Comments on the Scope of the Environmental Impact Statement for the Proposed Gateway Pacific Terminal

Summary

Environmental review for the proposed Gateway Pacific Terminal (GPT) requires a broad scope to address the numerous and diverse impacts that the project would impose. Because most of those impacts would be irreversible, the review also must be done carefully. Development and operation of the GPT and associated commodity transport by rail and ship would foreclose future options that merit careful consideration as required by SEPA. These options include local development in Bellingham, regional rail and ship transport, marine conservation, and addressing climatic impacts. The EIS scope should include the context for GPT, which includes transport of coal and other commodities by rail and ship and similar development and operation of five other proposed export terminals. My comments here outline significant impacts to the natural environment that likely would occur during GPT development and operation and commodity transport associated with GPT and other proposed export terminals. These impacts should be included in the scope of the EIS for the proposal. Implementation of the proposal likely would cause significant impacts to 14 of the 21 SEPA elements of the natural environment at local or regional scales. Including these impacts in the EIS scope will be necessary for adequate environmental review of the proposal.

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1 Foreclosure of other options [WAC 197-11-440(5)(c)(vii)]

Developing and operating the Gateway Pacific Terminal (GPT) and other coal export terminals may foreclose options in several important contexts. Impacts of the GPT via foreclosure of these options should be evaluated in the EIS, as directed in WAC 197-11-440(5)(c)(vii)]. Potentially foreclosed options include, but are not limited to, the following.

Rail use: use of rail transport capacity for other purposes, particularly passenger transport. Currently, Amtrak schedules and performance relative to published timetables are constrained by use of rail capacity for freight transport. A substantial increase in freight transport to deliver cargo to the GPT and other proposed export terminals could foreclose options to maintain or increase passenger rail service.

Shipping and associated commerce: use of shipping lanes for other traffic, including higher value commodities. Increasing use of constrained shipping lanes accessing the GPT and/or other proposed export terminals may approach or exceed capacity of those shipping lanes, as determined by various marine impact thresholds listed below. Using shipping lane capacity for GPT traffic could foreclose options for shipping other kinds of commodities, including commodities with higher value than raw materials such as coal.

Marine conservation and restoration. Impacts of developing and operating the GPT may impede conservation and restoration programs in Puget Sound and the Salish Sea. Substantial conservation and restoration initiatives have generated some improvements, but progress to date has not been sufficient to meet ecosystem restoration goals (Puget Sound Partnership 2012). Further impacts caused by GPT development, GPT operation, and shipping traffic associated with GPT may foreclose on future opportunities for marine conservation and restoration.

Bellingham waterfront development. Increased freight train traffic and associated noise, diesel emissions, and coal dust resulting from rail cargo transport to GPT could foreclose on options to develop Bellingham's waterfront. Waterfront development plans depend on actual and perceived connectivity between the waterfront site and the rest of Bellingham. If rail traffic associated with GPT operation impedes or is expected to impede vehicle and pedestrian access to the waterfront site, then waterfront development options may be foreclosed because public officials, development investors, and potential waterfront property tenants may direct their interests to alternative sites. The potential value of these foreclosed options associated with Bellingham waterfront development is estimated to be roughly $2 Billion, which likely would exceed the total value of revenues, wages, and tax payments associated with GPT development and operation. The potential for GPT development and operation to foreclose on Bellingham waterfront development options and the relative value of those options should be included in the scope of the GPT EIS.

Mitigating or preventing further climate change impacts, including transition to carbon-free energy sources. Developing and operating the GPT and other proposed export terminals would facilitate combustion of large quantities of coal in Asia. Combustion of that coal would prolong the accelerating global trend of greenhouse gas emissions, and largely negate efforts in other regions to shift toward carbon-free energy sources. This would foreclose on options to prevent

or mitigate climate change impacts, because atmospheric CO_2 concentrations driving those impacts would continue to increase and resulting impacts could exceed societal and ecological capacities for adaptation or mitigation (Binder *et al.* 2010). In addition, continued coal combustion facilitated by GPT and/or other proposed export terminals would foreclose on options for gradual transitions to carbon-free energy sources. Continued coal combustion in quantities facilitated by GPT and/or other proposed export terminals would increase atmospheric CO_2 concentrations so much that severe measures to achieve energy source transitions would be required, causing large social, economic, and environmental impacts (Davis *et al.* 2013; Lowe *et al*. 2009).

