March 30, 2011

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Mr. William Kavanaugh
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696 Virginia Road
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COMMENTS SUBMITTED VIA E-MAIL

RE: Public Comments to the Army Corps of Engineers Proposed August 2011 Maintenance Dredging [***and In-Water Disposal***] of the Kennebec River Channel, Sagadahoc County, Maine

Dear Mr. Kavanaugh,

Thank you for providing this opportunity to comment on the Kennebec River Maintenance and Advance Maintenance Dredging and Disposal project proposed for August 2011. The US Army Corps of Engineers (USACE) is proposing to dredge sediment from the Kennebec River federal navigation channel at Doubling Point reach. The tops of some of the sediment waves, which are sculpted by the currents in that reach, may interfere with the Spruance's departure from BIW scheduled for September 1st, 2011. As described in the March 16, 2011, CENAE Suitability Determination for this project, USACE is proposing to dredge 50,000 cubic yards (cy) from a 23-acre stretch of the Doubling Point reach and dispose of these dredged materials in the Kennebec Narrows, the "north of Bluff Head disposal site"[1] two miles downstream. In addition, the USACE proposes to dredge 20,000 cy from a 39.2 acre area of the navigation channel at the mouth of the river south of Fort Popham, just off-shore from the Popham Beach B&B, and dispose of this material near Jackknife Ledge, about 1 mile off the low-tide line of Popham Beach State Park.

These comments incorporate by reference the comments of The Phippsburg Shellfish Commission; the Kennebec Estuary Land Trust; the Friends of Merrymeeting Bay; Brenda Cummings, President of the Phippsburg Land Trust; Laura Sewall, Director, Bates-Morse Mountain Conservation Area and Assistant Director, The Harward Center for Community Partnerships Bates College; and the comments of Stephen Hinchman, Esquire. Additionally,

[1] The North of Bluff Head disposal site, will be called the Kennebec Narrows disposal site in this comment. The Kennebec Narrows disposal site is between Morse Cove and Bluff Head in the Kennebec Narrows portion of the Kennebec River. Phippsburg is on the western shore and Arrowsic is on the eastern shore. The eastern shoreland is quite steep, and undeveloped. The western shoreland is residential, with homes set back from the shore because of shoreland protection regulations, as well as the topography of the area.

the comments I submitted to the Maine Department of Environmental Protection on March 21st, 2011 are included as Appendix 1.

Statement of My Interests in This Project and My Experiences with the Disposal of Dredged Materials from the BIW Sinking Basin Project in November 2009.

My home is located on the west side of the Kennebec River Narrows abutting and immediately adjacent to the disposal site.

In November 2009, after noticing the loud, lighted, night-time dumping, from my living room window and then seeing the turbidity in the water and black, slimy muck on the intertidal zone, I made some calls to find out who was doing the dumping. Once it was determined that the dumping was being done by BIW with permits from the Army Corps of Engineers (ACE) and Maine Department of Environmental Protection (MEDEP), I invited the ACE, MEDEP and BIW to my property on November 24, 2009 to see the impact of the disposal and to discuss the applicable regulations. My shoreline is normally rocky and compacted. After the BIW dredging, thick mud had accumulated on my shoreline and was visible upstream and downstream. A request for a sample of the material that was being dredged, was denied and no samples, not even one, had been taken as part of the permit application process.

At the riverside meeting with the agencies, I requested that the disposal be stopped until the proper permit information was provided and the determination made that **this** disposal area was the least environmentally impactful, practicable, disposal location, and that appropriate actions to minimize impact had been taken, as required by the in-water dredge disposal site regulations in 40 CFR 230.

Dredging and disposal stopped before the end of the Thanksgiving weekend and I remain hopeful that entities that wish to use the Kennebec Narrows for disposal of dredged material will do the required permitting prior to further dredging and disposal.

Although I have been an abutting property owner to the Kennebec Narrows disposal area since spring of 2007, I received no notice of either the November 2007 sinking basin dredge material disposal permit (which had only 15-day public notice period by the Army Corp of Engineers), nor the November 2009 sinking basin dredge material disposal permit, which did not have any public notice period from the Army Corps of Engineers and which resulted in a 10+ year permit expiring 12/31/2019.

Based on my review of USACE and MEDEP permits, prior to issuance of the 2002 BIW dredging permits that allow dumping of the sinking basin dredged material in the Kennebec Narrows, the sinking basin dredged material as well as the dredging material from the dredging of the ways and piers required upland disposal or beneficial reuse, for example as landfill cover.

BIW used to give away dredged materials from their ways and piers for use as topsoil, until chemical analysis showed levels of heavy metals and polycyclic aromatics that, at times, were above the health based criteria. Upland disposal continues for these materials, but with controls on allowable beneficial reuses. In 1988 BIW received a permit to remove an underwater ledge by the south dock. The sediment on top of the ledge was dredged and beneficially used upland while the rock ledge debris was permitted for dumping in the Kennebec Narrows.

