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June 27, 2013

Office of Environmental Information
(Mail Code: 28221T)
Docket #EPA-HQ-ORD-2013-0189
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Dennis J. McLerran, Regional Administrator
U.S. Environmental Protection Agency, Region 10
Regional Administrator's Office, RA-140
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

Re: Docket # EPA-HQ-ORD-2013-0189 – Comments on Appendix J of second draft "Assessment of Potential Mining Impacts on Salmon Ecosystems of Bristol Bay, Alaska," with discussion of prohibitions and restrictions implied by the assessment.

Dear Mr. McLerran and other EPA Officials:

First, thank you and EPA staff and contractors for all efforts on this matter. Please convey my appreciation as appropriate.

In these comments, I will focus on (1) suggestions to improve Appendix J on compensatory mitigation, and (2) prohibitions and restrictions implied by the assessment for purposes of § 404(c) of the Clean Water Act. I am doing so because, when the assessment is complete, the issue will be whether to invoke § 404(c).

Resolving that issue will require EPA to apply the § 404(b)(1) Guidelines[1] to the facts. The executive summary of the assessment summarizes the facts with respect to the context (pp. ES 1 – ES 14) and unavoidable and likely impacts (pp. ES 14 – ES 26). However, the assessment is not regulatory action. For the most part, it addresses only a portion of the Guidelines, and only in Appendix J with respect to regulations that govern compensatory mitigation. Compensatory mitigation applies to impacts that would occur despite measures to avoid or minimize adverse effects. Impacts that would occur, or are likely to occur, and which are unacceptable to EPA, can be the basis of a § 404(c) determination and any prohibitions or restrictions therein. Appendix J concludes that compensatory mitigation faces challenges in this situation and questions whether sufficient measures exist that could address impacts. Hence, my focus is on suggestions to improve Appendix J and identify the prohibitions and restrictions implied by the assessment.

A. Background.

In May 2010, the tribal councils of Nondalton, Koliganek, New Stuyahok, Ekwok, Curyung, and Levelock, joined by the Alaska Independent Fishermen's Marketing Association (AIFMA), and my co-counsel and I, filed the initial request that EPA commence a public process

[1] 40 CFR Part 230.

under § 404(c) of the Clean Water Act to consider whether to prohibit or restrict discharges of dredged or fill material into waters of the United States, including wetlands, in the Kvichak and Nushagak River drainages of Alaska, wherever such discharges would be associated with potential mines at metallic sulfide deposits, including the Pebble deposit, in those drainages and would cause unacceptable adverse effects on fish, wildlife, fisheries, subsistence, and public uses subject to protection under § 404(c). The broad approach is consistent with the two purposes served by making a § 404(c) determination in advance of permit applications.[2] In February 2011, EPA announced that it had commenced this watershed assessment process to assist future decisions with respect to potential mining of such deposits in the Kvichak and Nushagak drainages. In 2012, EPA released a draft assessment for public and peer review. In April 2013, EPA released its second draft assessment for public and peer review.

Section 404(c) authorizes EPA to prohibit, withdraw, restrict or deny permits for discharges of dredged or fill material, including mining wastes, at defined sites into waters of the United States, including wetlands, whenever EPA determines after notice and opportunity for hearing that such discharges would have unacceptable adverse impacts on fisheries, wildlife, water supplies or recreation. This includes subsistence, commercial, and sport fisheries. An "unacceptable adverse effect" is an "impact on an aquatic or wetland ecosystem which is *likely* to result in significant degradation of municipal water supplies (including surface or ground water) or significant loss of or damage to fisheries, shellfishing, or wildlife habitat or recreation areas."[3] In evaluating unacceptability of impacts EPA considers "relevant portions" of the § 404(b)(1) Guidelines at 40 CFR Part 230.[4] In 2008, the EPA and the Department of the Army (DA), Corps of Engineers (Corps), jointly adopted regulations on compensatory mitigation as Subpart J of the § 404(b)(1) Guidelines.[5] Therefore, in evaluating unacceptability of adverse effects, EPA may consider relevant portions of these regulations on compensatory mitigation.

With respect to a mine at the Pebble deposit, the Assessment, pp. ES 14 - ES 15, identifies the following unavoidable effects on fishes resulting from habitat loss and modification directly in the "footprint" area of mining activity and indirectly downstream because of habitat destruction:

1. Loss of 38, 90, and 145 km (24, 56 and 90 miles) of streams in the footprint of the mine pit, TSFs and waste rock piles, due to elimination, blockage, or dewatering of streams under the Pebble 0.25, 2.0, and 6.5 scenarios, respectively. These losses would translate to losses of 8, 24, and 35 km (5, 15, and 22 miles) of streams known to provide spawning or rearing habitats for coho salmon, sockeye salmon, Chinook salmon, and Dolly Varden.
2. Altered stream flow due to retention and discharge of water used in mine operations, ore processing, transport, and other processes would reduce the amount and quality of fish

[2] In 1979, EPA adopted the § 404(c) regulations at 40 CFR Part 231. In doing so, EPA explained that § 404(c) determinations prior to an application for a § 404 permit served two purposes: (1) to facilitate planning by developers and industry so as to eliminate frustrating situations in which someone spends time and money developing a project for an inappropriate site and learns at an advanced stage that he must start over, and (2) to facilitate comprehensive rather than piecemeal protection of wetlands. *See* 44 Fed. Reg. 58076, 58077 (Oct. 9, 1979).