A compelling argument could be made that options to develop and operate GPT and other proposed coal export terminals have been foreclosed already, due to national and international failure to limit greenhouse gas emissions. A large scientific literature now concludes that greenhouse gas emissions to date have consumed or exceeded the capacity of Earth's atmosphere and oceans to absorb those gases within constraints of a climate compatible with contemporary civilization. Hence, further coal combustion facilitated by GPT and other proposed terminals would consign future generations to unacceptable costs and intolerable conditions in many areas. This would violate SEPA's charge [WAC 197-11-440(5)(c)(vii)] that "The agency perspective should be that each generation is, in effect, a trustee of the environment for succeeding generations." In this regard, the lead agency(ies) could not both maintain the perspective that this generation is an environmental trustee while approving permits for a project(s) that would cede an unstable climate to succeeding generations.

2 Impacts: Introduction

To assist you in the difficult task of defining the EIS scope for the proposed GPT, other proposed export terminals, and associated commodity transport, my comments below follow the order listed in SEPA, WAC 197-11-444 Elements of the Environment. My comments below are restricted to impacts to elements of the natural environment, corresponding to my areas of expertise. Impacts to many elements of the built environment also would result from development and operation of GPT, development and operation of other proposed export terminals, and transport of commodities to those terminals. My comments here do not address impacts to the built environment, although such impacts should be included in the EIS scope. Each impact to elements of the natural environment listed below likely would exceed the threshold of significance as defined in SEPA and NEPA, and therefore each should be included in the EIS scope.

Two contextual issues must be resolved to define the scope of the development proposal appropriately. First, the GPT proposal was not developed nor would it operate independently of rail transport of commodities to the terminal and cargo ship transport of those commodities away from the terminal. Because the GPT would be inextricably linked to rail transport and cargo ship transport of commodities – mostly coal – the scope of the EIS must include impacts of rail and ship transport of those commodities. Second, the proposal to develop and operate GPT at Cherry Point is one of six export terminals proposed in Washington and Oregon. These terminals likely would share most of their commodity sources and commodity destinations, and transport of the

commodities to and from the terminals would occur over most of the same rail lines and shipping routes. For these reasons, the terminals would not function independently, but rather would operate within the same chain of producers, transporters, and purchasers. In this context, the set of proposed terminals should be considered linked, their environmental impacts should be considered linked, and the EIS should review the cumulative impacts of all proposed terminals and their associated transport of commodities by rail and ship.

3 Impacts to the Natural Environment

The following impacts likely would exceed the threshold of significance as defined in SEPA and NEPA, and therefore these impacts should be included in the scope of the EIS for the proposal.

(a) Earth

(ii) Soils

Soil disturbance during GPT development.

Soil contamination from coal dust escaping from GPT holding facilities, GPT loading facilities, and from coal dust emitted from trains throughout the transportation route from mine sites to the GPT and other shipping terminal sites. Contamination of wetland and agricultural soils throughout the transportation route, including soils along the alternative rail line in the South Fork Nooksack valley, should be part of the EIS scope.

Soil contamination, particularly airborne mercury deposition, from combustion of coal exported to Asia from GPT and other proposed export terminals.

(iv) Unique physical features

Ship fuel spilled and resulting impacts to unique features in intertidal and nearshore environments in the Salish Sea.

Impacts to unique eelgrass meadows at to Cherry Point Aquatic Reserve due to GPT development, shading, discharge of cargo ship contaminants, release of coal dust from trains, GPT holding facilities, and GPT loading facilities, ship-induced changes in nearshore currents, and invasive marine species introduced by cargo ships.

(v) Erosion

Erosion of soils due to vegetation loss and wetland destruction or degradation at the GPT site.

Erosion during GPT construction.

Erosion due to stormwater runoff from increased impervious surface area at the GPT site.

Erosion of coastal areas due to rising sea level and increasing storm surge severity exacerbated by increasing atmospheric CO_2 concentration, contributed in part from combustion in Asian power plants of coal transported from GPT and other proposed export terminals.

