ENVIRONMENTAL ASSESSMENT

PROPOSED REVISION AND RENEWAL OF PERMIT WA-0007D

John Henry No. 1 Coal Mine
Pacific Coast Coal Company
King County, Washington

Prepared by
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Reclamation and Enforcement
Western Region
Denver, Colorado

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

Text	Acronym
Ammonium Nitrate Fuel Oil	ANFO
Approximate Original Contour	AOC
Bald and Golden Eagle Protection Act	BGEPA
Bank Cubic Yard	BCY
Best Available Control Technology	BACT
Carbon Dioxide Equivalent	CO2e
Clean Air Act	CAA
Code of Federal Regulations	CFR
Compacted Cubic Yard	CCY
Council on Environmental Quality	CEQ
Cumulative Hydrologic Impact Assessment	CHIA
East	E
Environmental Assessment	EA
Environmental Impact Statement	EIS
Final Environmental Impact Statement	FEIS
Greenhouse Gases	GHGs
Growth Management Act	GMA
Hydrologic Unit Codes	HUD
Interagency Monitoring of Protected Visual Environments	IMPROVE
Intergovernmental Panel on Climate Change	IPCC
Interstate	I
Kilowatt Hours	kWh
King County Department of Permitting and Environmental Review	DPER
Level of Service	LOS
Master Planned Development	MPD
Microgram Per Liter	µg/L
Migratory Bird Treaty Act	MBTA

Text	Acronym
Mine Safety and Health Administration	MSHA
National Ambient Air Quality Standards	NAAQS
National Environmental Policy Act	NEPA
National Hydrography Dataset	NHD
National Marine Fisheries Service	NMFS
National Pollutant Discharge Elimination System	NPDES
New Source Performance Standards	NSPS
North	N
Notice of Construction	NOC
Office of Surface Mining, Reclamation and Enforcement	OSMRE
Pacific Coast Coal Company	PCCC
Post-mine Lake	PML
Probable Hydrologic Consequences	PHC
Priority Habitat and Species	PHS
Puget Sound Air Pollution Control Agency	PSAPCA
Puget Sound Clean Air Agency	PSCAA
South	S
State Environmental Policy Act	SEPA
State Route	SR
Surface Mining Control and Reclamation Act	SMCRA
Total Maximum Daily Load	TMDL
Total Suspended Particulates	TSP
United States Army Corps of Engineers	USACE
United States Environmental Protection Agency	EPA
United States Fish and Wildlife Service	USFWS
Washington Department of Fish and Wildlife	WDFW
Washington Department of Game	WDG
Washington Department of Natural Resources	WDNR
Washington Department of Ecology	WDOE
Washington Department of Transportation	WDOT
West	W
Wetland Resources, Inc.	WRI

1.0 DESCRIPTION OF THE PROJECT AND PROPOSED ACTION

Pacific Coast Coal Company (PCCC) submitted a permit revision application to revise Federal permit WA-0007D on April 18, 2011 to the Office of Surface Mining, Reclamation and Enforcement (OSMRE). This permit revision would allow the continuation of surface coal mining operations under authority of the Surface Mining Control and Reclamation Act (SMCRA), Public Law 95-87.

PCCC has not engaged in substantive coal mining operations since 1999. Environmental maintenance activities and monitoring have been ongoing since that date. PCCCs permit renewal applications (2011 and 2016) have been under administrative delay pending the completion of an Environmental Assessment (EA) of PCCCs proposed permit revision.

John Henry No. 1 Mine is located in King County, Washington, near the City of Black Diamond (Figure 1). PCCC proposes to continue mining in Pit 1 and Pit 2, as shown in large mining area on Figure 2. PCCC proposes to mine 737,000 short tons of minable coal reserves (462,000 processed short tons) over a 6-year period and disturb an additional 29.7 acres of land. Reclamation would occur contemporaneously with active mining.

This EA has been prepared to disclose and analyze the potential environmental effects of PCCC's proposed permit revision application (hereafter referred to as the "Proposed Action"). An EA is a site-specific analysis of potential effects that could result in the implementation of the Proposed Action or Alternative(s). An EA assists OSMRE in project planning, ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any "significant" effects could result from the Proposed Action. Significance is defined by the NEPA in regulation 40 Code of Federal Regulations (CFR) § 1508.27.

An EA provides analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of "Finding of No Significant Impact" (FONSI). If OSMRE determines in the EA analysis that a project may have "significant" impacts that cannot be mitigated to "less than significant," then an EIS will be prepared for the project. If OSMRE determines there will be no significant impacts, then OSMRE may issue a FONSI with the EA. The FONSI documents the decision that the implementation of the selected alternative would not result in significant environmental impacts based on the analyses in the EA.