[3] 40 CFR § 231.2(e) (italics added).

[4] 40 CFR § 231.2(e).

[5] See at 40 CFR §§ 230.91 -230.98 and 33 CFR §§ 332.1 -332.8.

habitat. Reductions in stream flow exceeding 20% would adversely affect habitat in an additional 15, 26 and 54 km (9.3, 16 and 34 miles) of streams under the Pebble 0.25, 2.0, and 6.5 scenarios, respectively, reducing production of sockeye salmon, coho salmon, Chinook salmon, rainbow trout, and Dolly Varden. Reduced flows would also result in an unquantifiable area of riparian floodplain wetland habitat being lost or altered in terms of hydrologic connectivity with streams.

3. Loss of 5.0, 12.4 and 19.4 km2 (1,200, 3,000 and 4,800 acres) of wetlands in the footprints of the Pebble 0.25, 2.0, and 6.5 scenarios, respectively, would reduce off-channel habitat for salmon and other fishes (Figure ES-6). Wetland loss would reduce availability of and access to hydraulically and thermally diverse habitats that can provide enhanced foraging opportunities and important rearing habitats for juvenile salmon.
4. Indirect effects of stream and wetland losses would include reductions in the quality of downstream habitat for coho salmon, sockeye salmon, Chinook salmon, rainbow trout, and Dolly Varden. These indirect effects cannot be quantified, but likely would diminish fish production downstream of the mine site. Indirect effects would be caused by the following alterations.
   a. Reduced food resources would result from the loss of organic material and drifting invertebrates from the streams and streamside wetlands lost to the mine footprint.
   b. The balance of surface water and groundwater inputs to downstream reaches would shift, potentially reducing winter fish habitat and making streams less suitable for spawning and rearing.
   c. Seasonal temperatures could be altered by water treatment and reduced groundwater flowpaths, making streams less suitable for salmonids.

With respect to a mine at Pebble, the Assessment, pp. ES 18, also identifies likely impacts. Most are along a road and pipeline corridor. These include the following:

1. The Watershed Assessment calculates the rate of failures of culverts to allow fish passage post-operation of Pebble mine at 11 to 21 salmonid streams suffering from impeded fish passage.
2. With respect to failure of pipelines carrying ore concentrate, the Assessment estimates one to two stream-contaminating spills in 78 years and two wetland-contaminating spills in 78 years.
3. With respect to failure of pipelines carrying diesel fuel, the Assessment makes the same estimate of one to two stream-contaminating spills in 78 years and two wetland-contaminating spills in 78 years.
4. With respect to failure of pipelines carrying process water, the Assessment makes the same estimate of one to two stream-contaminating spills in 78 years and two wetland-contaminating spills in 78 years.
5. Similarly, the Assessment calculates the rate of accidents of trucks carrying chemicals used in mineral processing and the rate of near-stream spills at two per 78 years.
6. In the same vein, the Assessment concludes that systems for collection and treatment of contaminated water are certain to fail after Pebble mine is abandoned and water is no longer managed.

Moreover, developing the infrastructure for the Pebble deposit would probably lead to developing several additional mines at other metallic sulfide deposits in the area, and related development. This would have a multiplier effect on unavoidable and likely impacts.

B. Suggestions for Improving Appendix J.

Any discussion of compensatory mitigation must apply the regulations governing compensatory mitigation to the facts. Simply offering factual assertions can create misimpressions, and some of the comments recently filed by Northern Dynasty Minerals, Inc. (NDM) typify such an error. Attachment D of NDM's comments addresses mitigation and Appendix J but never cites to, mentions, or applies the regulations to factual material. The result is that NDM's Attachment D prompts erroneous inferences, such as: (1) that impacts can always be mitigated, even though 40 CFR § 230.91(c)(3) says otherwise, and (2) that EPA should not make a § 404(c) determination if impacts can be mitigated, even though this inference confuses the Corps' authority under § 404(a) to require mitigation under the terms of a permit with EPA's authority under § 404(c) to determine unacceptable adverse effects regardless of mitigation.[6]

Unfortunately, the draft Appendix J also neglects or misplaces a few points about the regulations and invites such misimpressions. So, this suggests how to improve Appendix J.

