and tissue (EPA Method 1630) is currently being adapted by the EPA which means it has not yet been adapted. Is there an alternative?
23. Page 20 – It says that total mercury in water will be tested. What water will be tested? Are water samples going to be taken at the same time as the sediment samples? Or is the water extracted from the sediments going to be tested? This needs to be addressed and explained.
24. Page 21 Table 5 – The ammonia procedure is not ICP-MS but ion-selective probe. The method for analysis should be proceed by a distillation prep to avoid interference from a salt water matrix.
25. The “reference” area and the “disposal” site are not well defined.
26. The reference sample should be a whole sediment used to assess sediment conditions exclusive of the material(s) of interest, that is as similar as practicable to the grain size and total organic carbon (TOC) of the dredged material. If reference sample is taken at the same time as the field samples what will be the course of action if the reference sample does not meet these criteria?
27. The methods for testing mercury, USEPA 1631 and USEPA 1630, are for low level detection. This will require more attention paid to eliminating any possible contamination. Sampling containers should be provided by the lab conducting the analysis. These containers will be cleaned and certified according to lab protocol. Sampling should be done according to clean hand/ dirty hand procedures using gloves that are talc free. It may be that the lab can also supply the gloves. The lab should be contacted to see if a field blank can be supplied and if extra sample should be collect to supply the lab with volume for a matrix spike and matrix spike duplicate.

Attachment Two

Results from sampling conducted in Douglas Harbor, Douglas, Alaska [Lundberg, Jennifer et al. PND Inc., Juneau, Alaska. Sediment Characterization Report: Old Douglas Harbor Replacement, November 2007.]

Sample ID	ReportableResult mg/kg	Sample ID	ReportableResult mg/kg
PND07-2A	0.47	PND07-12A	4.9
PND07-2B	1.0	PND07-12C	4.7
PND07-2C	1.8	PND07-13A	4.4
PND07-3A	2.8	PND07-13C	2.1
PND07-3C	2.2	PND07-14A	2.1
PND07-4A	3.5	PND07-14C	2.7
PND07-4C	1.1	PND07-15A	5.4
PND07-5A	3.5	PND07-15C	2.5
PND07-5C	3.9	PND07-16A	1.9
PND07-6A	2.7	PND07-16C	3.0
PND07-6C	1.9		
PND07-7A	2.1		
PND07-7C	1.7		
PND07-11	1.3 Ave., Ind. Values?		
New Surface Dredge Comp	2.2		
Harbor Dredge Comp	3.5		
PND-1	1.8		