Chapter 1 presents the purpose and need of the Proposed Action and the analysis of Alternative Actions. Chapter 2 describes the public comments and identified issues. Chapter 3 describes the existing environment of the project area and the potential direct and indirect environmental impact from each alternative. Chapter 4 describes the potential cumulative environmental impacts from the Proposed Action.

Figure 1. Vicinity Map of the John Henry No. 1 Mine in Black Diamond, Washington

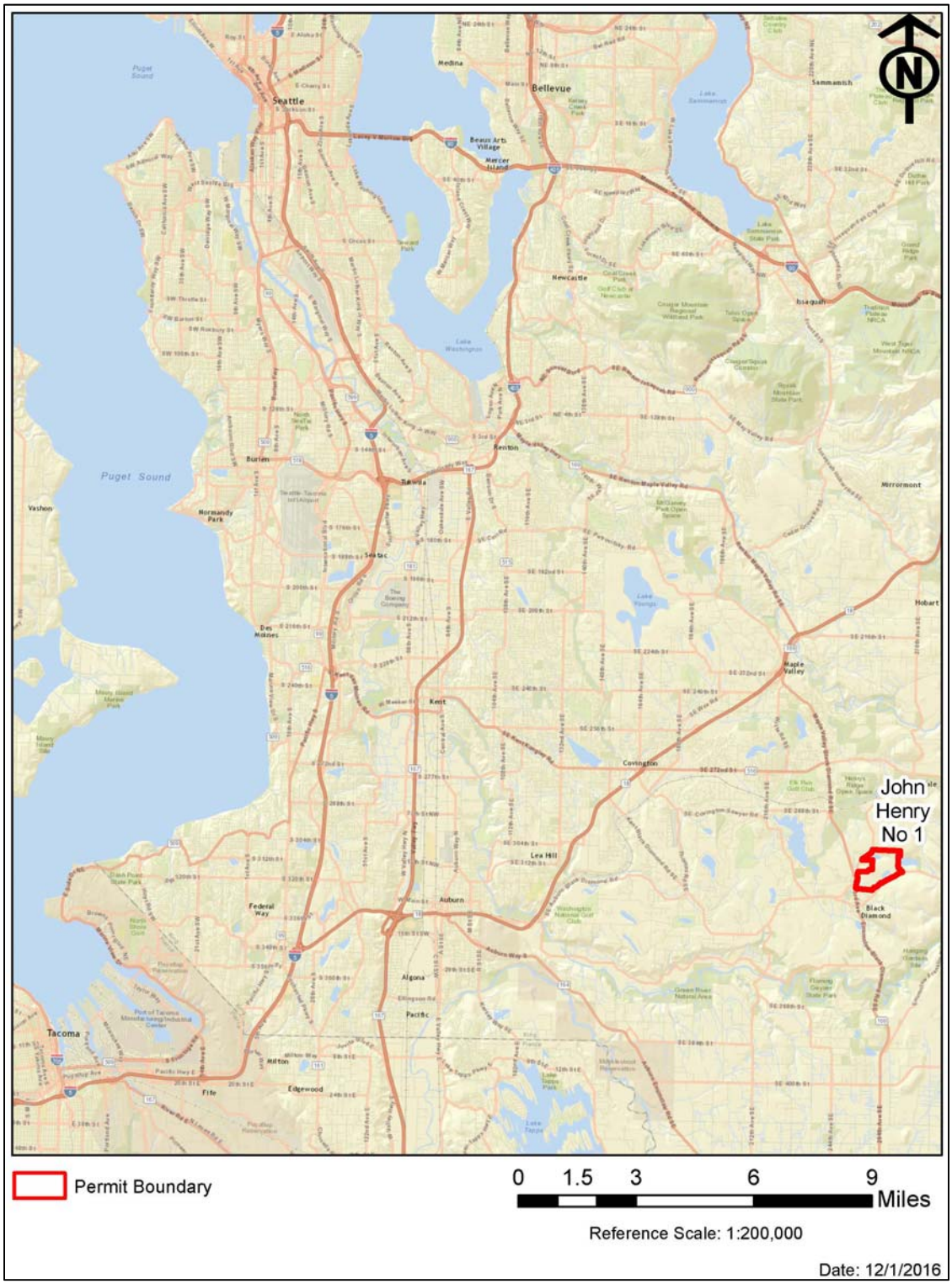
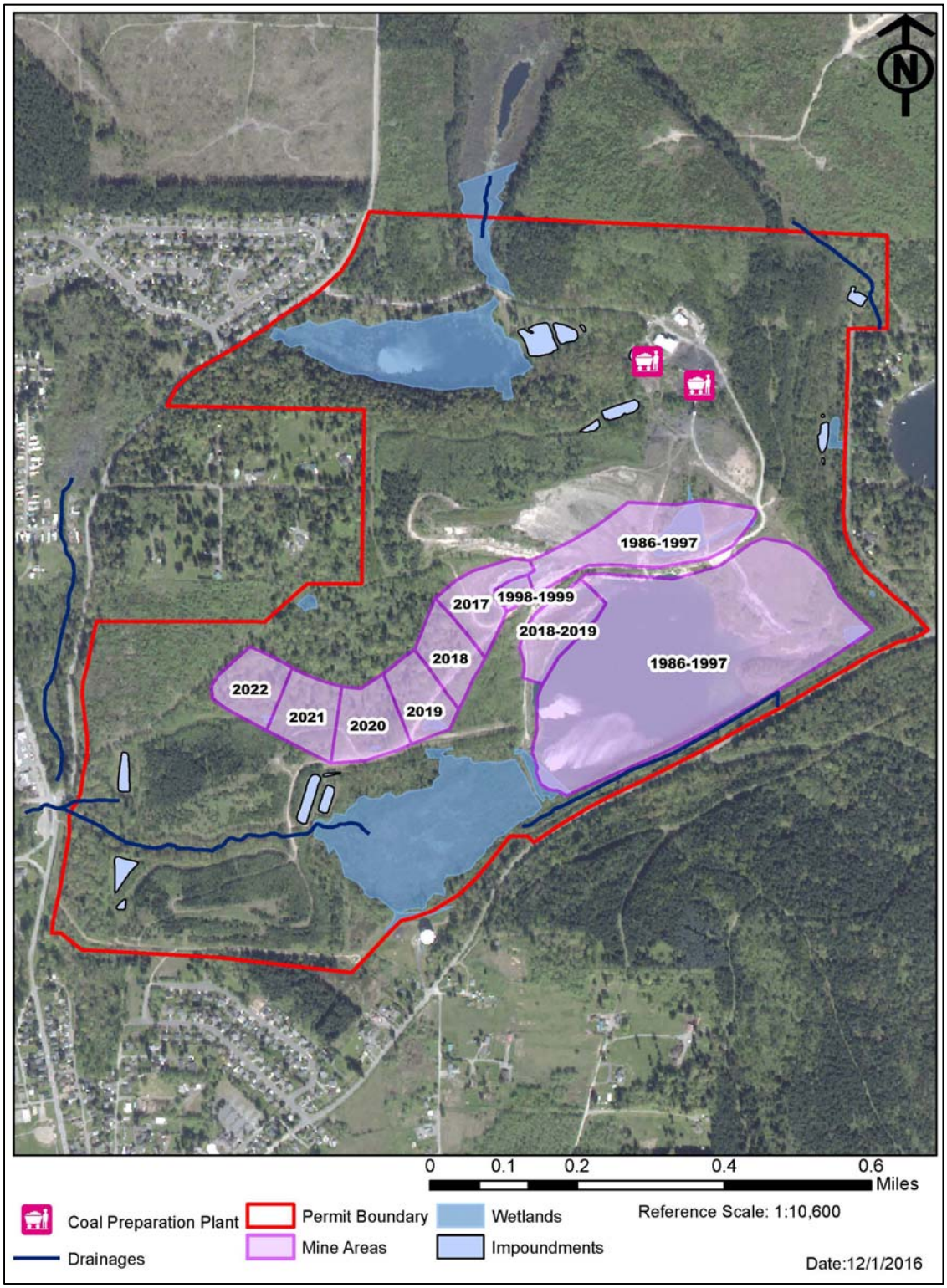


Figure 2. Mine Plan Map



1.1 Background Information

The John Henry No. 1 Mine[1] consists of 480 acres of privately owned land located in south King County, Washington adjacent to the City of Black Diamond. Before mining could begin in 1986, the land was rezoned to a Quarry/Mining designation by King County to allow issuance of a grading permit. A Washington State Environmental Policy Act (SEPA) EIS was prepared in the 1980's as part of the rezoning application, and included public hearings before a King County Hearing Examiner. The pre-mining land use was unmanaged forest and fish and wildlife habitat.