1. The first two paragraphs of Appendix J should be revised to state threshold matters that help a reader avoid misimpressions fostered by anyone who neglects to apply the compensatory mitigation regulations to the facts.

Section 1 of Appendix J provides an overview of the regulations that apply to compensatory mitigation under § 404 of the Clean Water Act. The first two paragraphs of the overview introduce a summary of the regulations. Those paragraphs should focus on what is most important to say at the threshold in this instance. That includes what is necessary to avoid incorrect inferences such as those mentioned above. I believe that something along the lines of the following suggested alternative may help:

Original Opening Paragraphs in Appendix J, p. 1	My Suggested Alternative
Compensatory mitigation refers to the restoration, establishment, enhancement, and/or preservation of wetlands, streams, or other aquatic resources conducted specifically for the purpose of offsetting authorized impacts to these resources (Hough and Robertson, 2009).[[7]] Compensatory mitigation regulations jointly promulgated by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (ACOE) (40 CFR §§ 230.91 -230.98 and 33 CFR §§ 332.1 -332.8) state that "the fundamental objective of compensatory mitigation is to offset environmental losses resulting from unavoidable impacts to waters of the United	The purpose of the regulations on compensatory mitigation (40 CFR §§ 230.91 - 230.98 and 33 CFR §§ 332.1 - 332.8) is to establish "standards and criteria" for all types of compensatory mitigation of unavoidable impacts to waters of the United States arising from permits granted by the Corps under § 404 of the Clean Water Act (40 CFR § 230.91(a)(1)). The standards and criteria foster reasoned decision-making about mitigation. The regulations are part of the § 404(b)(1) Guidelines. The Corps uses the Guidelines to decide the terms of permits it issues under § 404(a). The EPA uses the Guidelines to decide the terms of §

[6] See Attachment D to NDM comments, May 30, 2013. NDM owns the mining claims at the Pebble deposit is a 50-percent partner in the Pebble Partnership.

[7] EPA should not cite a professional article to describe or define compensatory mitigation when the regulations define "compensatory mitigation" and "compensatory mitigation project." As discussed below, I would start with the purpose of the regulations rather than a definition.

States authorized by [Clean Water Act Section 404 permits issued by the ACOE]" (40 CFR Part 230.93(a)(1)).[8] Compensatory mitigation enters the analysis only after a proposed project has incorporated all appropriate and practicable means to avoid and minimize adverse impacts to aquatic resources (40 CFR Part 230.91(c)). Section 404 permitting requirements for compensatory mitigation are based on what is "practicable and capable of compensating for the aquatic resource functions that will be lost as a result of the permitted activity" (40 CFR Part 230.93(a)(1)). In determining what compensatory mitigation will be "environmentally preferable," the ACOE "must assess the likelihood for ecological success and sustainability, the location of the compensation site relative to the impact site and their significance within the watershed, and the costs of the compensatory mitigation project"(40 CFR Part 230.93(a)(1)). Furthermore, compensatory mitigation requirements must be commensurate with the amount and type of impact associated with a particular Section 404 permit (40 CFR Part 230.93(a)(1)). The regulations recognize that there may be instances when the ACOE cannot issue a permit "because of the lack of appropriate and practicable compensatory mitigation options" (40 CFR Part 230.91(c)(3)).	404(c) determinations it issues to prohibit, withdraw, restrict or deny such permits due to unavoidable or likely unacceptable adverse effects. EPA's authority is independent of that of the Corps. A § 404(c) determination does not require that an unacceptable adverse effect be immitigable to be unacceptable. The regulations expressly state that there may be instances when a permit cannot be issued "because of the lack of appropriate and practicable compensatory mitigation options" (40 CFR § 230.91(c)(3)). Not all unavoidable impacts are susceptible to compensatory mitigation. Moreover, unavoidable and likely adverse effects may be unacceptable under § 404(c) even when compensatory mitigation is available. "Compensatory mitigation" means "the restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved" (40 CFR § 230.92). These methods of mitigation are discussed below in Section 1.1. A "compensatory mitigation project" is "implemented by the permittee as a requirement of a [§ 404] permit (i.e., permittee-responsible mitigation), or by a mitigation bank or an in-lieu fee program" (40 CFR § 230.92). These mechanisms are discussed below in Section 1.2. Compensatory mitigation requirements are based on what is "practicable and capable of compensating for the aquatic resource functions that will be lost as a result of the permitted activity" (40 CFR § 230.93(a)(1)). In determining what compensatory mitigation will be "environmentally preferable," the Corps "must assess [1] the likelihood for ecological success and sustainability, [2] the location of the compensation site relative to the impact site and their significance within the watershed, and [3] the costs of the compensatory mitigation project" (40 CFR § 230.93(a)(1)). Furthermore, compensatory mitigation requirements must be commensurate with the amount and type of impact associated with a particular Section 404 permit (40 CFR § 230.93(a)(1)).

