

**Determining the least damaging practicable alternative for the proposed Pebble Project:  
Potentially less damaging practicable alternatives are improperly dismissed in the DEIS**

A Report Prepared for Earthworks  
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**Summary**

The Draft Environmental Impact Statement (DEIS) for the proposed Pebble mine project fails to adequately consider or disclose to the public a range of alternatives that may be capable of achieving the project purpose of mining copper and associated minerals practicably, and with far fewer impacts to wetland and aquatic areas than would result from the applicant's proposed project, or its inevitable expansion.

The DEIS improperly dismisses alternative ore deposits by setting an artificial geographic limit on alternatives far narrower than that used by the applicant in its own search for alternatives, and considers none of the many that the applicant considered before acquiring and focusing on the Pebble deposit. The DEIS also dismisses alternative copper porphyry deposits that have different secondary mineralization than the Pebble deposit, ignoring the fact that copper is the primary target that drove the applicant's own search for alternatives.

The DEIS dismisses alternative ore deposits that are insufficiently delineated in 2019, even though the applicant chose to spend nearly two decades delineating a deposit that, if constructed, would likely result in the greatest net losses of wetland and aquatic areas of any copper mine ever proposed in the United States. The DEIS should also have considered alternative copper deposits that have been available to the applicant when and since the time that it acquired rights to the Pebble deposit. The fact that the applicant chose not to apply for a permit until 2018 should not limit the search for alternatives to only those that are available now.

The DEIS makes no real assessment of on-site alternatives, and does not describe why the applicant's preferred alternative is the least environmentally damaging practicable alternative. The DEIS has no substantive discussion of the practicability of reconfiguring or relocating project components to reduce impacts to the aquatic ecosystem. As proposed, the direct, indirect, secondary, and temporary impacts of the project to wetland and aquatic areas are massive, and unprecedented for a copper mine in the United States.

Finally, the DEIS describes a project that appears unlikely to be ever constructed and subsequently closed as proposed. Rather, the impacts of the proposed project appear to be the

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first phase of a much larger project that would extend into additional watersheds with a project footprint that would dwarf the 20-year project that is described in the DEIS. Because the Corps cannot assure the public that the mine will, in fact, be closed and reclaimed as described in the DEIS, the DEIS remains woefully inadequate in describing the project's true long-term impacts and risks. Any proposed authorization of this project, as disclosed in the DEIS, should be found to be contrary to the National Environmental Policy Act and the Clean Water Act.

### **Background:**

The DEIS for the Pebble Project describes an alternatives development process<sup>2</sup> that sought public input on alternatives. The DEIS states that “*specific suggestions for alternatives that were provided by the public, stakeholders, and agencies during the scoping have been fully considered in the alternatives development process.*”<sup>3</sup> As with other areas in the DEIS for which scoping comments were submitted, there is no description of the content of such comments, no accounting of the number received, nor any discussion of how these comments were considered, accepted, or dismissed. As such, some of the comments herein repeat those that the author submitted in response to the Corps scoping requests,<sup>4</sup> inasmuch as there is no apparent evidence that these earlier comments were given any real consideration.

Also, as assessed in a separate report by this author,<sup>5</sup> the Corps has adopted an overly narrow definition of this project's basic and overall project purposes, effectively eliminating alternatives that should have been analyzed in the DEIS. These include copper porphyry deposits outside of the State of Alaska, as well as copper porphyry deposits within and outside of Alaska that are not presently known to contain economically recoverable concentrations of molybdenum. Properly, the Corps should have determined the basic project purpose to be hardrock mining, and the overall project purposes to be mining copper and associated minerals practicably. Instead, by choosing to artificially define the project as being limited to Alaska and to ore deposits with the same mineralization as the Pebble deposit, the Corps has more-or-less removed the applicant's burden of proof under the regulations to clearly demonstrate that there are no less environmentally damaging practicable alternatives than its proposed copper mine.