In accordance with provisions of Section 504 of SMCRA, OSMRE implemented a Federal program on May 16, 1983, (48 F.R. 22291) for the regulation of coal mining activities within the State of Washington. OSMRE analyzed the environmental impacts of mining for the proposed John Henry No. 1 Mine in the Final Environmental Impact Statement (FEIS) (OSM-EIS-13) (OSMRE 1985). The John Henry No. 1 Mine permit was issued June 12, 1986 after public input and mining began in June of that year. A new 150 ton per hour coal processing plant was built on site in 1990 and the mine reached full production in 1991.

The 1985 FEIS examined the impacts over the entire life-of-mine area including the remaining 29.7 acres that would be disturbed under the Proposed Action analyzed in this EA. Where applicable, this EA references the 1985 FEIS for relevant background or baseline information. This EA is conducting an environmental analysis of the current and future conditions of the Alternatives presented in Section 1.3, *Proposed Action Alternative*, and 1.4, *No Action Alternative*.

In accordance with SMCRA regulations, coal-processing wastes would be backfilled in the pits and covered with at least four feet of clean overburden material prior to final reclamation. The detailed coal waste disposal plan is described in Section 3.4.8 of the currently approved PAP. Coal waste was initially deposited with spoil material in the external spoil piles. Beginning in 1994, all coal waste was disposed in the mined out area of Pit 1 and mixed with overburden material. Before OSMRE approved the 1986 PAP, it required chemical testing of the coal waste, including toxicity tests. From this testing, OSMRE concluded there were no indications of any health hazard associated with the coal processing waste. It was determined that the material contained no acid or toxic forming materials.

PCCC used open-pit mining methods to mine coal in six coal seams from two separate mine pits. Pit 1 accounted for most mining during the initial 13 years, although some mining occurred in Pit 2. From 1986 until 1999, PCCC mined 3,047,000 short tons of coal and removed 14,729,000 bank cubic yards (BCY) of overburden. As part of the open pit mining operation that began in 1986, 8,228,000 BCY of overburden and coal processing waste material were placed into four temporary spoil piles and referred to as Spoil Pile 1, Spoil Pile 2, Spoil Pile 3 North, and Spoil Pile 3 South. Placement of spoil in spoil piles ended in 1992. From 1993 until 1999 all

[1] John Henry No. 1 Mine is referred to as the Mine and the project throughout the EA.

removed overburden was directly backfilled into mined pits in compliance with contemporaneous reclamation requirements. During this time (1993 to 1999) 8,563,000 BCY of overburden was backfilled in Pits 1 and 2. A total of 13 acres of Pit 1 have been backfilled and graded.

The temporary spoil piles have been covered with topsoil and planted with Douglas fir trees. The currently approved reclamation plan requires that a portion of each of these piles be reduced to achieve approximate original contour (AOC). As approved by OSMRE in 2001, Pit 1 would be partially backfilled and reclaimed into a post-mine lake (PML). The PML is the result of allowing groundwater and rainwater to fill in Pit 1. The reclamation plan requires partial backfilling and grading of the periphery of the lake to a condition that has been approved by OSMRE. Pit 2 would be completely backfilled. All disturbed land would be covered with topsoil and re-vegetated. A total of 3,929,000 compacted cubic yard (CCY) of material is required to be removed from the temporary spoil piles and used to fill the two pits in accordance with the approved reclamation plan. The balance of the material left in the spoil piles would be graded, topsoiled, and planted with Douglas fir. Twenty-one acres along the southwest edge of Spoil Pile 1 have been fully reclaimed.

In 1999, PCCC began disposing of new sources of fill from off-site construction sites and sand and gravel washing operations. These included silt from sedimentation ponds, silt from dewatering systems, and excavated native soils. OSMRE determined external fill disposal was a surface mining activity because it impacted mine reclamation. OSMRE's jurisdiction was affirmed through a series of administrative law proceedings. Through a December 15, 2000, permit revision order (OSMRE 2000), OSMRE required PCCC to gain approval of each new source of clean fill via a minor permit revision application that included sampling and testing prior to disposal. OSMRE required that PCCC test for the following parameters before it would allow disposal from a new source (Table 1).

Table 1. Chemical and Physical Test Requirements for External Fill Approval

Required Tests	
Potassium	Acid-Base Potential
Calcium	Neutralization Potential as Calcium Carbonate (CaCO3)
Magnesium	Sulfur, Total
Sodium	Texture by Hydrometer
Chloride	Clay
Acid Generation Potential	Sand
Acid Neutralization Potential	Silt
Texture Classification	

The order also required PCCC to add monitoring and reporting requirements for the disposal of off-site fill into the PAP. These included a requirement to sign individual truck trip tickets showing the amount of material hauled, the origin of the material, the time and date the material was brought in and to submit monthly reports to OSMRE that summarize the amount of material accepted.