In 2002, because the BIW sinking basin (which had been predicted by the engineers to be self-scouring) seemed to be becoming significantly shallower, either because of sidewall slumping or sediment deposition, there was a strong push to permit the basin's dredged material to be disposed of in the river. Based on a determination that the dredged material consisted of clean, coarse sand that would not impact areas outside the disposal zone, MEDEP issued a NRPA permit for dredging of the sinking basin and disposal of 10,000 cubic yards per year in the Kennebec Narrows for 10 years.

Unfortunately, the determination that disposal of this clean coarse sand would not affect adjacent areas – including my property, and nearby marshes, flats and rocky shores – has not proven correct. The foot-deep layer of muck that pooled in the intertidal zone after disposal has not "gone away"; it covers significant areas of the intertidal zone, up to 6 inches deep. And the follow-up question is when the material "goes away" has it gone to somewhere that is appropriate. Samples of the muck are being analyzed for chemical constituents and grain size, and that data should be available soon.

These are the type of impacts that the Section 404(b)(1) Guidelines and USACE dredge disposal site regulations require be addressed and resolved (i.e. avoided or mitigated) before any action is taken. Then, only if the in-water disposal site is the least environmentally impactful, practicable alternative, do the regulations and guidelines allow issuance of a permit. It is my hope that in the current process, the USACE will fully address these requirements and avoid a repeat of the impacts caused by dumping in 2009 and, based on my research, which also occurred during prior dredging and disposal events in the Kennebec Narrows.

Maintenance Dredging of Doubling Point with Disposal at North of Bluff Head (Kennebec Narrows) and Maintenance Dredging at Popham Beach with Disposal at Jackknife Ledge set for August 2011.

I appreciate the fact that MEDEP and the USACE provided me, as an interested person and abutter of the Kennebec Narrows disposal area, with notice of the public comment period for this August 2011 proposed dredging and in-water disposal. The following comments review the USACE Public Notice, the USACE Draft Environmental Assessment submitted with the Corps' NRPA permit application to MEDEP, and related documents and studies, in light of the requirements for discharge of dredge and fill materials contained in 40 CFR 230.

Cumulative Impacts.

The proposed action cannot be viewed as a single activity: rather it is just one in a series of dredging and disposal projects that have significant impact on the Kennebec River both individually and collectively. Because the cumulative impact of disposal on an area must be taken into account, all dredge and disposal activities must be documented, including both USACE actions in the navigation channel area, and also BIW disposals. Based on information on page 5 of the draft EA, "Table 1, Kennebec River Federal Navigation Channel Dredging History" and other information in the record, I have created Appendix 2, which attempts to create a comprehensive list of dredging and disposal activities. Correcting and updating this Appendix to reflect the most accurate information will be helpful.

Low Impact Dredging.

Stephen Dickson, Maine State Geologist, has been evaluating the Kennebec River dredging and disposal areas for many years.

On February 24, 2011, the day of the Phippsburg public meeting regarding the proposed August 2011 dredging and disposal in the Lower Kennebec River, he provided the following information on the sediment movement from Bath through Bluff Head, which explains why the Doubling Point channel continues to need dredging to meet the navigational requirements of the ships at BIW and compliance with the 27 foot authorized navigational depth.

> On a daily time frame, the Kennebec River below The Chops (upstream of the City of Bath) has reversing currents driven by the rise and fall of the tides (Fenster et al., 2001). Bi-directional (flood and ebb) transport of bedload (river-bottom) sand in the Kennebec River estuary results in a "bedload convergence zone" (Anthony, 2009) in Doubling Point Channel. Sand is transported downstream in the river-dominated section of the Kennebec River from Merrymeeting Bay (FitzGerald et al., 2000; Hannum, 1997) where it accumulates in the form of large sand waves in a bedload convergence zone. These sand waves are what need to be periodically dredged by the US Army Corps of Engineers.
>
> Downstream of Doubling Point, sand on the river bed can be carried upstream by flood currents that are stronger than ebb currents (using salinity as a conservative tracer in data provided in Larsen and Doggett, 1976). Tidal mean velocities at Hospital Point (at the south end of Doubling Point Channel) measured in September 1994 show net northerly currents near the river bed (Mayer et al., 1996, Figure C.6.4) as do measurements in May 1994 near Bluff Head (Mayer et al., 1996, Figure C.3.1). Flood velocities near the river bed reported by Mayer et al. (1996) were in excess of 25 cm/sec and sufficient to move sand (Dyer, 1986; Gadd et al., 1978). Thus sand can be carried upstream to the bedload convergence zone from south of Doubling Point.
>
> Over a period of decades or longer, spring floods turn the entire river to freshwater and tidal circulation is suppressed. Periods of river flooding can result in river-bed sand being carried toward the coast and Popham Beach (Fenster et al., 2001; FitzGerald et al., 2000). Fine-grained sediment (silt and clay) also exits the estuary by being carried in suspension (Stumpf and Goldschmidt, 1992) out the river mouth near Popham Beach during floods.
>
> In short, the sand waves at Doubling Point Channel form and re-form because that segment of the Kennebec River is a bedload convergence zone. River and tidal currents as well as the shape of the bedrock channel of the Kennebec River preferentially deposit and accumulate sand in this section of the river. I expect removing sand from the channel by dredging will be replaced by other sand within the Kennebec River. Without further study of the river's sand budget it is not possible at this time to say with certainty what volume of sand could be removed from the river that would result in permanently deepening the channel at Doubling Point Channel (to avoid the need for future dredging) or what the habitat effects of such a removal would be. Permanent removal of large volumes of sand from portions of the river near Bath could possibly affect Popham Beach in the future. Disposal of sand within the Kennebec River is certain to avoid and minimize long-term beach impacts.[i]