[8] A minor point: Appendix J often erroneously uses "Part" when citing a section of the Code of Federal Regulations rather than a part, or it omits a section sign. It should use a section sign "§".

The foregoing alternative paragraphs have several advantages. First, they start, as the regulations do, by stating that the *purpose* of the regulation is to establish "standards and criteria" for compensatory mitigation. Making that point at the beginning helps everyone to understand that EPA's skepticism that various proposals for compensatory mitigation do not meet the standards and criteria is *reasoned*, and *not arbitrary*. That is vital. It is vital because: (1) courts require reasoned, not arbitrary, decisions, (2) legislators should be interested because they enact and should preserve laws, such as the Clean Water Act, requiring as much, and (3) NDM's comments on Appendix J, in contrast, never mention the regulations, and so, NDM and similar critics cannot claim to be consistent with the standards and criteria or to engage in reasoned rather than arbitrary recommendations. Making that point at the beginning helps everyone discard poor proposals for mitigation, and avoid incorrect inferences that any mitigation might be acceptable or might make impacts acceptable.

Second, the foregoing alternative paragraphs help the reader to understand, first, that the standards and criteria are part of the § 404(b)(1) Guidelines used by the Corps and the EPA in their respective capacities under Section 404, and more importantly, that EPA's authority under § 404(c) does *not* depend on adverse effects being immitigable. This latter point is critical because, unless it is made clearly, EPA's critics are more likely to imply incorrectly that § 404(c) depends on impacts being immitigable. NDM's comments falsely imply as much.

Third, the principle that not all unavoidable impacts are susceptible to compensatory mitigation then *flows naturally* from the fact that standards and criteria exist. It flows naturally because any meaningful standard or criterion may be met, or not met, in a given situation. That point bears directly on this situation. In this situation, the proposals for compensatory mitigation do not appear to meet the standards and criteria, as discussed below and in Appendix J.

Fourth, the definitions of "compensatory mitigation" and "compensatory mitigation project" then lay a foundation for subsequent discussion of mitigation methods in Sections 1.1 and mitigation mechanisms in Section 1.2 [of Appendix j]. The first of the general standards and criteria stated in 40 CFR § 230.93(a)(1) then lay a foundation for subsequent discussion of other, more specific, standards later in the overview of the regulations.

Finally, this alternative draft cites four sections of the regulations in the order in which they are codified: *i.e.*, 40 CFR §§ 230.91(a)(1), 230.91(c)(3), § 230.92, and 230.93(a)(1). In contrast, the original paragraphs discuss § 230.93(a)(1) before § 230.91(c)(3). This lack of proper sequence can mislead readers to infer, incorrectly, that compensatory mitigation is always available, and then overlook the last sentence of the second paragraph which says otherwise, but almost as an after thought. The point that compensatory mitigation is not always available is important, so I made it the topic sentence of the third paragraph.

2. Appendix J should address more thoroughly the requirement that options for compensatory mitigation are assessed in part by the "likelihood for ecological success and sustainability."

Appendix J focuses mostly on whether suitable sites or opportunities for compensatory mitigation exist either within the North and South Fork Koktuli River and Upper Talarik Creek

watersheds,[9] or off-site and/or out-of-kind.[10] The conclusion that adequate sites do not exist would be strengthened by initial and additional focus on whether potential compensatory mitigation projects are likely to be self-sustaining. That is because the regulations, in stating a host of requirements, standards, criteria and considerations throughout 40 CFR § 230.93, begin with the following general requirements and considerations:

> The fundamental objective of compensatory mitigation is to *offset environmental losses resulting from unavoidable impacts* to waters of the United States authorized by DA permits. The district engineer must determine the compensatory mitigation to be required in a DA permit, based on what is *practicable and capable* of compensating for the aquatic resource functions that will be lost as a result of the permitted activity. When evaluating compensatory mitigation options, the district engineer will consider what would be *environmentally preferable.* In making this determination, the district engineer must assess [three criteria]: [1] *the likelihood for ecological success and sustainability,* [2] *the location of the compensation site relative to the impact site and their significance within the watershed,* and [3] the costs of the compensatory mitigation project. . . . Compensatory mitigation requirements must be commensurate with the amount and type of impact that is associated with a particular DA permit.[11]

With respect to the first and second criteria, the regulations provide that compensatory mitigation should occur in the same watershed as the impact and in a location most likely to successfully replace lost functions and services of the waters and wetlands.[12]

Appendix J concludes that because so much of the area is undeveloped, there are not sufficient sites to restore or enhance as compensatory mitigation.[13] In other words, the conclusion of Appendix J is based mostly on the *second* criterion (the location of a compensation site relative to the impact site and their significance within the watershed) and less so on the *first* criterion (the likelihood for ecological success and sustainability).