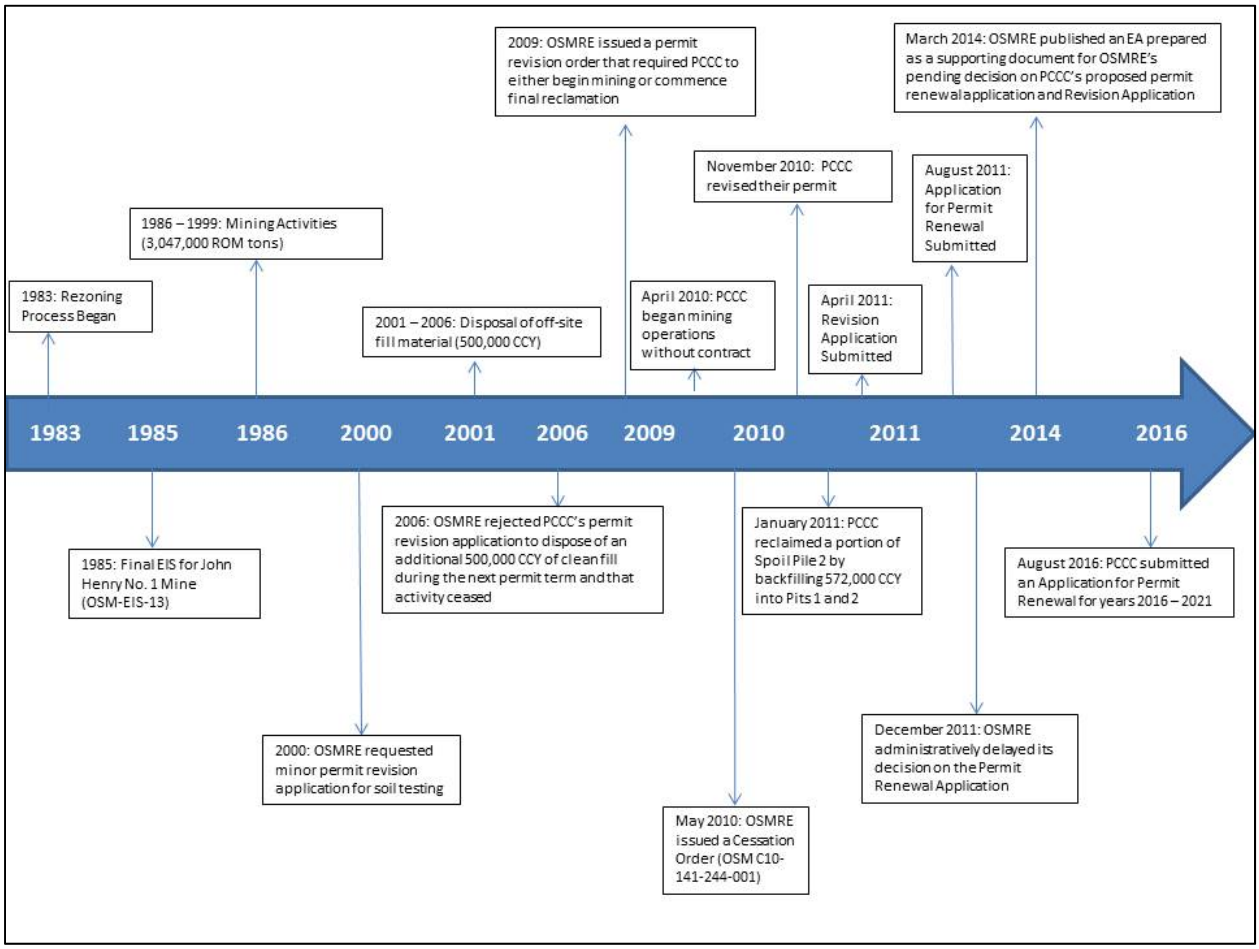
OSMRE authorized a total disposal amount of 100,000 CY average per year for the 2001 to 2006 5-year permit term for a total of 500,000 CY. From 1999 to 2006, PCCC received approximately 644,000 CY of off-site fill for backfill applying it at the east end of Pit 1. In 2006, OSMRE rejected PCCC's permit revision application to dispose of an additional 500,000 CY of clean fill during the next permit term. Backfill of off-site fill material ceased at that time. OSMRE concluded that additional disposal conflicted with reclamation plans because it would have increased the backfill volume by 13.9 percent, and that additional disposal conflicted with the purpose of SMCRA.