PLP has been proposing to mine for copper and other metals since at least 2004, and its parent company, Hunter Dickenson, for far longer. The regulations requiring the least-damaging practicable alternative have been required under Corps regulations since 1986, and the Corps is required to deny a permit application not only if PLP fails to clearly demonstrate the lack of a less-damaging option, but also if there is insufficient information for the Corps to formally determine that a project complies with the regulations.<sup>6</sup>

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<sup>2</sup> DEIS, Section 2.1 Alternatives Development Process, page 2-1

<sup>3</sup> DEIS, Section 2.1 Alternatives Development Process, page 2-2

<sup>4</sup> Yocom, T.G. 2018. U.S. Army Corps of Engineers, Alaska District, Public Notice POA-2017-271: Recommendations on the scope of analysis pursuant to the National Environmental Policy Act and Section 404 of the Clean Water Act. Report prepared for the Bristol Bay Native Corporation. June 17, 2018. 32 pages.

<sup>5</sup> Yocom, T.G. 2019. The Corps Determination of Basic and Overall Project Purposes Improperly Eliminates Consideration of Potentially Less Environmentally Damaging Practicable Alternatives. Report prepared for Earthworks. 12 pages.

<sup>6</sup> See Corps regulations at 33 CFR 323.6(a): “*The district engineer will review applications for permits for the discharge of dredged or fill material into waters of the United States in accordance with guidelines promulgated by*

Alternatives that were available to a permit applicant when it entered the market for its proposed project purpose(s) can be considered less-damaging practicable alternatives under the 404(b)(1) regulations, even if those alternatives are no longer available when PLP chooses to apply for a permit.<sup>7</sup> The court in *Bersani* explains the rationale for this requirement in detail:

*“the preamble to the 404(b)(1) guidelines states that the purpose of the “practicable alternatives” analysis is “to recognize the special value of wetlands and to avoid their unnecessary destruction, particularly where practicable alternatives were available in non-aquatic areas to achieve the basic purpose of the proposal.” 45 Fed.Reg. 85,338 (1980) (emphasis added). In other words, the purpose is to create an incentive for developers to avoid choosing wetlands when they could choose an alternative upland site. Pyramid’s reading of the regulations would thwart this purpose because it would remove the incentive for a developer to search for an alternative site at the time such an incentive is needed, i.e., at the time it is making the decision to select a particular site. If the practicable alternatives analysis were applied to the time of the application for a permit, the developer would have little incentive to search for alternatives, especially if it were confident that alternatives soon would disappear.”<sup>8</sup>*

PLP and/or its parent company have been fully aware of the 404 requirements well before it acquired the mineral rights to the Pebble deposit in 2001. And prior to that acquisition, as well as in the subsequent 17 or more years since the mineral rights were acquired, PLP has had ample opportunity to seek sites which it could mine for copper and other metals without the massive impacts to wetland and aquatic areas that it is proposing at the Pebble deposit. Indeed, even within the larger block of lands within which PLP holds the Pebble mineral rights, there are *“several porphyry copper as well as gold and polymetallic vein prospects.”<sup>9</sup>*

PLP has also known for well over a decade that its project would result in unprecedented losses of wetland and aquatic habitats, particularly those for which the Clean Water Act has established a special level of protection as special aquatic sites under the 404(b)(1) Guidelines. PLP should be required to clearly demonstrate that no other ore deposits for which copper and other metals could be extracted practicably have been available since PLP and its parent company, Hunter Dickenson sought to acquire the mineral rights to the Pebble deposit and surrounding block of lands. PLP should also be required to clearly demonstrate that there are no deposits within that block of lands where copper and other metals could be extracted with less adverse impacts to “waters of the United States,” including wetlands.

