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VIA FOREST SERVICE COMMENT PORTAL AND EXPRESS MAIL

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re: Prince of Wales Landscape Level Analysis Draft Environmental Impact Statement

For nearly 50 years, the Southeast Alaska Conservation Council (SEACC) and its members have worked to protect the Tongass National Forest, the world's largest temperate rainforest. Inspired by the land, wildlife, cultures, and communities of Southeast Alaska, SEACC strives to ensure this interconnected whole exists for future generations. SEACC promotes conservation and advocates for sustainable human uses of the region's natural resources.

Since 1997, Alaska Community Action on Toxics (ACAT) is a statewide environmental health and justice organization established in 1997. ACAT is dedicated to protecting environmental health and achieving environmental justice. ACAT's mission is to assure justice by advocating for everyone's right to clean air, clean water, and toxic-free food. In 2014 and 2015, ACAT worked closely with Prince of Wales Island communities and residents to convince the Alaska Department of Transportation not to spray pesticides to control vegetation along rights of ways maintained by the State on Prince of Wales Island. See DEIS at 64.

Please accept the following comments from SEACC and ACAT on the Prince of Wales Landscape Level Analysis (POWLLA) Draft Environmental Impact Statement (DEIS). Both parties can be reached via the SEACC contact information indicated above in our letterhead and the signature block.

SEACC is also signing on to additional comments submitted by Earthjustice on behalf of SEACC and other groups. Those comments and accompanying materials are an integral part of SEACC's comments on the POWLLA DEIS.

Given the number and complexity of the issues presented in this landscape, it is simplest to start with what we like. First, we appreciate your decision to discard proposed Alternative 4. This alternative would have expanded logging into roadless areas and lands dropped from timber production in the 2016 Tongass Plan Amendment by the unanimous recommendation of the Tongass Advisory Committee (TAC). The TAC included representatives from the State of Alaska and the timber industry.

We appreciate consideration of Alternative 5, which reduces the rate and volume of old growth logging by 80% from the proposed action. This is the only alternative considered in the DEIS

that appears realistic, sustainable, and supportive of the big economic drivers in Southeast Alaska – its world-class fishing, recreation, and tourism sectors. The latest economic analysis available for all Southeast Alaska shows that in 2016 timber jobs represented under 1% of all employment and earnings in Southeast, while the tourism, commercial fishing, and seafood industries supported 21 percent of the region’s jobs and wages.¹

We support components of Alternative 5 that protect old-growth on the north end of POW Island above the 20 Road, between the communities of Point Baker and Port Protection and the western shoreline of Red Bay and Fish Pass, on south-facing slopes below 800-feet in elevation, and in VCU 5280 (Dry Pass south of Port Protection). We also appreciate the Forest Service’s commitment to not developing roads further on Tongass lands between Port Protection and Calder Bay. *See DEIS at 159-60.* This prescription is important to minimize impacts to subsistence deer hunting and enhance connectivity. We also support this alternative’s emphasis on uneven-aged management prescriptions, its implementation of broad protections for deer and wolf habitat recommended in the *2017 Interagency Wolf Habitat Management Program*, and efforts to improve wildlife habitat connectivity, particularly on previously clearcut lands. We strongly support that this alternative does not use herbicides to treat invasive plants. Given the legacy of “highgrading,” or the longstanding practice of concentrating logging on the most productive landscapes across all land ownerships within the project area,² we question whether even this reduced rate of old growth logging is sustainable.

We also applaud the agency’s efforts to integrate important job-creating restoration and sustainable recreation development into all the action alternatives. We are worried, however, by the apparent lack of agency commitment to replacing the 447 “red pipes” within the project area, which block access to over 90 miles of upstream fish habitat. *See DEIS, Table 4, Comparison of Action Alternatives at 35; see also 134.* While the Forest Service adds the caveat “as funding allows” to this important component of its action alternatives, it does not qualify its logging and roadbuilding plans similarly. Also missing from the DEIS is a discussion of how the Forest Service can take advantage of its best value contracting authority to maximize the ability of on-island contractors to obtain these restoration and development jobs.

I. Purpose and Need

We generally agree with the statement in the DEIS, at 7, of a need to integrate logging on Prince of Wales “with restoration opportunities in a sustainable manner that meets multiple economic, forest, and watershed objectives.” As noted in the DEIS, however, “[t]he forest products industry . . . is a shadow of its former self.” *See, supra* text accompanying note 1. Thus, instead

¹ Rain Coast Data for Southeast Conference, Southeast Alaska by the Numbers (2017). While not specific to Prince of Wales Island like the presentation in the record (AR 833_0594), the information presented in this report encompasses 2016, one additional year than reflected in AR 833_0594.

² The agency estimates the remaining old growth across the POWLLA project area identified in the Logging System Transportation Plan (LSTA) Logging averages 14 MMBF [sic] per acre. DEIS at 20; *but see* 2016 TLMP FEIS at 3-347 (“The average volume per acre is approximately 29 thousand board foot (MBF) per acre [forestwide].”). The highgrading legacy becomes even starker when compared to estimates in the recent Big Thorne Timber Sale on POW. The estimated average gross volume for all suitable old growth in the Big Thorne FEIS per acre was 39.97 MBF. *See* Forest Service, Big Thorne FEIS, R10_MB-736c, Table TBR-2 at 3-414.

of focusing on “maintain[ing] the expertise and infrastructure of the timber industry”, DEIS at 7, we recommend revising the purpose and need for POWLLA to supporting “appropriately-scaled wood products industries” on Prince of Wales Island.³

According to the DEIS, an alternative that did not log OG “was eliminated because timber volumes under this alternative would not sustain a local timber industry to meet the purpose and need of this project.” DEIS at 2-32. However, the purpose and need for the POWLLA “is to respond to the Forest Plan’s multiple-use goals and objectives, while moving the project area toward the desired conditions in that Plan (USDA Forest Service 2016a, p. 2-1).” DEIS at 1-5. None of the identified goals and objectives for Local and Regional Economies or Timber limit the purposes to sustaining a particular timber industry. Instead, the goals are exhortative: provide a diversity of opportunities for resource uses, and continue timber uses “on an even-flow, long-term sustained yield basis and in an economically efficient manner.” *Id.* at 5-6. Importantly, Congress intended the 1990 Tongass Timber Reform Act to end timber’s dominance in Tongass management and halt the Forest Service’s historical practice of elevating timber above all other forms of multiple uses. Consequently, an alternative that does not log old growth could meet this project’s purpose and need. The alternative SEACC requested the agency to consider during scoping would have precluded old-growth clearcut logging and limited future logging of old growth on the island to logging that emphasizes maintaining the productivity, structural complexity, and understory diversity in high-value winter range. *See AR 833-0066 (SEACC’s Dec. 2016 Scoping Comments).* Leaving old growth trees standing for recreation, tourism, fish, and wildlife habitat provides greater present day economic benefits than logging or road building.