In April 2009, OSMRE issued a permit revision order that required PCCC to either begin mining or commence final reclamation according to the reclamation plan in the PAP (OSMRE 2009). In that same permit revision order, OSMRE required PCCC to demonstrate that it had a market for its coal, through evidence of a sales contract, before it would approve additional mining. OSMRE issued a Cessation Order on May 24, 2010 (OSM C10-141-244-001) directing PCCC to cease mining operations and to revise its permit to move forward with final reclamation. The permit was revised and in the fourth quarter of 2010 and January 2011 PCCC reclaimed a portion of Spoil Pile 2 by backfilling 572,000 CY of fill into Pits 1 and 2.

PCCC's current plans are to renew its surface coal mining permit to allow mining to continue in accordance with the proposed permit revision application submitted on April 18, 2011. SMCRA Section 506 provides a surface coal mining operator the right to successively renew its existing, approved surface coal mining permit. In accordance with the requirements of 30 CFR 774.15, PCCC submitted a permit revision application on April 18, 2011 and an Application for Permit

Renewal of Surface Coal Mining and Reclamation Operations at John Henry No. 1 Mine to OSMRE on August 4, 2011. PCCC's surface coal mining permit (Federal Permit, WA-0007D) was scheduled to expire on December 7, 2011. On December 4, 2011, OSMRE notified PCCC that it administratively delayed its decision on the permit renewal application and that PCCC was permitted to continue activities under the currently-approved permit until OSMRE made a decision on the permit revision application and permit renewal application. On August 3, 2016, PCCC submitted an application for permit renewal for years 2016 – 2021. Both the 2011-2016 and the 2016-2021 permit renewal applications are administratively delayed pending a decision on the permit revision application (*see* Figure 3 for a project timeline).

Figure 3. John Henry No. 1 Mine Timeline



1.2 Purpose and Need

The purpose and need of the Proposed Action is established by SMCRA, which requires the evaluation of PCCC's Application for Permit Revision and Application for Permit Renewal before PCCC may continue coal removal operations at the John Henry No. 1 Mine. OSMRE is the regulatory authority that administers Federal Mine Permit WA-0007D. As the regulatory

authority, OSMRE must evaluate the environmental effects resulting from the Proposed Action. OSMRE must decide whether or not to approve a Permit Revision Application and must decide whether or not to approve an application to renew Federal Mine Permit WA-0007D. The need for this action is to provide PCCC with the opportunity to exercise its valid existing rights to access and mine coal reserves located within the John Henry No. 1 Mine.

PCCC submitted a permit revision application for the John Henry No. 1 Mine, Federal Permit No. WA-0007D, dated April 18, 2011 (PCCC 2011a). OSMRE determined that the permit revision application was administratively complete on April 28, 2011 and began a technical review of the application. PCCC submitted a permit revision application to resume mining because coal reserves have become economically recoverable due to changes in market prices that improved PCCC's competitive position in the regional coal marketplace. Under PCCC's current permit, additional removal of coal is not allowed and only reclamation activities may be conducted.

Under SMCRA, OSMRE is required to make a decision to approve or deny the permit revision application and application for permit renewal. OSMRE determined that the permit revision application should be designated as a significant permit revision and that an EA was required under the NEPA. Factors considered in OSMRE's determination that the permit revision application would require an EA included changes in coal production, public interest in the operation, and resumption of blasting operations. This EA analyzes the impacts that would result under the alternatives presented and pursued (*see* Sections 1.3, 1.4, and 1.5).

1.3 Proposed Action Alternative

The Proposed Action Alternative would be continuation of mining at the John Henry No. 1 Mine and renewal of the John Henry No. 1 Mine surface coal mining permit. Active mining operations would produce an estimated 84,000 short tons of saleable coal per year. Reclamation activities would follow until the mine site was fully reclaimed and final bond release was authorized by OSMRE. A map showing the mining site and mine plan is provided as Figure 2. The permit area of the Proposed Action is within the currently approved permitted area (480 acres).