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*the Administrator, EPA, under authority of section 404(b)(1) of the CWA. (see 40 CFR Part 230.) Subject to consideration of any economic impact on navigation and anchorage pursuant to section 404(b)(2), a permit will be denied if the discharge that would be authorized by such a permit would not comply with the 404(b)(1) guidelines. If the district engineer determines that the proposed discharge would comply with the 404(b)(1) guidelines, he will grant the permit unless issuance would be contrary to the public interest.” (emphasis added) See also 40 CFR§230.12(a)(3)(i) and (iv): Discharges “(3) Specified as failing to comply with the requirements of these Guidelines where: (i) There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, so long as such alternative does not have other significant adverse environmental consequences; or (iv) There does not exist sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.”*

<sup>7</sup> See *Bersani v. Robichaud*, 850 F.2d 36 (2d Cir. 1988)

<sup>8</sup> *Bersani v. Robichaud*, 850 F.2d 36, 43-44 (2d Cir. 1988)

<sup>9</sup> <https://www.northerndynastyminerals.com/pebble-project/geology-and-exploration/>

PLP's parent company is also a Canadian firm, and it has shown that its search for such alternate deposits have not been limited to the Bristol Bay watershed, the State of Alaska, the lower 48 contiguous States of the United States, nor to its own home country, Canada. Hunter Dickenson operates worldwide, and there is nothing in the 404(b)(1) Guidelines that limit the search for alternatives to a single ore body, nor a single drainage or State. Clearly, PLP is part of a corporation that seeks to acquire rights to ore deposits worldwide and, as such, PLP should not be limited from considering less environmentally-damaging practicable alternatives well beyond the boundaries of the Pebble ore deposit or its surrounding block of claims.

The DEIS should consider other deposits where copper and other metals could be mined to be potentially less damaging alternatives, regardless of location, if they were available to PLP since it entered the market. This should include any deposits that have been, or could have been acquired, leased, or managed by PLP or its parent company, Hunter Dickenson. It may be noteworthy that PLP's previous partner, Anglo-American, after abandoning its shared ownership of the Pebble Deposit in 2013 (and over \$500 million in investment), has pursued other copper deposits successfully outside of Alaska and the United States.<sup>10</sup>

The applicant has made it clear that its proposed 20-year mine is only the first phase of future expansion, and its proposal to close the mine and fill the pit after only extracting about 10% of the known copper deposit seems unlikely at best.<sup>11</sup> If the Corps intends to continue to accept the applicant's artificially small 20-year mine to be genuine, then the range of practicable alternatives must be expanded to consider deposits that may have a similar lifespan or less, if otherwise practicable. In determining that practicability, the Corps must do a better job than it has in the DEIS of assessing the practicability of the applicant's proposal, including the costs of closure, compensatory mitigation, and long-term water quality maintenance.

Moreover, the Corps has chosen to define the basic and overall project purposes for this project so narrowly, and contrary to the applicant's own search for alternatives, that mining the Pebble deposit is the only site carried forward in the DEIS for analysis, other than the no action alternative. The Corps decision essentially removes the applicant's burden of proof to show that there is no less environmentally damaging way to mine copper than to destroy thousands of acres of wetland and aquatic areas.

The Corps' approach here conflicts own operating procedures. The Corps' 2009 Operating Procedures provide that "[t]he overall project purpose should be specific enough to define the applicant's needs, but not so restrictive as to constrain the range of alternatives that must be

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<sup>10</sup> <https://www.angloamerican.com/media/press-releases/2018/26-07-2018aa>

<sup>11</sup> Northern Dynasty Mines President Ron Thiessen's presentation on Jan 22, 2018 at the Vancouver Resource Investment Conference: "*Well, I don't know too many mines that start off at a scale and don't change over time. I mean, one of the things is, you know, today I can't stand up here and tell you after 20 years what will be the next mining method. Will it be open pit, will it be underground, will we want to expand the concentrator, will we want to put a gold circuit in. So, why would we attempt to permit something like that today when we couldn't answer the questions that the Army Corps of Engineers would be asking us about that. If we want to do those things, then we will have to permit those as and when we decide how we're going to go about it. So, it's only natural we permit what we see in the foreseeable future as an operation. At 160,000 tons a day, the resource that we have actually could last for 200 years.*" (emphases added. See: [https://www.youtube.com/watch?v=pBs1dnP\\_9eo](https://www.youtube.com/watch?v=pBs1dnP_9eo))