(b) Air

(i) Air quality

Air quality degradation throughout the transportation route from mine sites to GPT and other shipping terminal sites due to train diesel engine emissions.

Air quality degradation throughout the transportation route from mine sites to GPT and other shipping terminal sites due to coal dust escaping from rail cars.

Air quality degradation in the vicinity of GPT and other proposed terminal sites due to coal dust escaping from coal holding and loading facilities.

Air quality degradation throughout the Pacific Northwest from atmospheric transport of emissions from Asian power plants burning coal transported from GPT and other proposed export terminals.

(ii) Odor

Impacts to odor throughout the transportation route from mine sites to GPT and other shipping terminal sites due to train diesel engine emissions.

(iii) Climate

Impacts to local, regional, and global climates due to combustion in Asian power plants of coal transported from GPT and other proposed export terminals. Although climatic impacts have and will continue to result from greenhouse gas emissions from many sources, GPT and other proposed export terminals would facilitate increased greenhouse gas emissions by supplying large quantities of coal to Asian power plants. By providing access to large quantities of coal to supply growing Asian markets, the GPT and other proposed export terminals would reduce or delay economic incentives for Asian nations to implement carbon-free energy alternatives. The climate impacts resulting from coal export from GPT and other proposed may include the following (Binder *et al.* 2010, Elsner *et al* 2010, Kim *et al*. 2002, Mantua *et al*. 2010, Miles *et al.* 2010, Mote *et al.* 2003, Wu *et al.* 2012).

Increased winter flooding risk.

Reduced water storage in the form of winter and spring snowpack.

Increased storm severity and storm damage.

Increased risk of summer drought.

Increased risk of destructive summer heat.

Increased streamwater temperatures and resultant declines in water quality.

Accelerated glacial recession.

Increased sediment deposition in lower river reaches and resultant flooding risk, following glacial recession.

Increased sea level rise and resultant coastal flooding and saltwater contamination of coastal lands.

Increased acidification of marine waters and resultant impacts to marine environments, including harvested finfish and shellfish.

(c) Water

(i) Surface water movement/quantity/quality

Impacts to surface freshwater quality due to coal dust deposition throughout the transportation route from mine sites to the GPT and other shipping terminal sites.

Impacts to marine surface water quality due to coal dust deposition from coal holding and loading facilities at GPT.

Impacts to surface freshwater and marine water quality due to contaminated stormwater runoff from impervious surfaces and coal holding facilities.

Impacts to marine surface water quality due to fuel spills and other discharges from cargo ships accessing the GPT and other proposed shipping terminal sites.

(ii) Runoff/absorption

Increased stormwater runoff and reduced stormwater absorption due to vegetation clearing and wetland destruction or degradation at the GPT site.

Increased stormwater runoff due to increased storm frequency and intensity, resulting from climate change exacerbated by products of coal combustion facilitated by coal exports from GPT and other proposed export terminals.

(iii) Floods

Increased flooding frequency and severity, resulting from climate change exacerbated by products of coal combustion facilitated by coal exports from GPT and other proposed export terminals. Flood risk would increase throughout the Pacific Northwest due to increased storm frequency and severity. Flood risk also would increase in coastal areas due to increased sea level rise, compounded by increased storm surges.

(v) Public water supplies

Climatic impacts listed above under (b)(iii) would affect public water supplies throughout the Pacific Northwest. Many cities, towns, and rural residents in the region depend on water derived from glaciers and snowmelt. Climatic impacts due to burning coal exported from GPT and other proposed terminals would hasten glacial recession and reduce water storage in snowpacks. The consequent reductions in public water supplies would cause substantial environmental, social, and economic impacts.

(d) Plants and Animals

(i) Habitat for and numbers or diversity of species of plants, fish, or other wildlife

Many important intertidal, benthic, nearshore, and offshore marine habitats could be degraded, displaced, or destroyed by invasive marine species introduced by cargo ships accessing GPT and other proposed export terminals. These invasive species could be introduced via ship ballast water or transported on ship hulls. Although project proponents or others may propose inspection and containment measures to prevent or mitigate impacts of invasive species, such measures cannot succeed unless they are 100% effective. Achieving 100% effectiveness is not possible and never has been throughout the history of human trade and travel. Heroic containment efforts, dating from Australia's "rabbit-proof fence," have failed and will continue to fail. The failure rate, or invasive species introduction rate, would increase markedly with large increases in cargo ship traffic accessing GPT and other proposed export terminals. Potential impacts from diverse invasive marine species to the full range of marine habitats (rocky intertidal, mudflat, soft benthic, subtidal reef, eelgrass meadow, kelp forest, sandy beach, cobble beach, salt marsh and other tidal wetlands, riparian estuary, coastal fjord, and open marine water) should be included in the EIS scope.