This detailed, foot-noted, up-to-date scientific information, intelligently reviewed, and which notes areas of uncertainty and inadequate data that warrant further review, is a model of the type of scientific discussion needed to comply with the 40 CFR 230 factual determinations and which would provide an adequate basis for informed review by concerned parties.

It should be noted that Mr. Dickson alludes to the fact that there is some quantity of dredging and removal of sediment that appears to have no significant impact; for instance the ways and piers, which are dredged annually by BIW and disposed of at upland sites. There also may be some management approaches that require less dredging at Doubling Point, and it appears that progress is being made on that goal. The current period is the longest that Doubling Point channel has gone without dredging since 1950. Since the Doubling Point channel has not been dredged for almost nine years, continuing to look for ways to work with the forces of nature should be encouraged. For instance, the Navy originally requested dredging in time to allow the Spruance to exit the river for sea trials in February and March. Because that was logistically impossible, the USACE documented a deeper channel outside the federal navigation channel and, using a local river pilot, BIW was able to safely transit the river. This approach could be repeated in September and would enable more time to determine a dredging regime that complies with the Section 230 requirements and that has less impact on the river and other users of the river.

Another solution the Corps should evaluate – given the rapid reloading of sediment at Doubling Point – is whether a dredge-only technique could enable the Spruance to safely exit the river by knocking the peaks of the Doubling Point sand waves into the troughs, and thus eliminate the need to dispose of 50,000 cy of dredge spoils in August, when the potential for harms to the river, clamflats, endangered species and other resources is greatest. It is my understanding that this approach is used by the USACE on the Mississippi River. Another approach would be minimal dredging and disposal, instead of over-dredging.

Additionally, over the long term, the Corps should work to understand the amount of sediment that can be removed annually that would be considered insignificant. This would put some parameters around the sand-sediment loading question.

From verbal discussions with Mr. Kavanaugh, it appears that the Navy and BIW have been suggesting the channel needed to be dredged for a few years now, however the sands kept shifting sufficiently that dredging was not required. This supports the notion that a minimal dredging approach might keep the federal navigation channel open with far less impact than current practices. The dredging disposal site regulations (40 CFR 230) require that practicable options that have a smaller environmental impact be permitted, while in-water disposal with a larger environmental impact be prohibited.

Evaluation of Whether Sediment Movement From Popham Beach Dredging and Disposal at Jackknife Ledge Contributes to Erosion of Popham Beach.

The dramatic erosion that has occurred at Popham Beach since 2003 until the Morse River broke through the sand bars off the mouth of the river, has been devastating for the health of the Popham sand dune system.

Mr. Dickson has provided excellent documentation and information on the extensive erosion that has been seen at Popham Beach.[2] The question of whether disposal in the vicinity of Jackknife Ledge has an impact on the sandbars that block the Morse River was not directly addressed by Mr. Dickson or in the current draft EA, and is an important consideration. Concerns that the erosion at Popham Beach may be linked to dredging and disposal activities in or near the Kennebec River was voiced in the first Environmental Assessment prepared in 1980 for the dredging and in-water disposal for the Lower Kennebec River. However, the 2011 Draft Environmental Assessment does not discuss erosion at Popham Beach or provide any information about the current scientific understanding of the Popham Beach erosion/deposition system and how it relates to off-shore sand bars and disposal at Jackknife Ledge.