considered under the 404(b)(1) Guidelines.”<sup>12</sup> Limiting the range of alternatives to the State of Alaska is not based on the applicant’s needs. The DEIS makes this point clear, stating that limiting the range of alternatives to the State of Alaska was based on the public “*interest in improving the economy of the state, in the creation of jobs in the state, and in extraction of natural resources for the benefit of the state.*”<sup>13</sup> Whatever the merit of these propositions as a matter of public policy, they are not based on the applicant’s needs and only function to constrain the range of alternatives that must be considered under the 404(b)(1) Guidelines. Hence, this constraint directly conflicts with the Corps’ own operating procedures.

In addition, limiting the range of alternatives to orebodies that contain copper, molybdenum and gold is not based on the applicant’s needs. The applicant initially elected to lease this mining property with no information regarding the presence of commercially viable molybdenum deposits. Moreover, copper deposits are successfully mined worldwide regardless of the presence of commercially viable molybdenum or gold deposits. Requiring the presence of commercially viable molybdenum and gold deposits is not based on the applicant’s needs and materially restricts the range of alternatives considered under the 404(b)(1) Guidelines; including this constraint in the overall project purpose conflicts with the pertinent Corps operating procedures.

Similarly, the DEIS does not consider that the applicant chose to expend nearly two decades and many millions of dollars on a single copper porphyry deposit with such immense potential adverse environmental impacts, when it could have chosen to expend those resources on alternative deposits with less well-defined mineralogy but far less potential impacts to wetland and aquatic resources. As such, the DEIS dismisses alternative ore deposits that are insufficiently delineated in 2019, without considering whether they might actually be practicable alternatives, had the applicant expended its resources in developing other promising deposits. Clearly, PLP’s numerous previous partners found alternatives to pursue, and the applicant should be required to clearly demonstrate why it could not have, as well.

### **Alternatives described and dismissed inappropriately in the DEIS**

#### **1. Whistler Project (LOC-002; DEIS B-6)**

This alternative ore deposit was eliminated from further analysis “*because Whistler does not contain molybdenum.*”<sup>14</sup> This alternative should be evaluated further to determine if it is a less-damaging practicable alternative for mining copper and associated minerals.

#### **2. Pyramid Project (LOC-003; DEIS B-6 – B-7)**

This alternative ore deposit was eliminated because the deposit is not fully characterized. The DEIS states that it would be “*extremely expensive to conduct additional exploration*” to determine if mining the copper and associated minerals in the Pyramid deposit is practicable,

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<sup>12</sup> Department of the Army, *Updated Standard Operating Procedures for the U.S. Army Corps of Engineers*, July 1, 2009, p. 15.

<sup>13</sup> DEIS p. 1-4.

<sup>14</sup> DEIS, Appendix B, page B-6.

citing that the applicant has “*spent approximately \$700 million to date on exploration.*”<sup>15</sup> Whereas it is a bit misleading to state that the applicant has spent that much money (given that its previous partner, Anglo American spent the lion’s share of this total), these “sunk costs” are not relevant to whether another alternative is practicable to a typical applicant in the mining industry.<sup>16</sup> The question is whether the Pyramid Project would be a practicable alternative if the applicant had pursued it instead of the Pebble deposit, and spent a similar amount of time delineating the ore deposit before applying for a permit. It is inappropriate for the Corps to dismiss alternatives on the basis of either their availability or mineral characterization only after the applicant chooses to apply for a permit, rather than on the basis of when the applicant entered the market.

The location of the Pyramid deposit appears to be very close to navigable waters from which its ore could be transported to smelters overseas, eliminating the need for a long transportation corridor. It also appears to be in an area with far less extensive wetland and aquatic areas that would need to be permanently destroyed.

### 3. Outside of Alaska (LOC-004; DEIS B-7 – B-8)

Any alternative ore deposits outside of Alaska were dismissed as not meeting “*the USACE’s overall project purpose to develop and operate a mine in Alaska.*”<sup>17</sup> The applicant’s own search for alternatives extended to “the Americas,” and the Corps’ has improperly defined the project purpose and need far more narrowly than the industry that it is regulating.