Many important intertidal, benthic, nearshore, and offshore marine habitats could be degraded or destroyed by fuel spilled and other contaminants discharged from cargo ships accessing GPT and other proposed terminals. Habitats at risk include areas vital to sensitive species, such as eelgrass spawning sites for the Cherry Point herring population and estuaries and other nearshore habitats used by young salmon. These impacts could result from chronic small discharges or large spills. Impacts from both kinds of contaminant releases should be included in the EIS scope.

Many important intertidal, benthic, and nearshore marine habitats could be impacted by coal dust escaping from coal storage and loading facilities at GPT and other proposed export terminals.

Many species of plants, fish and wildlife could be injured, extirpated, or reduced in distribution and/or abundance by invasive marine species introduced by cargo ships accessing GPT and other proposed export terminals. These invasive species would be introduced via ship ballast water or transported on ship hulls, despite prevention or containment measures as describe above. Impacts of introduced invasive marine species on native flora and fauna should be included in the EIS scope. These introduced species may include herbivores, competitors, predators, parasites, fungi, and viral or bacterial disease organisms.

Increased marine noise resulting from increased cargo ship traffic accessing GPT and other proposed export terminals could reduce or sever marine habitat connectivity. These impacts are most likely for habitats used by marine mammals and other species particularly sensitive to marine noise. The sound volume and frequency of cargo ship traffic constitutes a potential noise barrier that some marine organisms would avoid or rarely cross. The risk of noise impacts on habitat connectivity and the consequences of these impacts should be included in the EIS scope.

Impacts to the Cherry Point Aquatic Reserve due to many factors listed above and below could negatively affect the network of marine reserves in the Salish Sea and beyond. This network includes 127 marine protected areas in Washington (Van Cleve *et al*. 2009), most of which could be affected by contaminants, invasive marine organisms, and marine noise associated with ship traffic accessing the GPT. Impacts to one reserve (i.e., Cherry Point) would affect other reserves in the network in diverse ways that depend on the nature of the impacts, proximity of reserves relative to Cherry Point, marine current patterns, and species associated with impacts. These impacts should be included in the EIS scope, and assessing them will require methods developed to study spatially structured marine systems (White *et al*. 2011) and metapopulation dynamics.

Development of GPT and other proposed export terminals, operation of GPT and other proposed terminals, and cargo ship traffic accessing those terminals likely would reduce abundances, distributions, and diversity of many other marine species. These include other marine mammals, great blue herons, bald eagles, many seabirds, surf smelt, sand lance, other fin fishes, many shellfish species, many other benthic marine invertebrates, many intertidal invertebrates, and diverse marine macroalgae species. Each of these species could be impacted by one or more of the following factors: contaminants released by cargo ships; invasive marine organisms transported into local marine waters by cargo ships; coal dust escaping from trains, GPT holding facilities, and GPT loading facilities; increased ocean acidification due to coal combustion; increased sea level rise due to coal combustion. Impacts from these factors on these diverse species should be included in the EIS scope. In addition to species-specific impacts, the EIS scope should include impacts at the system level, such as substantial shifts in species composition resulting from introduced marine organisms or large fuel spills from cargo ships.

Rail transport of cargo to GPT and other proposed export terminals could impact many terrestrial animals. Frequent train traffic could impact many nonvolant species both through collision mortality and by creating movement barriers. These issues have been studied most thoroughly in Banff, Alberta (e.g., Clevenger and Waltho 2000), but a connectivity assessment for the region south of the proposed GPT site was conducted recently (Strittholt *et al*. 2003). A similar analysis should be conducted for the entire rail transportation route from mine sites to the GPT and other shipping terminal sites. The Strittholt *et al*. (2003) assessment did not consider railroad impacts of because train frequency was relatively low then. A similar analysis for this EIS must consider train traffic impacts up to maximum anticipated train frequency.