II. Flawed Condition-based NEPA Process Applied for POWLLA Project.

According to the DEIS’ Abstract, the Forest Service hopes this National Environmental Policy Act (NEPA) process will “produce one decision to authorize integrated resource management actions on Prince of Wales over the next 15 years.” We understand the agency’s interest in efficiently using a single NEPA process to integrate the analysis of a wide array of site-specific timber, recreation, restoration, and transportation projects and management strategies. We find the process used by the agency to accomplish this purpose, however, confusing, uninformative, and potentially ineffective because it fails to follow existing agency policy, NEPA, or the Tongass Land Management Plan (TLMP). Worse, this approach means the agency did not disclose the information reasonably necessary for it to balance competing interests under the Multiple Use Act, National Forest Management Act, Section 810 of ANILCA, or Section 101 of the Tongass Timber Reform Act. *See Natural Resource Defense Council, 421 F.3d 797, 808-09 (9th Cir. 2005).*

³ We borrow this term from the [Landscape Strategy for the 4 Forest Restoration Initiative](#) (attached for the record) and it appears well suited to meeting TLMP’s Goal of “[p]rovid[ing] a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.”

a. Failure to Follow Gate System.

Instead of following national policy by implementing the Gate System,⁴ the agency jumped from Gate 1 (timber sale project plan) to Gate 2 (environmental analysis phase) before completing an initial field reconnaissance.⁵ Without completing a full Gate 1 inventory, the DEIS lacks the necessary data to inform the development of the silvicultural prescriptions and volume estimates needed to support a Gate 2 decision. The DEIS offers no explanation for not following existing agency policy for timber sale preparation, or fully explain its methodology for preparing and evaluating effects from proposed activities in the Gate 2 process. This violates NEPA. *See* 40 C.F.R. § 1502.24.

As a result, the Forest Service is now asking the public to review and comment on the effects of the proposed logging activities on the environment and their uses of Tongass lands, without providing detailed information as to “specific locations and methods.” Likewise, the Forest Service has conducted vulnerability assessments on only about a quarter of Tongass karst lands within the project area. Consequently, “[u]ntil the exact extent and location of any proposed action is determined, a determination of specific effects cannot be made.” DEIS at 228-29. Although the DEIS purports to disclose and evaluate the site-specific impacts of a range of possible activities, “the specific locations and methods [for authorized activities] will be determined during implementation,” after the Forest Supervisor selects an alternative and apparently without public involvement. DEIS at 1. Such an approach to planning violates NEPA. “General statements about ‘possible’ effects and ‘some risk’ do not constitute a ‘hard look’ absent a justification regarding why more definitive information could not be provided.” *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1380 (9th Cir. 1998).

b. Lack of Unit Cards Problematic.

Instead of providing the public with unit cards for all the proposed cutting units, the Forest Service prepared a [Commercial Vegetation Map](#), which apparently identifies all potential timber stands that could be logged under this project. *See* DEIS at 20. Interestingly, this map identifies Wilderness designations, but not the lands designated by Congress in 1990 and 2014 for Legislative LUD II status. The Forest Service must manage designated LUD II lands within the project area in a roadless state to retain their wildland character; this designation places these lands completely off limits to commercial logging. *See* 2016 Tongass Plan at 3-70. We request updates to these maps to reflect all Congressional designations on Prince of Wales and the surrounding islands.

The failure to include logging unit cards in the DEIS violates both NEPA and NFMA. First, postponing decisions about how approved “treatments can vary in magnitude and intensity to respond to resource conditions” until after a decision is made, violates NEPA. The POWLLA

⁴ *See* AR 833_0147 (attachments to SEACC’s Scoping Comments on Corrected NOI (883-0146)(specifically WO-Forest Management Activity Review, Alaska Region, June 12-20, 2016 06282016 at 9-10).

⁵ *See* AR 833_1342 at 2 (“It is increasingly apparent that a full Gate 1 analysis of the island-wide project acres following the existing protocol cannot be completed in time to provide this data.”)

DEIS violates NEPA by failing to consider closely related actions that are connected, cumulative, or similar in the same EIS. *See* 40 C.F.R. 1508.25(a). Secondly, the failure to provide detailed unit cards for any of the proposed cutting units violates NFMA because the decision is inconsistent with the 2016 TLMP's forest-wide standard TIM3.I.C.

c. Failure to Comply with TLMP Standards.

Finally, this NEPA analysis and the proposed implementation process violates NFMA because the Forest Service is not following specific standards applicable to timber under the 2016 TLMP. When specifying the resource-specific guidelines applicable for clearcutting old growth (Activity Card 13, Appendix A-74), the DEIS notes that “[t]he 2016 Forest Plan (pages 4-68 to 4-69) requires a number of considerations/ determinations before this activity can be applied.” No mention is made of the commands contained in other applicable forest-wide standards, or an explanation offered for not doing so. These “other” forest-wide standards at p.4-67 include:

TIM2.I.B. Conduct silvicultural examinations and develop silvicultural prescriptions for proposed resource management activities where vegetative manipulation of the Forest is involved. (Consult Region 10 Silvicultural Examination and Prescription Handbook - 2409.26d).

C. Conduct silvicultural examinations as part of timber sale analysis. Silvicultural examination is the process of gathering vegetative data to provide a basis for silvicultural and other management decisions.

D. Develop silvicultural prescriptions to be approved by a R10 certified silviculturist as part of project planning. Complete all prescriptions before project implementation where implementation is defined as either the Final Record of Decision, Environmental Assessment Decision Notice, or Decision Memo. Base silvicultural prescriptions on silvicultural examinations; include a written description of the current stand conditions, the anticipated future condition based on management activities, and a statement on land management and resource objectives. The prescription should also include silvicultural practices, cutting methods, or other management actions that will be applied sequentially to achieve the desired stand condition and structural attributes. A silvicultural analysis for project planning should address both stand and landscape conditions.

...