The 1980 EA, over 30 years old, discussed the controversy and on page D-2 pointed out the need for further investigation:

> *There is at least a possibility in some people's opinion that Corps dredging in the Kennebec River has resulted in the erosion that Popham Beach is now experiencing by depriving it of sand.*
>
> *This . . .point demands further investigation, as it finds the State of Maine and the Corps holding differing opinions on cause and effect relationships of the erosion of Popham Beach. The State of Maine (specifically a former State Geologist) believes that a strong causal relationship exists.*
>
> *It is the position of the Corps of Engineers that no definitive link between dredging and Popham Beach erosion has been shown.*

In part to address this concern, the Corps started disposing of Popham Beach dredge spoils at Jackknife Ledge (JKL) in order to keep the materials within the Popham and Seawall Beach sand budgets. But an inadvertent and unintended consequence of this practice may have been to influence the buildup of the sandbar at the mouth of the Morse River (directly opposite JKL), which started by 2003, worsened in 2005, and continued until the sand bars were broken in 2010. This sandbar caused diversion of the Morse River to the east, severely eroding Popham Beach State Park and threatening to undercut the bathhouse there. If additional dredging disposal from this project contributes sediment that rebuilds the sand bar system, erosion may again occur. In order to comply with USACE regulations, no further disposal at JKL should occur until competent scientific evidence shows that dumping at Jackknife Ledge does not build the sandbar off the mouth of the Morse River. *See* 40 CFR 230.11 (a) ("Potential changes in substrate elevation and bottom contours shall be predicted on the basis of the proposed method, volume, location, and rate of discharge, as well as on the individual and combined effects of current pattern, water circulation, wind and wave action, and other physical factors that may affect the movement of the discharged material."). In other words, prior to disposal, the Corps must identify how that disposed material may affect other resources.

[2] See:
http://www.maine.gov/doc/nrimc/mgs/explore/marine/sites/nov08.htm
http://www.maine.gov/doc/nrimc/mgs/explore/marine/sites/mar08.htm
http://www.maine.gov/doc/nrimc/mgs/explore/marine/sites/may09.htm
http://www.maine.gov/doc/nrimc/mgs/explore/marine/sites/jan10.htm

Impacts to Clam Flats From Dredging and Disposal.

Although the Draft EA concludes that the Doubling Point dredging and Kennebec Narrows disposal will not impact downstream clamflats, that position is contradicted by the experience of lifelong clammers in the region (see Comments from the Phippsburg Shellfish Committee) and by my own experience with the 2009 disposal. In Nov. 2009, disposal of just 18,750 cy of "clean sand" resulted in deposition of thick mud and muck on my shoreline, and similar deposition at the marshes immediately downstream at Bluff Head. No tests or surveys were done to establish how far the deposition extended. However, it seems reasonable to conclude that three to five straight weeks of hourly dumping of 50,000 cy of dredged material at the Kennebec Narrows will entrain far more sediment in the water. Given the strength of the tides and currents, it is accepted that the sediment will not stay in the disposal area, but rather will be transported upstream and downstream and that sediment will settle out on riverbanks, marshes and flats.

Related to the contention that dredging and disposal disrupts the clam flats due to particles clogging the clam breathing holes, the draft EA states on page 20, "*Discussions in the previous section show that the disposal of material at the in-river disposal site would settle out before reaching the tip of Bluff Head".* I strongly question whether the discussions in the previous section can determine that "the disposal of material at the in-river disposal site will settle out before reaching the tip of Bluff Head". This statement has so many site-specific criteria, including the current velocity, the material being disposed, and other material being disturbed near the disposal site. The previous section refers to dredging that was done with mechanical dredge equipment, dredging that was done in the Delaware River which does not have the current velocity of the Kennebec, and the Kennebec Narrows Water Quality Certification study performed by Normandeau Associates in 1997.

The Normandeau study's methodology is reviewed on page 4-5 in the March 21, 2011 comments submitted to Maine DEP and attached as Appendix 1.

As an overview, the problems with relying on the Normandeau study to make a determination that sediment at the in-river disposal site would settle out before reaching Bluff Head, include that the study had a skewed baseline, only monitored the first day of material disposal, only monitored the mid-level and bottom of the river, not at the surface, and only monitored at one location south of the disposal site, at a given time, hundreds of yards away from the disposal area, which may not be indicative of the real turbidity impact.

On page 21, the draft EA, also refers to the Larsen 1992 study, "A Final Report on the Effects of Dredging and Spoil Disposal on the Sediment Characteristics of the Clam Flats of the Lower Kennebec Estuary". The EA states, "The study did not identify any relationship between dredging or disposal of dredged material and sedimentary alterations on the Kennebec River clam flats."

Having looked closely at the study's methodology section, and measurement techniques, it is clear the study did not evaluate whether particles clog the clam breathing holes. Therefore, I

don't believe the study should be relied on as proof that dredging and disposal does not disrupt the clamflats due to sediment clogging the clam breathing holes.