(ii) Unique species

Orca populations inhabiting the Salish Sea may be affected in diverse ways by GPT development and operation and associated ship traffic. Orcas are severely contaminated by fat-soluble toxins already, and additional contaminants introduced by cargo ship discharges and coal dust may impact orcas beyond acceptable thresholds. Evaluation of these contaminants should consider the apex position of orcas in the food web and the bioaccumulative nature of many contaminants of concern.

Orca populations inhabiting the Salish Sea are known to be sensitive to marine noise. Cargo ships accessing GPT would increase marine noise substantially, potentially

disrupting orca reproduction, habitat use, spatial population structure, and individual health. Orca populations in the Salish Sea are at risk already; these additional impacts may push orcas beyond thresholds of viability. At minimum, noise impacts are likely to reduce orca habitat use and distribution.

Orcas and other marine mammals would be "impacted" by collisions with cargo ships. The large increase in cargo ship traffic accessing GPT and other proposed export terminals could injure and kill many individual marine mammals, which could cause substantial impacts to populations of these species.

Several salmon species and many unique salmon runs use the Salish Sea during important parts of their life cycles. All regional salmon use marine areas that would be impacted by contaminants and invasive species introduced by cargo ships associated with GPT. Most salmon use nearshore marine habitats soon after leaving freshwater, where they find refuge from larger marine predators. Impacts on salmon in nearshore habitats degraded by contaminants and/or introduced marine species should be included in the EIS scope. Similarly, direct impacts on salmon of contaminants and introduced marine species should be included in the EIS scope. Assessment of impacts to salmon should employ stage-structured population models (e.g., Scheuerell *et al.* 2006), because those impacts would affect particular stages in salmon life cycles and because such effects cannot be assessed accurately using stage-independent analyses (Caswell 2000).

The Pacific herring population spawning at Cherry Point is unique in phenology and historic abundance. Causes of abundance declines and age structure shifts in this population are not well understood, but must be to assess potential impacts of GPT development and operation on Cherry Point herring. The EIS scope must include definitive study of Cherry Point herring status, abundance decline and age structure shifts, and potential additional impacts that would result from GPT development, GPT operation, and cargo ship traffic – including consequences of contaminants and invasive species released by cargo ships. Assessment of impacts to Cherry Point herring must employ age-structured population models, because those impacts would affect particular stages in the herring life cycle. Spatially structured herring metapopulation models also may be required to account for the decline in the Cherry Point herring population and likely GPT impacts to that population and other regional herring populations.

The marbled murrelet uses nearshore marine habitats throughout the year. These habitats include Cherry Point and many areas that could be impacted by GPT development, GPT operation, and shipping traffic associated with GPT and other proposed export terminals. Although the primary cause of decline in the CA, OR, and WA population of this federally threatened species is loss of terrestrial forest habitat, further impacts could undermine efforts to prevent extinction and ultimately restore the population. In this context, the EIS should address potential impacts of GPT, other proposed export terminals, and associated shipping traffic on marbled murrelets. Impacts of particular concern for the murrelet include release of contaminants in nearshore marine habitats, introduction of invasive marine species, and factors causing declines in fish that murrelets feed on.

(i) Fish and wildlife migration routes

GPT operation and cargo ship traffic accessing GPT and other proposed terminals could disrupt or impede migration of many marine species due to chemical contamination, marine noise, or a combination of factors.

Cargo ship traffic would cross the Pacific gray whale migration route to access every proposed export terminal. Frequent cargo ship traffic could generate enough marine noise to disrupt the whale migration. Severity of this potential impact should be included in the EIS scope.

Cargo ship traffic through areas used by several orca populations could disrupt orca seasonal migrations due to marine noise or collision impacts. Impacts of marine vessel traffic on orcas have reached levels requiring mandatory protections enforced by Washington Department of Fish and Wildlife (WDFW 2012). These regulations do not apply to large cargo ships, and hence impacts to orca migration routes by cargo ships accessing GPT would not be mitigated. These impacts and their effects on orca migration behavior, habitat use, distribution, and population status should be included in the EIS scope.