Ore deposits outside of Alaska should be analyzed in the DEIS if the applicant could have acquired, leased, or managed them for extracting copper and associated minerals practicably. This should include deposits that were or have been available since the applicant entered the market in the late 1990’s, as well as those that have been practicable since the applicant acquired rights to the Pebble deposit and surrounding claims. Essentially any copper mining operation or copper porphyry deposit that has changed hands or added partners in the past 20 years, where copper is or could be mined practicably should be assessed.<sup>18</sup> To be practicable, an alternative that could be acquired, leased, or managed can be considered under the regulations.

### 4. Massive sulfide deposits in Alaska (LOC-005; DEIS B-8)

This alternative was eliminated from further analysis “*because these deposits do not contain molybdenum and do not meet the overall project purpose.*”<sup>19</sup> This alternative should be

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<sup>15</sup> DEIS, Appendix B, page B-6 – B-7.

<sup>16</sup> A project proponent assumes a certain risk in moving forward financially for a project that requires, but has not received, 404 authorization. This risk cannot be transferred to the costs of another site, nor can these “sunk costs” be used to justify a finding that another site is not practicable on the basis of costs. See page 294 in Yocom, T.G., R.L. Leidy, and C. Morris. 1989. Wetlands protection through impact avoidance: a discussion of the 404(b)(1) Alternatives Analysis. Wetlands. Volume 9, No. 2. Pages 283-296.

<sup>17</sup> DEIS, Appendix B, page B-7.

<sup>18</sup> Similar to PLP’s own search for partners for its Pebble Project, PLP has not been limited from seeking to become a partner on other copper mining projects with less adverse environmental impacts than its own proposal. This includes sites outside of the State of Alaska and outside of the United States.

<sup>19</sup> DEIS, Appendix B, page B-8.

evaluated further to determine if any of these deposits would constitute a less-damaging practicable alternative for mining copper and associated minerals. The applicant describes its project as “a copper mine,”<sup>20</sup> but the Corps is inappropriately dismissing alternatives on the basis of secondary mineralization of molybdenum.

#### 5. Pebble East (LOC-006; DEIS B-8 to B-9)

This alternative is dismissed because of potential environmental impacts that the DEIS considers to be more damaging environmentally than that applicant’s proposal. However, there is little question that the applicant, or its successor(s) in interest would expand the proposed mine to extract the copper and associated metals in the Pebble East formation. As such, the impacts of mining Pebble East will likely occur, and be additive to those predicted to occur with the proposed 20-year first phase. The DEIS should include analyses of the impacts of expansion in order to determine if the proposed project, when viewed as the first phase of a larger mine, is the least environmentally damaging alternative, or whether its redesign might result making the larger future mine less damaging overall.

The applicant has suggested that underground mining might be utilized in future expansion (see footnote 9, above). Accordingly, it seems inappropriate for the Corps to dismiss this alternative from further analysis and public disclosure in the DEIS.

#### 6. Single TSF with two cells (LAY-002; DEIS B-10 to B-11)

This was the original proposal in applicant’s December 2017 permit application, and should be carried forward for analysis in the DEIS. The DEIS finds that this alternative would have lower impacts to wetland and aquatic sites, but is eliminated from further consideration due to the needs for long-term maintenance and risks associated with a tailings dam failure. The wetlands acreages are not provided, but should be, given that the layout schematic (Figure B-2) appears to have considerably less impacts to wetland and aquatic areas.

This alternative should be evaluated further, particularly given the likelihood that the project (20-year mine with the mine pit being filled with waste rock and tailings at closure) will never be built and closed as proposed, given how little of the deposit will have been exploited. Accordingly, if the mine is, in fact, expected to expand well beyond its proposed boundaries, any less-damaging first phases should be carried forward in the DEIS for further analyses to determine how to minimize the overall impacts of the full-scale project.