Requirements of 40 CFR 230.

The remainder of my comments discuss the evaluations that the dredging disposal site approval regulations require.

40 CFR 230.1(c): Fundamental to these Guidelines is the precept that dredge or fill material should not be discharged into the aquatic ecosystem, unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or in combination with known and/or probably impacts of other activities affecting the ecosystem of concern.

The Kennebec Narrows disposal site is a rocky, deep, narrow (300 yards) channel with strong currents, eddies and upwelling. It is a critical and very biologically rich area: all the aquatic life that rides the currents up and down the Kennebec transits the narrows. Since it is a fertile fishing ground, it attracts diving ducks, birds, birds of prey and seals. Biological impacts to this rich aquatic environment have not been studied at all, but I believe are significant and long lasting. It is incumbent on the applicant proposing to use an in-water disposal site that has not been pre-approved, to provide specific quantitative information to make the determination of impact.

40 CFR 230.5 ***General procedures to be followed.***

In evaluating whether a particular discharge site may be specified, the permitting authority should use these Guidelines in the following sequence.

(a) In order to obtain an overview of the principal regulatory provisions of the Guidelines, review the restrictions on discharge in 230.10(a) through (d), the measures to minimize adverse impact of subpart H, and the required factual determinations of 230.11.

Although the permitting authority likes to rely on the historic use of the Kennebec Narrows disposal site as justification for why it should continue to be used, that logic does not work in the case of the Kennebec narrows. Although not rigorously studied, strong freshets do clear the area of prior dredge material every few years according to the Corps, and that seems consistent with the bathymetry studies that I have reviewed. Unfortunately, though the site may eventually cleanse itself and be ready to recreate its natural habitat, repeated disposal events prevent rehabilitaton. Time after time, this area is subjected to dumping of massive volumes of dredged materials, and other areas are then subjected to additional sedimentation as this disposed material migrates through the aquatic environment.

The May 1992 US Army Corps of Engineers new England District Brochure on its Dredged Material Program, addresses choosing a dredge disposal site on page 7:

Most locations are specifically chosen to ensure that disposal sites are not situated in areas with strong bottom currents which might cause erosion of the disposed material. During the disposal site selection phase, all proposed sites are also studied to determine bottom topography, sediment type (such as sand or mud) fisheries resources, and local bottom-dwelling

"benthic" communities. In addition, the levels of trace metals and hydrocarbons normally found in the sediment and in the body tissue of the local marine animals are determined.

The primary concerns during most disposal operations are that the dredged material is placed accurately at the site, that the material covers as small an area as possible, and that it remains there. Precise electronic navigation, buoys to mark actual disposal point and on-site disposal inspectors are all used to ensure compliance.

None of the dredge disposal management techniques that are described in this brochure including re-colonization studies, assessing the physical integrity and stability of the disposal mounds, and post-disposal monitoring of the aquatic environment are being done at the Kennebec Narrows. If the Kennebec Narrows is going to continue to be used as a disposal site, the management controls to ensure that the disposal is done properly and the ongoing monitoring should be instituted as part of the permit conditions.

40 CFR 230.11 Factual Determination.
The determinations of effects of each proposed discharge shall include the following:

(a) Physical substrate determination.
Determine the nature and degree of effect that the proposed discharge will have individually and cumulatively on the characteristics of the substrate at the proposed disposal site.

Depth of Disposal Area.

The depth of disposal is inaccurately described and does not comply with 40 CFR 230 which requires extensive information about the disposal area, the dredged material, how the dredged material will effect the disposal area and its surroundings physically, chemically and biologically.

The *Sampling and Analysis Plan for Kennebec River Federal Navigation Project, Bath and Phippsburg*, from Phillip Nimeskern dated January 26, 2011, states that, "[t]he material from the Long Reach area will be disposed of in a 99' deep portion of Fiddler's Reach." However, the Bathymetric surveys show that the disposal area ranges from about 45 feet to a maximum of 93.5 feet. See also Draft EA at 11. Thus, effectively there is no place in the Kennebec Narrows within the designated 500 X 500 foot disposal area that also complies with the Samplying Analysis depth requirement. When discrepancies like this are realized, the application should be amended to reflect accurate information, thus maintaining the integrity of the permitting process. Hopefully that will be done with this draft document.

Physical and Chemical Environment.

The draft EA states in the physical and chemical environment section that the Kennebec Narrows disposal site has a maximum flood of 2.5 knots and a maximum ebb of 3.0 knots, but the statement does not indicate if this is on the surface, or near the bottom. Especially because it is not typical that disposal sites should be of such high current, the fact the current value is stated without any context about its suitability as a disposal site indicates this section needs improvement.