TIM3.I.C. Consider the management prescription of the LUDs within the project area in project design and environmental analysis for timber activities. Timber harvest unit cards will document resource concerns and protection measures. The unit cards, including a map with relevant resource features, will be provided electronically when Draft or Final NEPA documents and decisions are published. (Consult Tongass National Forest Supplement 1909.15-2015-1.)

d. Connected Actions Not Evaluated in a Timely Mannerthe .

The analysis of existing and proposed “log dumps” (euphemistically called Log Transfer Facilities in the DEIS) provides another example of the Forest Service failing to use the POWLLA DEIS to analyze temporarily or spatially connected actions as required by NEPA. The DEIS explains that “[t]hirteen existing [log dumps] are proposed for use and two new sites are proposed for all alternatives.” DEIS at 314. While Appendix G of the 2016 Tongass Plan provides programmatic guidance for siting and development of log dumps, the DEIS provides no site-specific data for the public to evaluate and comment on the impacts of projected site development on water quality or their existing uses of these waters.

Since the new sites will require a Section 404 permit, the DEIS should have included a site-specific review of practicable alternatives, such as barging instead of dumping the logs directly into Alaska’s productive marine waters. By not including an analysis of subsequent connected actions in the DEIS, the Forest Service cannot demonstrate compliance with the Section 404(b)(1) Guidelines as required by the Clean Water Act. Likewise, when the State of Alaska considers whether to allow an operator to lower high water quality under the Alaska Pollutant Discharge Elimination System (APDES), it must determine whether “such a lowering is necessary to accommodate important economic or social development in the area where the waters are located.” *See* 40 C.F.R. § 131.12(a)(2)(ii) (2015). NEPA does not allow the agency to defer particular environmental review and consultation requirements relating to subsequent connected actions, like Section 404 or 402 permits for new log dumps as required by the Clean Water Act. The Forest Service should have analyzed a practicable range of alternatives (e.g., barging) for each site in the POWLLA DEIS or explained the framework and scope for subsequent tiered analysis associated with authorizing new log dumps.

III. DEIS Fails to Confront Effect of Anticipated Project Falldown.

Given the proposed action’s emphasis on community resiliency and economic development on Prince of Wales Island, SEACC identified “falldown” as a significant issue for designing, comparing, and evaluating potential action alternatives. *See* AR 833-1238 at 6. Falldown refers to the consistent pattern of data and experience on the Tongass that reveals a predictable shortfall at the project implementation of acres and volume from levels approved in project decisions. Falldown is a significant issue because of its effect on a timber sale’s touted economic benefits. Moreover, NEPA requires the Forest Service to inform the public about “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity.” 40 C.F.R. 1502.16 (2015). Although falldown occurs at both the Forest Plan and project levels, the Forest Service has only attempted to address this issue by adjusting modeling constraints at the Forest Plan level; it has never accounted for, and evaluated the effects from, additional falldown during project implementation. SEACC submits documents excerpted from the Forest Service’s response to SEACC’s Change Analysis FOIA (2011-TNF-029) and related to logging on Prince of Wales for incorporation into the POWLLA Administrative Record.

In response to the Corrected Notice of Intent issued for this project, SEACC submitted information on project-level falldown. *See* AR 833_0146. Specifically, information disclosed in a 2017 Memo to Chief Tidwell from the Acting Regional Forester about a 12 million board foot (MMBF) falldown from the 97.7 MMBF appraised and sold in the Big Thorne sale, and an earlier review by the Washington Office of the Forest Service’s Tongass timber program (hereinafter “WO Forest Management Activity Review”) in 2016. *See* 833_0147 (attachments to SEACC’s comments on Corrected NOI). Together, the falldown identified by the Acting Regional Forester exacerbates the effects from the agency not using the most recent cost and selling value information available when it appraises a sale, and Viking Lumber’s practice of cherry-picking the most valuable trees. *See* AR 833-0147, WO Forest Management Activity Review at 10, 13, 17-18. Not only does the DEIS completely ignore the falldown issue, but neither the May 31, 2017 Memo from Acting Regional Forester Nourse to Chief Tidwell nor the Washington Office’s Tongass Timber Review is disclosed or evaluated in the DEIS.

The so-called “condition-based NEPA process” employed for this project analysis will only exacerbate project falldown during implementation of timber offerings because the agency chose not to complete a full Gate 1 analysis before proceeding to Gate 2. Although the agency has traditionally collected and displayed data by Value Comparison Unit (VCU), the POWLLA project subdivided the project area into 18 Timber Analysis Areas (TAA) and then applied “[a] reduction of 50 percent . . . to the gross acreage from the LSTA stands to estimate un-inventoried old-growth potential harvest stands.” DEIS at 92, 94. As a result, [u]ntil the actual units for a timber sale offering (selected from the LSTA) are defined, located, and field-reviewed, reductions in acreage and volume cannot be accurately quantified.” *Id.* at 3-94. The agency also explains, “[r]esource concerns and mitigation measures may be refined further by specialists after specific activity locations and details are identified, and documented through the implementation plan process.” DEIS at 32.

Altogether, the failure to disclose and evaluate the degree to which falldown will predictably occur during implementation of any logging approved for POWLLA, and the resulting environmental, social and economic impacts of that falldown, violates NEPA. Clearly, project falldown is a significant factor affecting the economics of Tongass timber sales and the agency’s ability to provide a sustainable supply of economic timber to local industry. Factors, such as project falldown, which directly affect both supply and economics, need to be considered by the agency. The Forest Service’s failure to do so in the DEIS makes the agency effort to use this NEPA process to offer a stable supply of economically viable timber sales from the POWLLA project to local operators arbitrary. Consequently, the analysis in the DEIS fails to foster informed decision making and public participation. We request the Forest Service supplement the analysis in the DEIS to account for the consistent pattern of data and experience which shows that falldown greater than the amount accounted for during forest planning will occur during project implementation – particularly within the POWLLA project area.

IV. Invasive Plant Management Analysis Flawed and Incomplete.

The DEIS’s review of the environmental consequences of Invasive Plant Management is flawed and incomplete with respect to the full scope of potential impacts from the use of pesticides.

Because of staunch opposition from residents of Prince of Wales Island communities, “[t]he Alaska Department of Transportation is not currently using herbicides for vegetation management along the roads on Prince of Wales Island that they maintain.” DEIS at 64. Both the proposed action and Alternative 5 call for using only manual and mechanical treatment methods to eradicate and control existing or new infestations of invasive species. The DEIS, however, lacks a thorough analysis of non-chemical control measures, including manual, mechanical, and biological controls. While we appreciate the fact that none of the alternatives allow for aerial spraying of pesticides, Alternative 3 does allow application of pesticides by broadcast spray, spot spray, and hand-selective methods. *See* DEIS at 60, note 5. Given the option for using chemical methods under Alternative 3, and the particularly high solubility of karst landscapes on Prince of Wales and surrounding islands, we submit additional information for incorporation into the record.