EPA can strengthen the conclusion of Appendix J that inadequate compensatory mitigation sites exist by revising Appendix J to state clearly how it assesses the *first* criterion. Doing so is important for two reasons. First, the regulations require a mitigation plan for any § 404 permit,[14] and the mitigation plan must consider the practicability of accomplishing ecologically "*self-sustaining*" compensation.[15] Second, in this instance, many of the suggestions that have been made for compensatory mitigation projects in the North and South Forks of the Koktuli River and Upper Talarik Creek would not be self-sustaining. These include proposals to:

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[9] See Appendix J, pp. 8 – 11 (section 3.3.1 through 3.3.1.4).
[10] See Appendix J, pp. 11 – 16 (section 3.3.2 through 3.3.2.7).
[11] 40 CFR § 230.93(a)(1) (italics added).
[12] 40 CFR § 230.93(b)(1). The goal of this watershed approach is to "maintain and improve the quality and quantity of aquatic resources within watersheds through strategic selection of compensatory mitigation sites." 40 CFR § 230.93(c)(1).
[13] See Appendix J, p. 9.
[14] 40 CFR § 230.94(c).
[15] 40 CFR § 230.94(c)(3) (italics added).

remove beaver dams; construct or improve spawning channels; re-connect old stream channels and isolated ponds to the present channel; create habitat by placing boulders, logs and root wads in waters; and improve the water chemistry for biological productivity by managing the effluent of the waste water treatment plant.[16] Such projects would require perpetual maintenance and would not meet the criterion that projects be self-sustaining. Instead, they would require perpetual care to assure that natural processes such beavers and floods that naturally rearrange stream systems, constantly destroying and creating habitat at any given location, would not alter these human constructions, rendering them ineffective as mitigation for lost habitat. Perpetual care and maintenance is required to ensure that these mitigated ecosystems do not continue to operate naturally. As is discussed elsewhere in the assessment, perpetual care is unlikely.

In other words, if EPA elaborates on how it assesses the first criterion, then the result may be that such proposals for compensatory mitigation probably will fail on *one* or *both* of these criteria. They will fail on the first criterion, *i.e.*, the likelihood for ecological success and sustainability, and/or on the second criterion, *i.e.*, the location of the compensation site relative to the impact site and their significance within the watershed.

3. Appendix J should address the first and second criteria in the context of multiple mines, even though those criteria cannot be met for developing the Pebble deposit.

Although proposals for compensatory mitigation of unavoidable impacts of developing the Pebble deposit do not meet the first and/or second criteria stated in 40 CFR § 230.93(a)(1), above, that problem is compounded by the fact that other metallic sulfide deposits exist in the Kvichak and Nushagak drainages, and that other deposits could be mined if the infrastructure necessary to develop the Pebble deposit leads to developing other deposits. However, Appendix J focuses on mitigation of developing the Pebble deposit which is in advanced exploration. Appendix J says nothing directly about other potential mines even though the assessment takes drainage-wide approach and applies to all these potential mines. Moreover, an advance § 404(c) determination makes sense because multiple deposits exist (see footnote 1, above). Therefore, Appendix J should also address compensatory mitigation in the context of multiple mines.

To do so, Appendix J should identify relevant portions of the § 404(b)(1) Guidelines on compensatory mitigation to provide a framework for addressing multiple mines when one is in advanced exploration and others are not. One candidate for that framework is the requirement in the Guidelines that an applicant for a § 404 permit prepare and obtain approval from the Corps of a "Mitigation Plan" prior to issuance of a permit.[17] The Mitigation Plan must include:

(1) a "description of the factors considered during the site selection process," and this "should include consideration of watershed needs, on-site alternatives where applicable, and the practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the compensatory mitigation project site;" and

(2) an "Adaptive Management Plan."[18]

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[16] There have also been proposals to manage stream flows. See Appendix J, pp. 10 - 11. Such proposals involve mitigation by minimizing impact and are not compensatory mitigation.

[17] 40 CFR § 230.94(c)(1).

[18] See 40 CFR § 230.94(c)(4) and 40 CFR § 230.94(c)(12).

"Adaptive Management" means that which "anticipates *likely* challenges associated with compensatory mitigation projects" and "requires consideration of the *risk*, *uncertainty*, and *dynamic* nature of compensatory mitigation projects."[19] An "Adaptive Management Plan" is –

> A management strategy to address unforeseen changes in site conditions or other components of the compensatory mitigation project, including the party or parties responsible for implementing adaptive management measures. The adaptive management plan will guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success.[20]

Thus, when foreseeable and unforeseen circumstances adversely affect mitigation success, the Adaptive Management Plan in theory provides an option, such as an alternative site to replace or supplement the original mitigation project.