The comments by Dr. Dickson should be discussed here. Areas of discrepancy included that the disposal area is not contiguous to the dredging area, is in a different area geologically, and is not a convergence zone. Besides spreading the dredged material

into the intertidal zones and both upstream and downstream, there is a general movement of bottom sediment upstream, back to the Doubling Point channel, so all of this money, effort and impact, is for no long term purpose. Thus advance dredging, or over-dredging makes little sense. Those would be important factual details to discuss here.

The fact that the disposal site has been show to be a rocky bottom[3], not sandy, nor muddy, and therefore inconsistent with discharging dredged material should also be discussed in this section.

Historical references from 1967 and 1981 were quoted, but the extensive 1980 Environmental Assessment of 60 pages was not referenced.

On page 2, of the 1980 Environmental Assessment it says:

> *The proposed site has been questioned by representatives of both the Maine Department of Marine Resources and the Maine Department of Environmental Protection. Questions regarding the fate of the material after dumping, as well as questions on the impact of the dumping on resident marine life are unresolved. As a result, alternate land sites and open water sites have been investigated.*

Strong comments against using the Kennebec Narrows site for disposal were submitted by Fish and Wildlife. George Beckett wrote,

> *1. Pre-dumping and post-dumping soundings be performed on the riverine dump site.*
> *2. Any future dredging only be conducted during the months of October and November.*
> *3. A suitable "on land" disposal site must be secured and utilized including beach restoration where applicable.*

40 CFR 230.11(a) *Consideration shall be given to the similarity in particle size, shape, and degree of compaction of the material proposed for discharge and the material constituting the substrate at the disposal site.*

No description of the natural substrate was given in the EA.

40 CFR 230.11(a) *Any potential changes in substrate elevation and bottom contours including changes outside of the disposal site which may occur as a result of erosion, slumpage, or other movement of the discharged material*" must also be analyzed.

Appendix 1 does provide an edited version of a study by William Hubbard, "Analysis of Survey Data Kennebec River Disposal Site" Sagadahoc County, Maine. The study monitored the disposal site one month prior to disposal, immediately after disposal operations and then 10 months later. Since the full report was not included in Appendix 1, only an edited version, making comments is difficult. With enhanced computing power, many regulatory agencies now put all background documents and comments on the

[3] From discussion with S. Dickson and from "Coastal Marine Geologic Environments of the Phippsburg Quandrangle, Maine. B. Timson 1976 Open File No. 76-120.

internet. I'd encourage the USACE to look at providing information in that manner, rather than in paper form. Then providing the whole document would be easy.

The report was unable to draw many conclusions, because the volume of additional sand that accumulated between the pre-dumping survey and the end of the dumping appeared to be 4 times the disposed amount. The 500 sq. foot disposal area instead of showing 38,000 cubic meters of sand deposition, the quantity dredged, showed 67,500 cubic meters, with 10 feet of average sediment accumulation.

One possible explanation for the much higher than expected depth reduction impact in the disposal area, comes from my having seen how poorly compacted the muck (from the BIW 2009 dredging) is in the intertidal zone. Perhaps some, if not all, of the additional "volume" is due to water entrainment and the compactibility of the dredged material. Unfortunately, by limiting of the study to the 500 foot navigation channel, information about dispersion into the rest of the lateral riverbed was not analyzed. Overall the conclusions were that more directed surveys needed to be done, and that the most significant impacts are confined to the disposal area and the 1000 foot area south of the disposal area. Note: From the edited version it is not clear if the study actually looked for impacts south of 1000 feet or not. That is why seeing the full study is important. Seemingly just a typo, but Table A1 needs to be corrected because the dates of the sampling are listed as T1 (6-9 Oct 86), T2 (3 Nov 86), T3 (16 Sep 86); whereas the accurate dates appear to be 6-9 Oct 1981, 3 Nov 1981, and 16 Sep 1982.

It was informative that over the time it took to dispose of 50,000 cubic yards of sediment, the disposal area shallowed by 10 feet and the two 500x500 foot segments to the south of the disposal area also shallowed (due to material deposition) by 4.5 feet.

Unfortunately Mr. Hubbard was not teamed with a biological investigator, so no impacts to the biota were studied during the huge sedimentation. Overall, the draft EA did not determine the nature and degree of effect that the proposed discharge will have individually and cumulatively.

(b) **Water circulation, fluctuation, and salinity determinations.**

The Narrows are a complex system and although this study was a good beginning, no analysis of potential significant effects on the current patterns, water circulation, normal water fluctuation and salinity on the basis of the proposed method, volume, location, and rate of discharge was done. Although most of these effects might be assumed to be small, a written discussion should document that conclusion. The impact of the sedimentation on bottom currents may not be insignificant. Overall, the draft EA did not determine the nature and degree of effect that the discharge will have on water circulation, fluctuation, and salinity.