Both the supporting analysis and DEIS conclude, “effects of the proposed herbicide applications on the soil resource are expected to be negligible over the POWLLA project area.” AR 833_1072 at 9; DEIS at 69 (“While herbicide use in Alternative 3 does carry a greater risk of effects to human health than Alternatives 1, 2, or 5, it provides an effective form of treatment for many weed populations.”). According to cited analysis, but absent from the DEIS, we learned that “[a] small amount of invasive plants are located in karst lands (Table 1). Most of these are along the road corridor or in young-growth stands; very few infestations are in undisturbed areas. Some of the infestations occur on high vulnerability karst. These areas have high density of karst features and are conduits to a subsurface hydrologic system.”⁶

Figures in the DEIS indicate that nearly 17 percent of Tongass National Forest lands within the project area are classified as karst lands. *See* DEIS at 1 and Table 53 at 223-24. The discussion in the DEIS and background materials, however, lacks any analysis about the subsurface movement of pesticides or their retention and degradation in groundwater systems.

Over 10 years ago, SEACC led the grassroots opposition to Klukwan Inc.’s effort to obtain a permit to spray aerially Imazapyr, Glyphosate and adjuvants on private lands on Long Island. To assist our review of the permit, SEACC hired Thomas J. Aley, President of Ozark Underground Laboratory in Missouri. Mr. Aley is a licensed professional geologist in the states of Arkansas, Kentucky, and Alabama, and a Registered Geologist in the state of Missouri. Since 1973, the bulk of Mr. Aley’s work has dealt with the subsurface movement of water and contaminants in karst landscapes, including a number of groundwater tracing investigations on Prince of Wales, Tuxekan, Heceta, Kosciusko, and Chichagof Islands in Southeast Alaska. Mr. Aley participated in the initial development of karst vulnerability standards for the Tongass National Forest, as well as a 2002 review of the standards and their implementation.

Mr. Aley identified a series of inadequacies in a study performed for Klukwan, Inc., and explained in detail why several of the assertions related to pesticide transport in and to groundwater were inaccurate. Mr. Aley described the karst assessment conducted for Klukwan,

⁶ AR 833_1072 at 5 (Foss, J. 2018. Invasive Plant Management Project for Prince of Wales Landscape Level Analysis Soil and Wetlands Report. Internal document).

Inc. as “extremely superficial” and identified several ways in which the survey could have been improved. Mr. Aley also concluded that the study’s observations “are inconsistent with O’Donnell’s conclusion that the karst groundwater system will not be significantly impacted by the proposed herbicide application.” For the record, we attach Mr. Aley’s June 28, 2005 Report on Anticipated Impacts of Aerially Applied herbicide on Karst Areas on Long Island, Alaska (June 28, 2005)(with exhibits). While we understand that the Forest Service is not proposing to aerial spray under any of the alternatives, Mr. Aley’s conclusions are still relevant when assessing the effects of using herbicides on karst terrain. As noted in the DEIS, “[t]racer dye studies have shown that some downstream effects may be as much as a mile away within a 24-hour period, often at spring-fed anadromous streams (Prussian and Baichtal, 2007).” DEIS at 227. The DEIS further explains, “Dye tracing studies have allowed us to understand some of the subsurface flow paths, but many resurgence locations, resurgence locations, and their connectivity are still unknown.” DEIS at 49.

For the record, we also submit the Report of Warren P. Porter, Ph.D., a professor of zoology and a professor of environmental toxicity at University of Wisconsin. SEACC hired Dr. Porter because of his expertise in toxicology and exploration of the synergistic effects of multiple contaminants and other variables on biological processes. After reviewing the decision authorizing aerial spraying of pesticides on Long Island, he concluded the Department of Environmental Conservation’s conclusion there was “no unreasonable adverse effects” was implausible because scientific literature has documented that:

1. Pesticides have a long residence time in soils at northern latitudes;
2. EPA risk estimates under-estimate low concentration effects by factors up to 10,000 times;
3. EPA fails to require that studies be done on alteration of gene expression by these agents which [sic] have been shown to alter gene expression in animals and human material. This altered gene expression can result in higher estrogen levels that can alter sexual development, promote certain types of cancer, and have other consequences;
4. There are no neurological, endocrine, or immune studies of the glyphosate-imazapyr pesticides and Competitor and other surfactants and nonionic solvents which DEC has permitted;
5. Combinations of active ingredients and other ingredients that include nonionic (no electrostatic charges) solvents and surfactants (such as Competitor) can cause enhanced effects, yet DEC failed to evaluate such studies;
6. The surfactants and nonionic solvents in pesticide formulations tend to reduce surface tension, an important factor in soil binding. As a result, the probability of leaching into the karst groundwater system, and ultimately marine water, is enhanced. The long lifetimes in soil should be even longer in water, where temperatures are lower. These are important aspects of the problem that DEC failed to consider. Thus, DEC's explanation of mobility of these pesticides runs counter to the evidence. **Because of a months-long lifetime of glyphosate, and a calculated 5.9 year half-life of imazapyr in water, in aerobic soil, and a 'moderate leaching**

potential' (Serafini, 2003), it is more likely than not that they will be harmful at levels that will reach the ground or water [emphasis in original]

See Report of Warren P. Porter, Ph.D. at 3 (June 30, 2005)(emphasis in original).