Under the Proposed Action, most mining would occur in two coal seams within Pit 2. All proposed mining activities would occur entirely within the Rock Creek/Lake Sawyer watershed with no mining activities proposed within the Lake No. 12 watershed. The reclamation plan that PCCC proposes is similar to that analyzed in the 1985 FEIS (OMSRE 1985). The exception is that the Mud Lake wetlands would not be mined and a replacement wetland would not be required (*see* Section 3.9, *Wetlands and Riparian Zones*). Overburden created from mining Pit 2 would be used to complete much of the backfilling requirements of Pit 1 in order to create a PML. Mining in Pit 2 would slowly advance to the west, as shown on Figure 2. 1,454,000 CCY of material in Spoil Piles 3N and 3S would be backfilled into Pit 2 to accomplish AOC of the two spoil piles and of Pit 2. 1,049,000 CCY from Spoil Pile 2 would also be used to fill in Pit 2. 782,000 CCY in Spoil Pile 1 would be used to complete backfilling the east end of Pit 1.

1.3.1 Mining Method

Under the Proposed Action Alternative, mining operations would last approximately six years. A shovel, loader, or backhoe, blasting, and truck mining operation would be used for overburden removal. Overburden material would be used to backfill the eastern portion of Pit 1. Mining operations would be concentrated in Pit 2; however, the northwest portion of Pit 1 may also be mined. As Pit 2 is widened from the sub-crop northward, the spoil material would be removed and hauled to backfill Pit 1. The coal seam would be removed with front-end loaders or a backhoe. Mined coal would be delivered to an open pile storage area in front of the plant feed hopper. The coal would be fed to a crusher capable of handling 175 tons per hour. After crushing, the coal would be conveyed to the preparation plant where it would be cleaned and then transferred to a clean coal stockpile ready for transport. The coal-processing waste would be conveyed to a refuse bin and used to backfill the pits.

1.3.2 Blasting

Blasting would be conducted to reduce the overburden and inter-burden to a size that can easily be removed. Ammonium nitrate mixed with fuel oil (ANFO) would be used in each blast hole. Detonation would be completed with non-electric detonators and cast boosters by qualified contractors. In accordance with applicable regulations, a pre-blast survey would be conducted and the public notified of the blasting schedule. Blasting would be conducted in a controlled manner and in accordance with all applicable regulations to prevent damage to surrounding property.

1.3.3 Access and haul roads

The primary access road to the John Henry No. 1 Mine runs from the Black Diamond - Ravensdale Road to the mine office along the north side of Ginder Lake (*see* Section 3.9, *Wetlands and Riparian Zones*). It is a gravel road approximately 2,450 feet long which was previously used as a logging road. Because the road existed prior to mining operations, the road will remain in place after reclamation activities are completed.

Access to Pits 1 and 2 is by a road from the coal preparation plant. The road is constructed of on-site compacted soils and off-site sand and gravel. There is another road running from the raw coal storage area south and west to Spoil Pile 3. It is used for transporting raw coal from the pits to the coal preparation plant and as an access point to the Spoil pile 3 area. This road is constructed of compacted spoils.

Secondary access is provided by a previously existing roadway running from Highway 169 past Pond H2 to the primary road south of Spoil Pile 2. It is not used on a regular basis but could be used in the future for reconnaissance of area conditions. This road existed prior to mining operations and will remain in place after reclamation activities are complete.

1.3.4 Utilities

Existing utilities at the mine include septic system, electrical system, telephone system, and buried water routing systems (potable and fire control systems). There are buried transmission lines previously built along the access road to the facilities area that are owned by PCCC. Two ground-based step down transformers were installed to provide electricity to the coal preparation plant, office, and shop facility. One 300 KVA transformer provides 480-volt

electricity to the preparation plant and the other 75 KVA transformer provides 480-volt electricity to the office and shop facilities. No additional utilities, transmission lines, or substations would be required under the Proposed Action Alternative.

1.3.5 Mine Facilities

Existing buildings, structures, and facilities include:

- Coal processing plant and coal storage areas
- Shale crushing & screening facility
- Explosive storage area
- Bulk ANFO storage area
- Guard house
- Truck wheel wash
- Office and office trailer
- Shop
- Oil storage trailer
- Wash-down station
- Parts trailer
- Well and pump house
- Water storage tanks (3)
- Fire control system
- Potable water system
- Shale storage facility
- Trucks scale facility
- Scale house
- Pre-existing concrete structure near Ginder lake

Mining equipment proposed for this small-scale operation is readily available to PCCC and/or contractors and will be brought on site as needed. Mining equipment would include but is not limited to:

- 2 front end loaders
- 1 overburden drill
- 1 dozer
- 1 backhoe
- 1-3 trucks

PCCC has refurbished the coal processing plant and expects that the mine can be back in operation within a few months of permit approval. No additional site development is required.