(c) **Suspended particulate / turbidity determinations.**

Page 18 discusses the 1997 Normandeau study and the Kennebec Narrows (Bluff Head) disposal area and repeats the conclusion that "turbidity levels were low, before, during and after the November 1997 dredging." A review of the Normandeau study was done for the comments submitted to Maine DEP for their water quality certification and for the USACE NRPA permit application comment period and is also discussed in these comments on page 5.

The major problems were that the Normandeau study used a rain event as a baseline, measured turbidity only in the mid and bottom of the river bed, the two sampling locations were a half mile to one mile from the disposal site, and that the full length of disposal activity was not evaluated for turbidity. Also, the Normandeau study monitored work by a mechanical dredge with infrequent disposals, which, as the CENAE report shows, is considerably different than a hopper dredge working 24/7 with hourly disposals. Further, given the levels of mud still remaining from the last disposal event, the 2011 evaluation should evaluate whether hopper dredge disposal – which is reported to create significant outward spread of the discharge – will exacerbate turbidity by picking up additional materials. For these reasons, the project cannot rely upon the Normandeau study. Accordingly, the draft EA does not determine of the nature and degree of effect individually and cumulatively considering the proposed method, volume, location and rate of discharge and water circulation, wind, and other physical factors.

(d) **Contaminant determinations.**

Determine the degree to which the material proposed for discharge will introduce, relocate, or increase contaminants.

The sampling plan for the two dredging areas is detailed in the January 26, 2011 by Phil Nimeskern to William Kavanaugh. The samples must be core samples, taken down to the depth of the proposed dredging level. If the samples show stratification, subsamples should be made of each layer. Each core or core layer should be individually analyzed for sediment grain size and the results reported with a copy of the boring log.

In the DEP comments, I raised the question of the missing sample G. The March 16, 2011 memorandum discussed below, answers that question by documenting that Sample G was attempted but not successful, because the location for sample G was a rock ledge. However, the documentation does not include where and at what depth that rock ledge is in the navigation channel.

In a memorandum dated March 16, 2011, Phillip Nimeskern, authored a memo "*Suitability Determinations for Kennebec River Federal Navigation Project, Bath and Phippsburg, Maine."*

The CENAE notes that they are proposing to hydraulically dredge the reaches, although mechanical dredging might be used instead, depending on available equipment.

Since it appears that either dredging method is capable of working in the Kennebec River, an analysis of the impact on turbidity and suspended materials would be useful. A power point presentation by Ms. Lackey US Army ERDC, Vicksburg, MS in 2009, titled "Prediction of Suspended Sediment Due to Dredging at the Willamette River" showed that for a dredging of 50,000 cubic yards of material with a much higher percentage of fines (74%), there was a significant difference between the number of pounds of re-suspended sediment. The hopper dredge was three times worse, re-suspending 265,000 pounds of sediment. It would be helpful if the USACE compared the turbidity, noise, cost, practicality and time impacts between using a hopper dredge or mechanical dredge. http://el.erdc.usace.army.mil/workshops/09sep-dots/36_WillametteRiver_Lackey.pdf

Quantitative Comparisons Dredging Sources

Total Sediment Dredged =50,000 cy

	Clamshell	Hopper
Dredging Time	4 days	1.125 days
Total Mass (kg)	15.2 million	15.2 million
Total Resuspended (kg)	40 thousand	120 thousand
% Resuspended	0.79 %	2.6 %

Prior to the public hearing, the USACE refused to bring a sample of the dredge material. Now that it is known that core samples were taken, I once again request that the samples be provided for independent review. Considering the muck that has accumulated on my intertidal zone, viewing a portion of each core sample could go a long way to alleviating the feeling of being uninformed.

The purpose of the March 16 Nimeskern memo is to describe the USACE rationale for why no testing of any of the core samples (other than for grain size) is necessary. The report is based on 40 CFR 230.60(a)-(d). 40 CFR 230.60(a) states:

(a) If the evaluation under paragraph (b) indicates the dredged or fill material is not a carrier of contaminants, then the required determinations pertaining to the presence and effects of contaminants can be made without testing. Dredged or fill material is most likely to be free from chemical, biological, or other pollutants where it is composed primarily of sand, gravel, or other naturally occurring inert material. . . However, when such material is discolored or contains other indications that contaminants may be present, further inquiry should be made.
(b) The extraction site shall be examined in order to assess whether it is sufficiently removed from sources of pollution to provide reasonable assurance that the proposed discharge material is not a carrier of contaminants.

Based on the fact that the Army Corps has refused to test the material for 30+ years, even though the location is close to discharges for the city of Bath, near known areas of historical contamination, and in the same reach as an industrial facility, selective testing should be done to determine an actual background of contamination or cleanliness. Analysis for heavy metals, petroleum and fecal coliform from three samples at each dredge site will be relatively inexpensive and provide tremendously more information than currently exists.