General statement about risks and threshold of concerns are unsatisfactory primarily because of many flaws in the way pesticides are registered and the fact that pesticides often contain inert ingredients, which are unidentified and untested. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) regulates the registration, sale, and use of pesticides. The Environmental Protection Agency (EPA) administers the FIFRA. Due to inherent flaws, lack of rigor, and weaknesses of the federal law, it is not accurate to assume that FIFRA provides adequate protection for the environment and public health:

- Toxicity studies required for pesticide registration do not include health-related endpoints such as neurodevelopmental deficits, endocrine disruption, immune system effects, or chronic diseases such as Parkinson's disease. However, these disease outcomes have been linked with pesticide exposures in the peer-reviewed scientific literature.
- Most pesticide products are given approval through 'conditional registration' before all required toxicity studies are completed. Pesticides can remain on the market while the testing and review may not be completed for years, if at all, and with little public oversight. Under FIFRA, pesticides are reviewed only every 15 years, leaving a long gap between advancements in scientific understanding and regulatory actions.
- Exposure limits are generally based on data provided by the pesticide manufacturers that have not been peer reviewed, rather than on independent research studies that have been published in respected peer-reviewed, and publicly accessible scientific journals. Peer-reviewed science may indicate the need for more protective limits, yet pesticide regulations and labels are "stuck in time."
- The pesticide registration process does not require that EPA consider safer alternatives or lower use/exposure levels. The primary incentive for an industry registrant is to acquire approval for the uses of their product rather than assessment of reduced risk or safer alternatives.
- Scientific understanding about the health effects of pesticides have led to restrictions or cancellation of registrations, although these actions come after decades of harmful use.
- Combinations of pesticide active ingredients are not tested for synergistic or additive effects. Despite the fact that "inert" ingredients may make up more than 90% of a pesticide formulation, EPA does not require disclosure or evaluate the toxicity of inert ingredients. In fact, designation as "inert" is arbitrary given that an inert ingredient, according to the EPA, "may have biological activity of its own, it may be toxic to humans, and it may be chemically active." In the preeminent peer-reviewed environmental health journal published by the National Institute for Environmental Health Sciences, *Environmental Health Perspectives*,⁷ the authors warn:

⁷ Cox C, Srgan M. Unidentified Inert Ingredients in Pesticides: Implications for Human and Environmental Health. *Environmental Health Perspectives* 2006;114(12):1803-1806

Inert ingredients may be biologically or chemically active and are labeled inert only because of their function in the formulated product ... Inert ingredients can increase the ability of pesticide formulations to affect significant toxicological endpoints, including developmental neurotoxicity, genotoxicity, and disruption of hormone function. They can also increase exposure by increasing dermal absorption, decreasing the efficacy of protective clothing, and increasing environmental mobility and persistence. Inert ingredients can increase the phytotoxicity of pesticide formulations, as well as toxicity to fish, amphibians, and microorganisms.

We find the DEIS analysis of direct, indirect, and cumulative effects of the pesticides inadequate and fundamentally flawed. The DEIS indicates (p 59) that the analysis is based, at least in part, on “formal risk assessments” done by Syracuse Environmental Research Associates (SERA), Inc. The credentials of SERA are unverifiable because the DEIS does not identify the company’s principals or qualifications. In fact, there seems to be no legitimate web site, curriculum vitae, academic qualifications, or peer-reviewed publications available for the company or its principals. The “formal risk assessments” are not in the POWLLA Administrative Record, so it is impossible to evaluate their veracity. The failure to identify and make explicit scientific resources relied upon for conclusions in the DEIS violates NEPA. *See* 40 C.F.R. § 1502.24.

The assumption of low toxicity of the proposed herbicides is based on outdated information. There is evidence of genotoxicity and teratogenic effects of glyphosate in animal studies at low doses. A review paper published in the journal *Science of the Total Environment* in March 2018 concluded that: 1) glyphosate and its degradation product AMPA have accumulated in the environment; 2) chronic low dose effects on animals and humans have been documented recently; 3) shifts in microbial community composition in soil, plants and animal guts resulted; 4) glyphosate and antibiotic resistance have arisen in fungi and bacteria in parallel; 5) glyphosate may serve as one of the drivers for antibiotic resistance.⁸ Exposures to glyphosate alone or glyphosate formulations *in utero* are linked to birth defects and fetal loss in chickens, frogs, and mammals.^{9, 10, 11} Low dose exposures are associated with fetal toxicity risks including such effects as dilated hearts and visceral anomalies (in rats) and post-implantation and late embryonic deaths (in rabbits).¹² Glyphosate “disrupts important pathways in development, such as retinoic acid signaling and estrogen biosynthesis.”¹³ Further, glyphosate has been reported to disrupt enzymatic pathways, such as the cytochrome P450, and to damage DNA structure in

⁸ Van Bruggen et al. 2018. Environmental and health effects of the herbicide glyphosate. *Science of the Total Environment* V 616-617: pp 255-268.

⁹ Parvez et al. 2018. Glyphosate exposure in pregnancy and shortened gestational length. *Environmental Health* (hereinafter “Parvez et al. 2018”).

¹⁰ Antoniou M, et al. 2012. Teratogenic effects of glyphosate-based herbicides: divergence of regulatory decisions from scientific evidence. *J Environ Anal Toxicol.* S4(006):1–13.

Dallegrave E. 2003. Teratogenic potential of the herbicide glyphosate-roundup in Wistar rats. *Toxicol Lett.* 142(1–2):45–52.

¹² Parvez et al. 2018.

¹³ Paganelli A, et al. 2010. Glyphosate – based herbicides produce teratogenic effects on vertebrates by impairing retinoic acid signaling. *Chem Res Toxicol.* 23(10):1586–95.

human breast epithelial and placental cells.”^{14, 15, 16, 17} Glyphosate also inhibits aromatase (CYP19A1) activity by a direct interaction with the active site of the enzyme at concentrations 100 times lower than regulatory standards.¹⁸ Glyphosate “induced DNA damage and chromosomal breaks *in vitro* and *in vivo* in mice.”¹⁹ A 2015 paper concluded that glyphosate-based herbicides “cause teratogenic, tumorigenic, and hepatorenal effects” at levels within “acceptable” regulatory levels.²⁰ Glyphosate has been shown to induce the growth of human breast cancer cells via estrogen receptors—“glyphosate at 10^{-12} to 10^{-6} M promoted growth of T47D cells via estrogen receptors.” The results of this study demonstrated that “low and environmentally relevant concentrations of glyphosate possessed estrogenic activity.”²¹ The determination by the International Agency for Research on Cancer (IARC) that there is “sufficient evidence of carcinogenicity in experimental organisms to classify glyphosate as “probably carcinogenic to humans” stands as a definitive determination that should not be dismissed as it is in the DEIS. IARC monographs are prepared by internationally renowned and independent experts. There are questions about the veracity of the EPA evaluation of carcinogenicity and investigation of possible collusion with the chemical manufacturer Monsanto.