However, as a practical matter, metallic sulfide deposits occur in groups. This is the case in the immediate vicinity of the Pebble deposit. Therefore, whenever there are insufficient options for compensatory mitigation for developing one deposit, the theory that Adaptive Management Plans will accommodate failure of mitigation breaks down, not only for that one mine, but even more so for multiple mines in the immediate vicinity. That is because each Adaptive Management Plan is likely to compete with the other Adaptive Management Plans for a limited set of adaptive options in the same vicinity.

4. Appendix J should discuss more thoroughly why preservation of other resources is not an option.

Preservation of other resources as an option for compensatory mitigation requires that all of the following conditions be met:

> (i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;
> (ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available;
> (iii) Preservation is determined by the district engineer to be appropriate and practicable;
> (iv) The resources are under threat of destruction or adverse modifications; and
> (v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).[21]

[19] 40 CFR § 230.92 (italics added).
[20] 40 CFR § 230.94(c)(12).
[21] 40 CFR § 230.93(h).

Where multiple metallic sulfide deposit exist in close proximity, such as in the vicinity of the Pebble deposit, problems will occur in meeting the third, fourth and fifth conditions. With respect to the third condition, it is *impractical* to use preservation as compensatory mitigation for developing any of multiple deposits, because developing any threatens the same area. In that case, the first general criterion of 40 CFR § 230.93(a)(1) – i.e., "the likelihood of ecological success and sustainability" of preservation in the vicinity of multiple deposits – could *not* be met by compensatory mitigation for developing one or some of the deposits. With respect to the fourth condition, most areas in the Kvichak and Nushagak drainages are not under any *threat* of destruction or adverse modification other than from mining. Preservation is not an option outside of the vicinity of the deposits because to do so would not meet the second criterion of 40 CFR § 230.93(a)(1) – i.e., "the location of the compensation site relative to the impact site and their significance within the watershed." With respect to the fifth condition, it will be hard to claim that an area is "permanently protected" when multiple deposits create the same or similar threats, and at least one would be developed so as to require compensatory mitigation. In that case again, the first general criterion of 40 CFR § 230.93(a)(1) – i.e., "the likelihood of ecological success and sustainability" of preservation in the vicinity of multiple deposits – could *not* be met.

5. EPA should state more clearly a conclusion to Appendix J that there is an absence of sites for compensatory mitigation that pass muster with the first and second general criteria.

After an overview of the regulations, Appendix J discusses potential actions that have been offered, conceptually, to address the impacted fish stocks in the North and South Forks Koktuli River and Upper Talarik Creek, including mitigation bank credits, in-lieu fee program credits, beaver dam removal, management of stream flows, construction of spawning channels, and preservation of otherwise threatened areas.[22] Appendix J observes:

> In the context of the [Pebble] mine scenario, the primary challenge to both a watershed approach and on-site compensatory mitigation is the absence of degraded resources and watershed needs within the [North and South Forks Koktuli River and the Upper Talarik Creek] watersheds. Specifically, these three watersheds are largely unaltered by human activities, and there appear to be no sites that a mitigation project could restore or enhance to offset the magnitude of the impact expected from the mine scenario.[23]

The same is true of adjoining watersheds and surrounding Mulchatna River and Iliamna Lake watersheds.

The relative absence of sites needing restoration or enhancement, and of sites or areas otherwise threatened and needing preservation other than from mining, make compensatory mitigation impracticable and unable to meet the general requirements and considerations of 40 CFR § 230.93(a)(1). Accordingly, Appendix J concludes that compensatory mitigation faces

[22] Appendix J, pp. 7 - 11. Management of stream flows is mitigation by minimizing impact and is not compensatory mitigation.
[23] Appendix J, pp. 8 - 9.

"significant challenges" thereby "raising questions as to whether sufficient compensation measures exist that could address impacts of this type and magnitude."[24]

All of the discussion in Appendix J about the facts and the law support a much stronger conclusion. Something like this suffices:

> The immediate and surrounding watersheds are in near pristine condition and face no threats other than from mining. Artificial stream and wetland enhancement efforts in these watersheds require perpetual maintenance to be effective, which is unlikely to occur. The relative absence of sites needing restoration or enhancement, and of sites or areas otherwise threatened and needing preservation other than from mining, make compensatory mitigation impracticable and incapable of meeting the requirements, conditions, and criteria stated in the regulations.

C. Prohibitions and Restrictions Implied by the Assessment.

1. Unavoidable impacts: They defy compensatory mitigation, are unacceptable, and a § 404(c) determination should expressly prohibit specification of waters of the United States, including wetlands, as discharge sites for dredged or fill material associated with metallic sulfide mines in these drainages.

If EPA concludes that the unavoidable impacts are unacceptable, regardless of whether or not they are amenable to compensatory mitigation, then EPA should invoke its authority under § 404(c) of the Clean Water Act to *expressly prohibit* designation of waters and wetlands as sites for discharge of dredged and fill material associated with metallic sulfide mines in the Kvichak and Nushagak drainages. This express prohibition would include prohibition of discharges of dredged and fill material necessary to construct dams and tailing facilities located upon such waters or wetlands. To do otherwise allows unacceptable impacts to occur and persist.