#### 7. Single TSF with single cell (LAY-003; DEIS B-7 – B-7)

As with LAY-002, this alternative appears to have substantially fewer direct impacts to wetland and aquatic areas, although the relative acreages, again, are not provided in the DEIS. Potential water quality degradation and needs for long-term treatment are given as the rationale for

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<sup>20</sup> As recently as May 25, 2019, PLP made a presentation to the Alaska House Resources Committee, focusing on the importance of copper, and boldly stating as the first of its “Pebble Facts” that “*Pebble is a copper mine.*” See: [http://www.akleg.gov/basis/get\\_documents.asp?session=31&docid=23397](http://www.akleg.gov/basis/get_documents.asp?session=31&docid=23397)

dismissing this alternative as being more damaging environmentally, but this, too, presumes that the proposed project and immediate closure plan are genuine.

If, as repeatedly stated by representatives of the applicant, the mine is, in fact, expected to expand well beyond its proposed boundaries, less-damaging first phases should be carried forward in the DEIS for further analyses, given that such factors as water quality controls and leakage risks would most certainly extend decades longer as the mine expanded.

#### 8. EPA restricted mine sizes (LAY-004; DEIS B-12 – B-13 and LAY-005; DEIS B-13)

The DEIS dismisses alternatives within the range that EPA’s Bristol Bay Watershed Assessment considered that might fall within the thresholds of impacts that EPA considered to constitute significant degradation. LAY-004 is dismissed because EPA did not determine a particular layout to be “appropriate.” It would have been inappropriate for EPA to have done so, but it should not have prevented the Corps from considering if a practicable alternative could be constructed that would fall within EPA’s established thresholds.

In dismissing LAY-005, the Corps describes a project that is based upon the smallest mine size considered by EPA in its watershed assessment. No acreage figures are given with regard to the footprint, or the direct and indirect impacts to wetland and aquatic areas. Such figures should have been included. The Corps goes on to determine that the smaller mine would not have sufficient throughput to make the project economically feasible, stating that it would have a negative present value; however, the basis for this determination is not provided, nor is an economic assessment of the applicant’s proposed project, which may also be negative.<sup>21</sup>

#### 9. Larger mine (LAY-006; DEIS B-13 – B-14)

The DEIS recognizes that the project, as proposed, is likely to be expanded substantially in the future, but concludes that doing a thorough analysis of this expansion *exceeds the scope of the proposed project*. The Corps reaches this conclusion, even though representatives of the applicant have stated to investors that the mine will, in fact, expand over several additional decades (see footnote 11, above).

Rather than fully assessing and disclosing the near certainty that its authorization of the proposed project would enable a much larger and decades-longer project (with impacts far greater than the applicant’s proposal), the DEIS generally describes the areal extent of the project, provides a drawing of the potential layout, and includes a table comparing acreages of impacts between an expanded 78-year mine and the proposed 20-year mine.

The DEIS describes the direct impacts of the 20-year mine as including 3560 acres of direct impacts to wetland and aquatic areas, 1896 additional acres of indirect impacts that are considered permanent losses of habitat functions, and an additional 510 acres of impacts that would last for as long as one year (temporary impacts) – a total of 5966 acres. This does not

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<sup>21</sup> Borden, R.K. 2019. Pebble Mine Project Economics. Letter from Richard K. Borden to Shane McCoy, USACE, Alaska District. May 28, 2019. 7 pages.



include secondary impacts to wetland and aquatic areas on-site, downstream, or upstream of the project, and these could be significant.

The direct impacts for the 78-year project are not similarly broken down, but the sizes of the overall footprint of the various alternatives are given (DEIS Table 4.22-12, page 4.22-39). The DEIS Executive Summary states that “*the expanded footprint would increase the acres of wetlands and waters impacted by an estimated 12,445 acres,*”<sup>22</sup> but this is not discussed elsewhere in the document, and the author assumes herein that these impacts do not include indirect, secondary, or temporary impacts.