Glyphosate is persistent in soils after application, especially in northern regions. In a Finnish study, the measured half-life of glyphosate was 249 days.²² In Ontario, Canada, glyphosate had a half-life in forest soils of 24 days with detectable residues persisting for 335 days.²³ On three British Columbia forestry sites, glyphosate persisted 360 days.²⁴ In a Swedish study, glyphosate persisted from one to three years on eleven forestry sites.²⁵ Another peer-reviewed study reported that glyphosate has a half-life of 3 days to 25 weeks in soil and 1 day to 25 weeks in water with a pH of 7. The herbicide has the potential of eliminating a wide variety of plants

¹⁴ Parvez et al. 2018.

¹⁵ Richard S, et al. 2005. Differential effects of glyphosate and roundup on human placental cells and aromatase. Environ Health Perspect. 2005; 113(6):716–20 (hereinafter “Richard S. et al. 2005).

¹⁶ Gasnier C, 2009. Glyphosate-based herbicides are toxic and endocrine disruptors in human cell lines. Toxicology. 262:184–91.

¹⁷ Benachour N, et al. 2007. Time and dose-dependent effects of roundup on human embryonic and placental cells. Arch Environ Contam Toxicol. 53(1):126–33.

¹⁸ Richard S, et al. 2005.

¹⁹ Claudia Bolognesi SB, et al. 1997. Genotoxic activity of glyphosate and its technical formulation roundup. J Agric Food Chem. 45(5):1957–62.

²⁰ Mesnage, R. et al. 2015. Potential toxic effects of glyphosate and its commercial formulations below regulatory limits. Food and Chemical Toxicology 84:133-153.

²¹ Thongprakaisang, S. et al. 2013. Glyphosate induces human breast cancer cells growth via estrogen receptors. Food and Chemical Toxicology 59: 129-136.

²² Muller, M.M. et. al. 1981. Fate of glyphosate and its influence on nitrogen cycling in two Finnish agricultural soils. Bull. Environ. Contam. Toxicol. 27:724-730.

²³ Feng, J.C. and D.G. Thompson. 1990. Fate of glyphosate in a Canadian forest watershed. J. Agric. Food Chem. 38:1118-1125.

²⁴ Roy, D.N. et.al. 1989. Persistence, movement, and degradation of glyphosate in selected Canadian boreal forest soils. J. Agric. Food Chem. 37:437-440.

²⁵ Torstensson, N.T.L., L.N. Lundgren, and J. Stenstrom. 1989. Influence of climate and edaphic factors on persistence of glyphosate and 2,4-D in forest soils. Ecotoxicol. Environ. Safety 18:230-239.

including desirable as well as “undesirable” vegetation, grasses and many broad leaf species. The main breakdown products of glyphosate are aminomethylphosphonic acid (AMPA).²⁶ Another reported degradation product of glyphosate is formaldehyde,²⁷ a known carcinogen. In a study of glyphosate degradation in Willapa Bay in Washington State, glyphosate concentrations in the estuarine mudflats took 119 days to decline to 72%, while AMPA did not degrade during that period.²⁸ Other studies show that the half-life for glyphosate in water ranges from 35-65 days. “In British Columbia, following application of glyphosate using a no-spray buffer and very low concentrations of glyphosate, the breakdown product AMPA was sometimes observed in water and sediment of streams after the first heavy rain following application.”²⁹ Another study of agricultural watersheds shows similar results, with the highest concentrations in runoff one to ten days, and detection up to 4 months after application.³⁰ Higher peak concentrations were observed in water following heavy rain events up to three weeks after application and “sediment peaks were observed later and persisted in stream sediments for more than one year.”³¹ A fact sheet about glyphosate from the Oregon State University Environmental Toxicology and Chemistry Program recommends no berry or mushroom consumption from newly-treated areas.³² Although there are fewer studies concerning the environmental and health effects of imazapyr and aminopyralid, the DEIS has not presented sufficient evidence to justify a determination of “low toxicity” nor to justify their use.

Herbicides cause “trophic cascades” including direct and indirect harmful effects on many species, including aquatic invertebrates that are food sources for salmonids and other fish.³³ In general, herbicides and other pesticides have long residence times in soils and waters at northern latitudes. Product formulations of active ingredients and proprietary, undisclosed additives such as solvents and surfactants can cause enhanced adverse effects to the environment and human health. Interactive and low-level effects at concentrations below EPA allowable levels have been found to cause profound impacts on neurological, endocrine, immune, and developmental processes including the development and function of the brain, as well as reproductive health. We are concerned about the potential effects on subsistence users, children, and other vulnerable populations (e.g. pregnant women, people with chronic illnesses, and elders).

The use of herbicides presents an unnecessary risk to environmental and human health. The DEIS fails to fully evaluate the use of non-chemical alternatives. The cost analyses used to

²⁶ 833-1109 (Norris, L.A., H.W. Lorz, and S.V. Gregory. 1991).

²⁷ McInnis, R.R. 2003. Biological Opinion of the NOAA National Marine Fisheries Service SWR-01-SA-6117:JSS.

²⁸ Simenstad, C.A. et.al. 1996. Use of Rodeo and X-77 Spreader to control smooth cordgrass in a southwestern Washington estuary. Environ. Toxicol. Chem. 15(6):969-978.

²⁹ U.S. Forest Service. 2000. Glyphosate: Herbicide Information Profile. Pacific Northwest Region. November 17, 2000. 25 pp.

³⁰ Norris, L.A., H.W. Lorz, and S.V. Gregory. 1991. Forest chemicals: In: Influences of forest and rangeland management on salmonid fishes and their habitats. W.R. Meehan, ed. American Fisheries Society Special Publication 19:207-296.

³¹ U.S. Forest Service. 2000. Glyphosate: Herbicide Information Profile. Pacific Northwest Region. November 17, 2000. 25 pp.

³² OSU Pesticide Fact Sheet: Forestry Use, Glyphosate (compiled Dec. 1996; updated Nov. 2002).

³³ Diana, S.G., W.J. Resetartis, Jr., D.J. Shaeffer, K.B. Beckman, and V.R. Beasley. 2000. Effects of atrazine on amphibian growth and survival in artificial aquatic communities. Environ. Toxicol. and Chem. 19:2961-2967.

justify the use of herbicides are based on biased assumptions and fail to incorporate considerations of externalized costs, including harm to human health and the environment.

V. Failure to Disclose and Incorporate 2018 IRT Recommendations Violates NEPA & TLMP.

Although the DEIS explains that concerns with the Interagency Review Team (IRT) as to landscape level connectivity on Prince of Wales Island “were either: 1) addressed and fixed, or 2) in some situations . . . acknowledged [but] could not be rectified,” DEIS at 160, it does not disclose or identify these fixes. The lack of specifics and failure to incorporate these fixes into one of the action alternatives violates NEPA, particularly after the agency identified “wildlife connectivity” as one of the significant issues for designing action alternatives for the proposed action.