2. Likely impacts: The assessment implies various mitigation, prohibitions and restrictions.

a. Issues related to leaching of metals and acid-mine/acid-rock drainage.

If Pebble mine or similar mines are permitted in the Nushagak and Kvichak drainages, then a central issue will be how to design stipulations that are in addition to the express prohibition of the specification of waters and wetlands as sites for discharge of dredged and fill material associated with metallic sulfide mines in the Kvichak and Nushagak drainages. These additional stipulations would also have to protect fish habitat, water quality and quantity, and

[24] Appendix J, p. 16; see also pp. 11 – 16, discussing off-site and out-of-kind actions such as remediation of old mine sites, road removal, retrofitting road-stream crossings, fish stocking, hatcheries, commercial fish harvest reductions, and payments to conservation entities for public education, research and the like related to salmon sustainability. These do not comply with the requirements that compensatory mitigation be through a mitigation bank, an in-lieu fee program or by a permittee (40 CFR § 230.92) and should be in the same watershed as the impact site at a location most likely to successfully replace lost functions and services (40 CFR § 230.93(b)(1)).

other public values in perpetuity. These additional stipulations would take the form of prohibitions and restrictions in § 404(c) determination.

(1) Perpetual care.

Recommended Prohibition: As noted in the assessment, perpetual care has not been proven reliable,[25] and given the limited lifetimes of human institutions, continued monitoring and maintenance after closure of a metallic sulfide mine to control acid mine drainage and other contamination become increasingly unlikely as time from closure increases.[26] However, the Because of their importance for salmon, other fish and wildlife and public uses of fish and game, the Kvichak and Nushagak drainages, with substantial wetlands, are not the place to experiment with perpetual water treatment. Therefore, a § 404(c) determination should include an express prohibition of discharges that result in the need for perpetual water treatment. Perpetual treatment should be defined as open ended, where demonstrated and routinely used methods cannot predict the end of the need for treatment. Also, as noted above, perpetual care and maintenance would be needed for any artificial enhancements of aquatic systems for fishery productivity and should be included in a ban on facilities requiring perpetual care because they would be contrary to the requirement that compensatory mitigation be self-sustaining.

(2) "Non-acid-generating" waste rock.

Recommended Mitigation: Because non-acid-generating waste rock is what is left when acid-generating waste rock is separated out, the result is that inevitably some "non-acid-generating" waste rock, as noted in the assessment and the Waldrop report, will contain some acid-generating material. To mitigate, a liner and other protections will probably be necessary for the storage of the so-called "non-acid-generating" waste rock.

Recommended Restriction for a § 404(c) Determination: All waste rock dumps must be lined and have redundant water collection systems to ensure backup for collecting seepage to groundwater and runoff.

(3) "Potentially acid-generating" waste rock.

Recommended Mitigation: Process "potentially acid-generating" waste rock with ore so that none is stored on the surface for long term, as proposed in the assessment. Potentially acid-generating waste rock should be stored on a liner with redundant water collection systems while awaiting processing.

Recommended Restriction for a § 404(c) Determination: No long term storage of potentially acid-generating waste rock on site. The definition of long term should be based on the estimated time for acid generation from waste rock and the site and, given the uncertainty of methods used for predicting acid generation, should include a significantly protective margin of error.

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[25] See e.g., second draft of Assessment at p. 8-22.

[26] See e.g., second draft of Assessment at p. 4-19.

(4) Tailings.

Recommended Mitigation: liner with redundant water collection systems under tailings, water collection system down valley. Absent a liner, leachate would eventually flow through cracks in underlying bedrock and emerge at unknown locations. Pyritic tailings would eventually produce acid unless water was retained in the TSF, which will not be possible in perpetuity.

Recommended Restriction for a § 404(c) Determination: No storage of pyritic tailings, however, staging for shipping off site allowed.

(5) Pit walls and surface and groundwater from the pit.

Recommended Mitigation: Short term treatments of pit walls to prevent oxidation may be available, but no long term mitigation for acid generation and metals leaching is available. Long term quality of pit water is unknown. Water treatment may be the only means available to mitigate the adverse effects of poor water quality in a final pit lake. Water treatment must address both surface and groundwater to be effective. However, issues of perpetual treatment arise. So no sustainable mitigation is available for pit lake water quality issues.

Recommended Restrictions for a § 404(c) Determination: No mitigation is available. Significant adverse effects on downstream water is unacceptable, so a prohibition of mining is required to achieve the purposes of the Clean Water Act.

b. Issues related to tailings dams failure.