The applicant’s preferred alternative has a project footprint of 8,086 acres, not including the transportation corridor, and the 78-year project footprint is shown as 29,632 acres<sup>23</sup> (3.66 times greater than the applicant’s alternative). Using simple ratios to estimate the direct, indirect, and temporary impacts to wetland and aquatic areas, the applicant’s preferred project’s impacts of 5966 acres translates to potential impacts of over 21,000 acres of wetland and aquatic areas (34 square miles).

The Corps cannot treat this future expansion with such little regard, when there seems no real possibility that the Pebble Project would close down after extracting a small fraction of the recoverable ore in the Pebble deposit. The 78-year alternative should be carried forward and analyzed fully in the DEIS.

#### 10. Alternative transportation corridors (ACC-01 to ACC-26; DEIS B-35 to B-57)

The author has not evaluated the alternative transportation corridors, because they do not have comparable measures of wetland and aquatic impacts. The DEIS was hurried into development and release, rather than requiring the applicant to complete field studies to verify the reach and extent of the “waters of the United States,” including wetlands on all of the alternative routes. The Corps should also have required the applicant to update and reaffirm its outdated delineations of the mine site that were done in 2004 and 2007-2008. Furthermore, some commenters have raised questions about the availability of transportation corridors in Alternatives 2 and 3, which would pass through property owned by the Pedro Bay Corporation, which has not granted access.<sup>24</sup> If this is, in fact, the case, the Corps should revise the DEIS to reflect whether or not these alternative routes are available and practicable under the regulations.

The DEIS needs to assess whether a single transportation corridor would be sufficient to transport ore when the mine inevitably would expand. If so, the DEIS should fully evaluate the impacts of a 78-year (or longer) mine and determine if long-term impacts would be lessened by properly disclosing and planning for that larger alternative and its ore transportation needs.

As written, the DEIS does not provide the public with reliable and directly comparable quantification of impacts, and the DEIS should be revised with appropriate current data so the

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<sup>22</sup> See DEIS, Executive Summary, page 65.

<sup>23</sup> See DEIS, page 4.22-39.

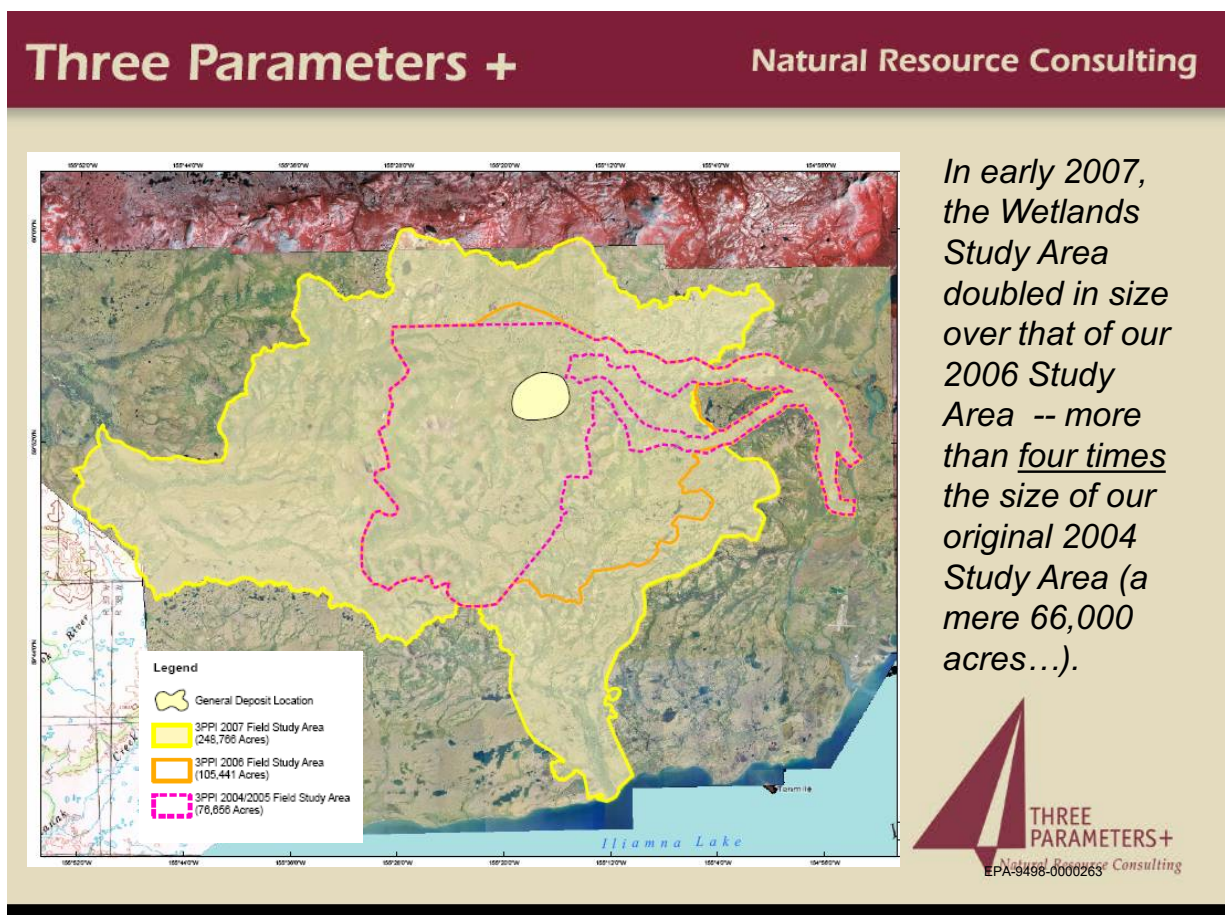
<sup>24</sup> See testimony of Barry Santana, P.E., PhD, DEIS, Public Hearing on Pebble Project DEIS, Anchorage, AK, April 16, 2019. 3 pages.