TLMP requires the Forest Service to coordinate with the IRT “during the planning of activities” and “design projects to maintain landscape connectivity.” *See* 2016 TLMP, WILD1.I. A. and WILD1.VI.A. The IRT process for project-level review is specified in Appendix K to TLMP. Appendix K recognizes the need for a project level review when “[a]ctions are proposed within the [Old Growth Reserve] that will reduce the integrity of the old-growth habitat in the OGR” and when “[t]he OGR will be affected by a land conveyance.” *Id.* Appendix K at K-1, 2.

As noted in SEACC’s scoping comments on the Corrected Notice of Intent in 2017, AR 833_0146, congressional authorization of the West Naukati parcel on Prince of Wales as part of the Alaska Mental Health Trust Exchange resulted in the loss of the Small OGR designated in VCU 5570 by the 2016 TLMP. Although we understand the IRT recommended replacing the lost OGR with 823 Productive Old Growth acres in adjacent VCU 5542, the DEIS does not disclose this recommendation and none of the alternatives include it. As noted in Shanely et al. (2013), these acres have high value for flying squirrel occupancy.³⁴

VI. DEIS Treatment of Niblack and Bokan Mountain Prospects Incomplete, Inaccurate, and Confusing.

We found the discussion in the DEIS regarding two mining prospects, Ucore Rare Metals’ Bokan Mountain project and Heatherdale Resources’ Niblack project, incomplete, inaccurate and confusing. Initially, when discussing present and reasonably foreseeable future projects, the agency explains that although “the owners have recently invested funds in advancing the developing these mines” [sic], “[n]either of these mines have submitted a ‘plan of operations’ in which ground disturbance analysis could be conducted.” DEIS at 47. In fact, Heatherdale is just the latest of several different owners who have conducted exploration at the Niblack venture since the mid-1970s.

Later in the DEIS, when assessing the social and economic conditions and trends on Prince of Wales, the Forest Service sounds like a carnival barker: “Ucore Rare Metals continues

³⁴ See also 833_0147 (attachments to SEACC’s comments on Corrected NOI).

exploratory work at Bokan Mountain, which has been heralded as the ‘Silicon Valley of Rare Earth Elements’ (ADLWD 2012). . . if [the Niblack] was put into production [it] would rival Juneau’s Green’s Creek mine in project scope.” *See* DEIS at 266.

The Forest Service should know better. On July 8, 2013, it issued a Decision Notice and Finding of No Significant Impact authorizing a five-year plan of operations for conducting exploration drilling of 35 holes at Bokan Mountain, installing a temporary 12-person camp facility, and constructing specified infrastructure and facilities. To the best of our knowledge, Ucore has not undertaken any of the permitted actions nor submitted a timely renewal for this permit. According to Ucore’s website, the latest reported exploration activity at Bokan Mountain occurred in 2011.

Niblack differs because all the exploration activities have occurred on private, patented lands not national forest lands. The latest summary of exploration activities is contained in the Niblack Reclamation and Closure Plan 2012 Post-Construction Update at 2-1 (September 25, 2017), which indicates no new exploration at the Niblack since 2008:

This section summarizes construction activities conducted since the Niblack exploration project was initiated on September 21, 2007. The current phase of underground construction and excavation commenced on September 21, 2007 and was completed on July 12, 2008. Placement of NAG material at construction sites was completed shortly thereafter, as was the loading of the temporary PAG waste rock storage facility, completed in spring 2008. No additional expansion of the underground workings, or associated production of waste rock, is anticipated at this time. However, if future expansion does occur, the site design plans presented in the Niblack Solid Waste Landfill Application under the WMP 2013-DB0001 and the Underground Exploration Plan 2012 Post-Construction Update (Integral 2012b) will be followed.

In 2016, DNR’s Large Mine Coordinator informed SEACC by email that:

Niblack was approved for a temporary suspension of operations under their DEC waste management permit in October 2012. That was a three year suspension. DEC approved an extension to their approved suspension in fall 2015. They are now approved for temporary suspension of operations through October 2018.

Clearly, facts show that even after decades of exploration, the Niblack remains a marginal prospect and far from actual development. Please update the DEIS to reflect this information.

VII. Discussion Relating to Effect of Export of Project Timber on Projected Employment and Income is Misleading.

According to the DEIS:

Table 19 displays estimated direct logging, transportation, and sawmilling-related employment and income. The number of jobs and related income shown in Table 19 and Table 20 reflect the difference in domestic processing as compared to differing export percentages. The current export policy allows 100 percent export of Alaska yellow-cedar,

plus the export of western hemlock and Sitka spruce equal to 50 percent of the total net saw log volume. Western red cedar is assumed to be sawn in Alaska due to Section 410 in the Consolidated Appropriations Act, 2018.

DEIS at 104 (emphasis added). Missing from the DEIS is reference to any data or information supporting the agency's assumption. In fact, documents provided to SEACC this year show that Viking Lumber exported 11.5 MMBF of unprocessed Western Cedar logs from two Tongass sales, Big Thorne Stewardship and Camel Back.³⁵ Similarly, Viking exported 1.5 MMBF of unprocessed Western Red Cedar logs in 2016.³⁶ Between 2001 and 2016, data compiled by the Tongass National Forest shows that Tongass operators exported 20.2 MMBF of Western Red Cedar to lower 48 or Pacific Rim markets. See Tongass National Forest Log Exports and Interstate Shipments (2001-2016)(attached). The Forest Service needs to disclose this data and update its analysis in the DEIS to satisfy NEPA and fully inform decision makers and the public.

On June 14, 2018, Senator Murkowski introduced a bill (S. 3073) making appropriation for the Department of Interior and related agencies (e.g., the Forest Service) for fiscal year 2019. This bill contains a provision regularly inserted in annual appropriations acts related to timber sale requirements in Alaska's Region 10. Section 410 of Title IV of the bill prohibits the Forest Service from offering timber sales that appraise negatively and allows the export of western red cedar only under certain conditions; namely, that the red cedar timber "is surplus to the needs of the domestic processors in Alaska." Please explain what methods the Forest Service uses to determine whether red cedar exported in the round is surplus to local needs and disclose data collected by the agency that establishes the accuracy of selected methods.