It is likely that, across the watersheds, multiple tailings dams must retain their integrity as engineered structures in perpetuity in the face of changing climate as well as repeated events of unusual, if infrequent, weather and earthquakes. The likelihood of a failure during operation is low due to the relatively short time frame and availability of maintenance and monitoring. In the long term, the several dams that will likely be in place will accumulate damage over the centuries that they will be in place. Logically, the likelihood of failure will increase, with catastrophic consequences.

Recommended Restriction for a § 404(c) Determination: Prohibit the storage of tailings in impoundments. No reactive material stored long term.

c. Waste water treatment failures.

Recommended Mitigation: (1) Redundant water treatment systems; (2) Shut the benefication mill and other sources of effluent down in the event of a bypass; and direct bypass to storage of sufficient capacity to store all bypass effluent in the system; (3) Best available technology.

Recommended Restriction for a § 404(c) Determination: Prohibition on mixing zones in anadromous waters.

d. Roads.

Recommended Mitigation: Effects of roads can be partially mitigated by ensuring that roads are not subject to fluvial and hydrologic processes at road crossings including flood plain processes.

Recommended Restrictions for a § 404(c) Determination:

Crossings of Anadromous Streams:

(a) No fill material may be placed in the flood plain of rivers and streams designated by the State of Alaska as important for the spawning, rearing or migration of anadromous fishes. Absent empirically defined flood plains the flood plain is defined as the area below the elevation of the plane across the stream valley at twice the thalweg depth[27].

(b) Bridge superstructures must be used to support the bridge in place of piers where practicable.

(c) Where superstructures have been demonstrated to be impracticable, bridges may be placed on piers. Multiple bridge piers may be placed in waters, but the minimum practicable number of piers must be used and each pier must occupy the minimum foot print necessary to, combined with all the piers on the same bridge, safely support the bridge structure.

Crossings of non-anadromous streams:

(a) Crossings of streams that do not provide spawning, rearing or migration habitat for anadromous fishes must be constructed according to methods described in the most recent version of the United States Department of Agriculture–Forest Service Stream Simulation: An Ecological Approach To Providing Passage for Aquatic Organisms at Road-Stream Crossings.

Wetland crossings:

(a) Roads crossing wetlands (as defined by the United States Army Corps of Engineers Wetland Delineation Manual and applicable supplements) must be constructed with porous road beds so that there is no ponding or visible impedance or diversion of flow of water due to the presence of the road fill prism.

Roadside ditches:

(a) Roadside ditches may not discharge to waters of the United States.

(b) Roadside ditches must have cross drainage such that water is not diverted along the axis of the road for more than 50 feet.

e. Pipelines.

Recommended Mitigation and Restriction in a § 404(c) Determination: Highest engineering and operations standards.

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[27] Thalweg depth is defined as the vertical distance from the deepest part of the stream channel to the elevation of the ordinary high water at the location of the road centerline or pipeline crossing.

3. Citizens' Alternative Bristol Bay Area Plan recommends similar prohibitions and restrictions.

The initial request of the six tribes and AIFMA that EPA commence a public process under Section 404(c) referred to litigation by the tribes, AIFMA and Trout Unlimited, Inc. in which they challenged the Bristol Bay Area Plan of the State of Alaska. That litigation has resulted in a new planning process and a "Citizens' Alternative Bristol Bay Area Plan."[28] For reasons similar to those discussed above, it also recommends that the State of Alaska adopt parallel requirements:

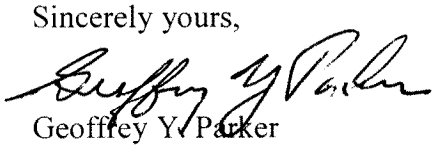
(1) that "[m]itigation must be within the drainage in which the mitigated events occur, not outside the drainage" (CABBAP, p. 25);
(2) that state "[p]ermits for discharge of dredged or fill material into anadromous waters and contiguous wetlands and waters shall not be issued for activities associated with development of a mine at a metallic sulfide deposit in the Kvichak and Nushagak drainages" (CABBAP, p. 55);
(3) that state "permits shall not be issued for a mine at a metallic sulfide deposit that places tailings impoundments in the Kvichak and Nushagak drainages" (CABBAP, p. 55), and
(4) that state "[p]ermits shall not be issued to develop mines at metallic sulfide deposits in the Kvichak and Nushagak drainages" (CABBAP, p. 56).

CONCLUSION

Appendix J on compensatory mitigation is the only portion of the assessment that discusses regulations and applies them to the facts. In that respect, Appendix J is incalculably superior to Attachment D of NDM's comments, which never once mentions the regulations and therefore is of marginal utility at best.

Because the regulations on compensatory mitigation are part of the § 404(b)(1) Guidelines which EPA uses to make determinations under § 404(c), Appendix J should be edited to make it more powerful. This may assist.

Sincerely yours,



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[28] See http://www.bristolbaylandtrust.org/wp-content/uploads/2013/05/BBAP_May_final.pdf.