(c) To reach the determinations required by Section 230.11 involving potential effects of the discharge on the characteristics of the disposal site, the narrative guidance in subparts C through F shall be used along with the general evaluation procedure in 230.60. "*Where the discharge site is adjacent to the extraction site and subject to the same sources of contaminants, and materials at the two sites are substantially similar, the fact that the material to be discharged may be a carrier of contaminants is not likely to*

result in degradation of the disposal site. In such circumstances, when dissolved material and suspended particulates can be controlled to prevent carrying pollutants to less contaminated areas, testing will not be required."

Based on a reasonable reading of the section, and the analysis by Dickson, the Doubling Point channel and the Kennebec Narrows are clearly neither "adjacent" nor do they contain materials that are substantially similar. The USACE conclusion to the contrary is not supportable.

The Nimeskern memo states that:

(a) Further testing is not necessary as it can be determined that the sediment is not likely a carrier of contaminants. In both areas the sediment samples were predominately sands and gravel, having 0.1% to 0.8% fines. See attached table for details.

This is not accurate. The Doubling Point samples range from 0.1% to 1.1% silt and clay. Popham Beach ranges from 0.5% to 0.8% silt and clay. And, since the core samples have not been disclosed, it is unclear whether there are indications that contaminants may be present, such as discoloration. But more critically, as stated above, the exclusion in (a) is only valid if the proposed discharge material is not a carrier of contaminants. This is shown by applying (b) *The extraction site shall be examined in order to assess whether it is sufficiently removed from sources of pollution to provide reasonable assurance that the proposed discharge material is not a carrier of contaminants.*

In prior submissions, the USACE has used section (b) to maintain that unless there was a documented spill since the previous dredging, no sampling was necessary. In this submissions case, USACE does say that section (b) does not exclude the dredged material from testing, since there was a spill of 40 gallons of hydraulic oil. However, even though by section (b) testing should be required, USACE relies on section (c) to maintain, nonetheless, that testing is not required.

(c) The material to be dredged and the material at the disposal site are adjacent, composed of the same materials and subject to the same sources of contaminants. Further testing is not required.

I respectfully disagree with the USACE regulatory determination that the dredging site and disposal site meet the requirements of (c), therefore, some additional testing of the dredge samples is warranted.

40 CFR 230.11(d) **Contaminant determination.**

Determine the degree to which the material proposed for discharge will introduce, relocate, or increase contaminants.

With some test data from heavy metals, petroleum contamination and fecal coliform, all of which we're hoping to be below any level of concern, the hypothesis of safety can be confirmed.

As to the contamination with silt and clay, an analysis of the impact of the slug of silt and clay will have to be made, in order to determine the significance.

Since, the draft EA did not include any chemical or bacteriological analysis of the samples, the EA has not provided critical chemical and bacteriological information to determine the nature and degree of effect that the proposed discharge will have individually and cumulatively.

Conclusion: As a first step to using the Kennebec Narrows (N of Bluff Head) disposal site or the Jackknife Ledge disposal site, scientific work has to be done and the EA has to be updated to provide the required quantitative information on which to base a finding of no significant harm, least environmentally impactful, practicable, disposal option, and actions for minimizing adverse impacts.

Although these comments have focused on the regulatory requirements of 40 CFR 230, to document the type of work that must be done prior to determining whether an area can be approved for in-water dredging disposal, I'd like to conclude by providing a path forward.

Encourage alternate solutions to dredging in August such as use of a local pilot who knows the channels, or utilize a minimized dredging program, with an approved disposal option to allow the Spruance to transit safely.

In addition, the dredging and disposal in the Lower Kennebec River needs:

1. A transparent and detailed evaluation of the impacts of dredging and disposal especially focused on the impacts to aquatic life.
2. Adherence to the Clean Water Act (CWA) and the Maine Natural Resources Protection Act (NRPA) requiring that water quality standards not be violated when dredging is performed
3. The dredging should be done using best practices to reduce turbidity, siltation and re-deposition of materials.
4. Alternate disposal methods: Dispose of the material upland in locations that would benefit from the material.
5. Avoid over-dredging: Doubling Point and Popham Beach are active areas that re-shoal rapidly, the data doesn't show it extends the overall time between dredges.
6. Improve the Environmental Assessment by the USACE to include the BIW dredging and disposal information, because that is part of the cumulative impacts.

Thank you for the opportunity to comment on the August 2011 proposed dredging and disposal, and if I can provide electronic or paper copies of any of the background documents that I referenced, please let me know.

Respectfully submitted,
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Jay Clement, USACE
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[i] Footnotes included in Stephen Dickson's February 24, 2011 email on Doubling Point channel sediment movement.

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