VIII. Conclusion

For all the reasons discussed above, SEACC and ACAT recommend the agency slow down, withdraw this DEIS and supplement it in order to further the purposes of NEPA.

Best Regards,



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³⁵ See Log Export Application for Big Thorne Stewardship (Feb. 4, 2016); Log Export Application for Camel Back (June 16, 2016).

³⁶ Tongass National Forest Log Exports and Interstate Shipments – 2001 to 2016.

Attachments to SEACC's Comments on POWLLA DEIS (in disc mailed to TBRD)

Southeast Conference, Southeast Alaska by the Numbers (2017)

Landscape Strategy for the 4 Forest Restoration Initiative (Oct. 13, 2009)

Invasive Plants

- Cox C, Surgan M. Unidentified Inert Ingredients in Pesticides: Implications for Human and Environmental Health. *Environmental Health Perspectives* 2006;114(12):1803-1806.
- Van Bruggen et al. 2018. Environmental and health effects of the herbicide glyphosate. *Science of the Total Environment* V 616-617:pp 255-268.
- Parvez et al. 2018. Glyphosate exposure in pregnancy and shortened gestational length. *Environmental Health*
- Antoniou M, et al. 2012. Teratogenic effects of glyphosate-based herbicides: divergence of regulatory decisions from scientific evidence. *J Environ Anal Toxicol.* S4(006):1–13.
- Richard S, et al. 2005. Differential effects of glyphosate and roundup on human placental cells and aromatase. *Environ Health Perspect.* 2005;113(6):716–20.
- Gasnier C, 2009. Glyphosate-based herbicides are toxic and endocrine disruptors in human cell lines. *Toxicology.* 262:184–91.
- Benachour N, et al. 2007. Time and dose-dependent effects of roundup on human embryonic and placental cells. *Arch Environ Contam Toxicol.* 53(1):126–33.
- Mesnage, R. et al. 2015. Potential toxic effects of glyphosate and its commercial formulations below regulatory limits. *Food and Chemical Toxicology* 84:133-153.
- Thongprakaisang, S. et al. 2013. Glyphosate induces human breast cancer cells growth via estrogen receptors. *Food and Chemical Toxicology* 59: 129-136
- OSU Pesticide Fact Sheet: Forestry Use, Glyphosate (compiled Dec. 1996; updated Nov. 2002).
- Muller, M.M. et. al. 1981. Fate of glyphosate and its influence on nitrogen cycling in two Finnish agricultural soils. *Bull. Environ. Contam. Toxicol.* 27:724-730.
- Feng, J.C. and D.G. Thompson. 1990. Fate of glyphosate in a Canadian forest watershed. *J. Agric. Food Chem.* 38:1118-1125.
- Roy, D.N. et.al. 1989. Persistence, movement, and degradation of glyphosate in selected Canadian boreal forest soils. *J. Agric. Food Chem.* 37:437-440.
- Torstensson, N.T.L., L.N. Lundgren, and J. Stenstrom. 1989. Influence of climate and edaphic factors on persistence of glyphosate and 2,4-D in forest soils. *Ecotoxicol. Environ. Safety* 18:230-239.
- McInnis, R.R. 2003. Biological Opinion of the NOAA National Marine Fisheries Service SWR-01-SA-6117:JSS
- Simenstad, C.A. et.al. 1996. Use of Rodeo and X-77 Spreader to control smooth cordgrass in a southwestern Washington estuary. *Environ. Toxicol. Chem.* 15(6):969-978.
- Norris, L.A., H.W. Lorz, and S.V. Gregory. 1991. Forest chemicals: In: Influences of forest and rangeland management on salmonid fishes and their habitats. W.R. Meehan, ed. American Fisheries Society Special Publication 19:207-296.
- U.S. Forest Service. 2000. Glyphosate: Herbicide Information Profile. Pacific Northwest Region. November 17, 2000. 25 pp.
- Tom Aley's Report with Exhibits (June 28, 2005)

- W. Porter, PhD. Report (June 30, 2005)

Documents Excerpted from Response to SEACC's Change Analysis FOIA (2011-TNF-029):

- 05_31_2017 Nourse_memo_to_Chief
- 0807xx_Soda_Nick_analysis_attachments
- 060523_Control_Lake_Small_Sales_II_Change_Analysis
- 070823_DR_to_FS_correspondence
- 100122_Change_Analysis_Salt_change
- Bound_TS_Change_analysis_attachments
- ChangeAnalysis_CableDrop_letter_1998_04_28 – Shortcut
- CherChangeAnalysis
- CRD_deferred_units_Polk_Inlet_Sale_DR_to_FS – Shortcut
- Dumpy_Change_Analysis_1998_2003
- Exhibit_1_LaBrea_Change_Analysis_06_2006
- Fusion_NEPA_Change_Analysis
- North_ChangeAnalysis_1999
- North_ChangeAnalysis_2003
- Setter_Lake_Change_Analysis_Attachment
- Twin_Shovel_Sale_Change_Analysis
- Diesel Folder:
 - 3379_Diesel_CA_1&2
 - 3380_Diesel_CA_3
 - 3401_DIESEL CONTRACT A SECTION
 - 3401_DIESEL CONTRACT A SECTION
 - 3404_Diesel PreOp
 - 3405_Diesel_Sale_Area_Maps_1&2
 - 091201_Diesel_CA_Exhibits_1_&_2
 - 091201_FS_concurrence_to_DR
 - Diesel_CA_3
 - Diesel_correspondence_DR_to_FS
- Slate Folder:
 - 3403_DIESEL CONTRACT PROVISIONS
 - 100910_Slake_CA_Exhibit_1
 - 100910_Slake_CA_Exhibit_1_Tables
 - 100910_Slake_CA_Exhibit_2
 - 100910_Slake_CA_exhibit_3_maps
 - 100910_Slake_CA_IDT_DR_correspondence
 - 109010_Slake_CA_FS_DR_concurrance*
 - 109010_Slake_CA_DR_FS_correspondence

Niblack Reclamation and Closure Plan 2012 Post-Construction Update at 2-1 (September 25, 2017)

Email from DNR's Large Mine Coordinator to Archibald, SEACC (Feb. 2, 2016)

Documents Excerpted from Response to SEACC's Export FOIA, 2018-RO-06 (Mar. 16, 2018):

- 2016-1Big Thorne WRC
- 2016-4WRC_Camel_Back
- Log Exports_Intrastate Shipments 2001-16