public and review and comment on the actual project impacts before the Corps moves to preparing a final EIS.

## 11. On-site reconfiguration

Table K2-1 gives acreage figures for each component of the overall project, but the wetland and aquatic impacts of each are not given, but should be.<sup>25</sup> The DEIS should describe why these project features cannot be resized, relocated, or reconfigured to reduce impacts to wetland and aquatic areas. The applicant has made numerous changes to its proposed project footprints over the past several years, as well as since submitting its permit application in December 2017. The applicant should clearly demonstrate that it cannot further reduce its impacts practicably.

In doing so, the DEIS should include expanded maps of wetland and aquatic areas that reflect the far more extensive delineations completed by the applicant beginning in 2004. The mapping included in the Corps' Preliminary Jurisdictional Determination (PJD) uses a "study boundary" that is far smaller than the areas that were mapped by PLP in its Environmental Baseline Documents (see figure below from a presentation made by one of PLP's consultants in 2007: <https://foiaonline.gov/foiaonline/api/request/downloadFile/EPA-9498-0000258-EPA-9498-0000296.pdf/2146f53e-4838-4b9e-97c0-b35fe6c7a408>).



<sup>25</sup> DEIS, Appendix K, Chapter 2, page K2-1.

Those wetland and aquatic site maps should be included in the DEIS in order to assess whether nearby areas that are outside of the PJD may include sites for project components that may be practicable alternatives that are less damaging environmentally.

## **Conclusions**

The DEIS dismisses alternatives that may in fact be practicable under the regulations and which would almost certainly be less environmentally damaging than the applicant's proposal. Inasmuch as there has likely never been a copper mine proposed in the United States with greater direct, indirect, and secondary impacts to wetland and aquatic areas, a determination that the Pebble Project is the least environmentally damaging alternative to achieve the basic project purpose should be an impossibility, but for the Corps' defining away alternatives that seem practicable to the industry it is regulating.

The DEIS is inadequate in disclosing the true range of alternatives that have been available to the applicant since it entered the market. The Corps should revise and reissue its DEIS to include copper porphyry deposits within and outside of the United States that could achieve the purpose mining copper and associated minerals practicably.