Salmon migration routes in nearshore habitats may be affected by contaminants released by cargo ships accessing GPT and other proposed export terminals and by coal dust escaping from those terminals. Young salmon recently entering marine waters may be particularly vulnerable to contaminants discharged into nearshore environments. These impacts should be included in the EIS, which will require analyzing salmon movement patterns throughout nearshore habitats in the vicinity of each proposed export terminal.

Migration of Pacific herring to spawning habitat at Cherry Point may be impeded by contaminant discharges from cargo ships, contaminant discharges from GPT operations, coal dust escaping from GPT holding and loading facilities, sediment transported into spawning habitat via GPT stormwater discharges, and shading of spawning habitat resulting from GPT development and operation. Similarly, migration of juvenile herring away from rearing habitat at Cherry Point may be affected by similar factors. These impacts should be included in the EIS scope.

Seasonal migration of nonvolant terrestrial wildlife may be disrupted by frequent train traffic carrying cargo to GPT and other proposed export terminals. Impacts to relevant species should be included in the EIS scope, which will require comparing the rail transportation route from mine sites to GPT and other shipping terminal sites with information on wildlife distributions and migration routes. Some species would be particularly vulnerable. For example, the western toad undergoes explosive metamorphism, during which young toads migrate en masse from aquatic breeding sites to terrestrial habitats. Heavy train traffic during the brief migration period could exterminate large population fractions of this WA state candidate species.

(e) Energy and Natural Resources

(v) Scenic resources

Visual impacts to scenic resources due to coal dust blowing from rail cars, coal holding facilities and coal loading facilities at GPT and other proposed export terminals. Scenic resources are particularly important to quality of life and economic activity in the region surrounding Cherry Point and many other areas along the intended rail transport routes. Consequently, impacts to scenic resources should be evaluated thoroughly in the EIS.

Visual impacts due to smog and other coal combustion products blowing from Asia could affect many scenic resources in the Pacific Northwest.

Impacts due to fuel spills and other cargo ship discharges could damage many scenic resources in the Salish Sea. These impacts could undermine local economies in many areas that depend on scenic resource quality.

Marine mammals, particularly orcas and other cetaceans, are considered scenic resources that enhance quality of life and support many businesses in the Salish Sea. Impacts to marine mammals from cargo ship noise could irrevocably damage these resources.

Intertidal and nearshore marine organisms and habitats are considered scenic resources that enhance quality of life and support many businesses in the Salish Sea. These resources could be severely and permanently damaged or destroyed by invasive marine species introduced by cargo ships, via ballast water or transported on ship hulls. These impacts and their impacts to quality of life, employment opportunities, and economic activity should be included in the EIS scope.

4 Impact Summary

WAC 197-11-444 Elements of the environment

Elements of Natural Environment	Relevant Impacts*	Local impact	Regional impact
(a) Earth			
Geology			
Soils	disturbance, contamination	XX	
Topography			
Unique physical features	ship discharges	XX	X
Erosion	veg., wetland loss; sea level rise	XX	X
(b) Air			
Air quality	diesel exhaust, coal dust, smog	XX	X
Odor	diesel exhaust	XX	
Climate	precipitation, storms, floods, etc.	X	X
(c) Water			
Surface water	ship discharges, coal dust, stormwater	XX	X
Runoff/absorption	stormwater	XX	
Floods	climate change induced	X	X
Ground water			
Public water supplies	reduced supply/snowpack	X	X
(d) Plants and Animals			
Habitat, numbers, spp diversity	invasive spp, ship discharges, noise	XX	XX
Unique species	invasive spp, ship discharges, noise	XX	XX
Fish or wildlife migration routes	ship discharges, noise, train traffic	X	X
(e) Energy and Natural Resources			
Amount/rate of use/efficiency			
Source/availability			
Nonrenewable resources			
Conserv./renewable resources			
Scenic resources	invasive spp, discharge, coal dust, noise	XX	XX
TOTAL Impact categories (21)	**Local Impacts: 14 categories** **Regional Impacts: 11 categories**	**XX:10** **X:4**	**XX:3** **XX:8**

***** Not all impacts are listed due to space constraints; see text for all impacts.

XX: significant negative impact certain or likely
X: significant negative impact may occur

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