1.3.6 Ponds, Impoundments, Diversions

There are eight ponds (A, A' , B, F, G, H1, H2, I) at the John Henry No. 1 Mine. These ponds are used to control sediment runoff from spoil piles, disturbed areas, and backfilled areas prior to reclamation.

The truck wheel wash station has a closed-circuit sump which does not discharge. OSMRE's regulations for impoundments at 30 CFR § 816.49(b) apply to this structure.

1.3.7 Water Source

The John Henry No. 1 Mine uses a groundwater well as a source of potable water. The water supply system consists of a well pump, wellhead facilities (i.e. pump house), water line from wellhead to office and change house, booster pump station and storage tank, and pressure tank and controls. All systems and appurtenances are designed, constructed, and maintained in accordance with Chapter 248-54 WAC (Public Water Systems).

Approximately 85 gallons per minute of water are used during operation of the coal processing plant. Water is pumped from Pit 2, supplemented with water from pond G or from Ginder Lake when necessary. Water for fire protection (10,000 gallons) is stored in surface tanks at Spoil pile 1.

1.3.8 Hazardous Materials and Solid Waste

All greases, lubricants, paints, and flammable liquids would be disposed of through a commercial recycling service. Old mining equipment is sold or scrapped by local salvage operations and other solid wastes are disposed of at approved landfills. PCCC has developed a spill control and solid waste disposal plan as a condition of the National Pollutant Discharge Elimination System (NPDES) permit (No. WA 003083-0).

The only potentially combustible material to be disposed of on site is the coal processing waste. No coal processing waste would be placed on an exposed coal seam in the pit showing any signs of oxidation or burning. Coal processing waste would be covered with at least 4 feet of spoil to seal off sources of oxygen and to eliminate any potential for combustion.

1.3.9 Mine Personnel

Under the Proposed Action, the mine would employ 30 full-time workers for up to six years and 20 full time workers for an additional year of reclamation activities after mining ceases.

1.3.10 Coal Destinations

During the 1986-1999 mining period PCCC sold most of its coal to cement producers in Western Washington. Under the Proposed Action Alternative, PCCC would sell its coal to existing cement and lime producers in British Columbia, Canada, and Western Washington. It is anticipated that PCCC would sell approximately 60% of planned coal production to the Lehigh Cement plant located in Delta, British Columbia under its current contract which expires in 2019 (PCCC 2015b). The remaining 40% of planned coal production would *likely* be sold to *buyers including* the Ash Grove plant located in Western Washington*, an existing lime kiln, and a pulp mill. These plants currently purchase coal from producers with whom PCCC competes and are not directly linked to PCCC.* Typical cement and lime plants use a combination of coal, natural gas, petroleum products, and used tires as fuel sources to create sufficient heat in the kiln to produce a cement clinker (Kosmatka, Kerkhoff, and Panarese 2003) which is pulverized and processed into various cement products that are used in domestic, commercial, and industrial construction projects.

The process of making cement and lime is similar in that both require that limestone be crushed and blended with mineral additives then heated at approximately 1,500 degrees Fahrenheit to create a cement clinker product.

1.3.11 Transportation

Under the Proposed Action Alternative, there are two transportation scenarios. The first scenario would entail approximately 10 roundtrips per day by truck transporting materials to the Seattle or Tacoma, Washington area five days per week for six years. The second scenario would be a combination of truck and barge transportation to ship coal to the Lehigh Cement Plant in Delta, British Columbia. Approximately 82 roundtrips by truck would occur within a 36-hour period to transport materials to the Port of Seattle or Tacoma for loading onto a barge once each year for six years. The barge would travel through Puget Sound docking at the Port of Richmond, British Columbia where materials would then be transferred to trucks and driven approximately 10 miles to the plant in Delta, British Columbia. The exact trucking method from the Port of Richmond to Delta, British Columbia is unknown; however, it is assumed for purposes of this EA to be similar to those actions in the United States.

1.3.12 Reclamation

The approved reclamation plan requires the complete backfilling of Pit 2, and partial backfilling of Pit 1 to create a PML. At the completion of mining a portion of each spoil pile is backfilled and the balance is graded to blend with surrounding topography and meet AOC standards. The post mining land use would continue to support forestry for the upland area and fish and wildlife habitat for the lake and riparian area.

As mining advances to the west, mined overburden would be transported directly into Pit 2. Upon completion of all mining, a portion of each spoil pile would be backfilled into the pits and all disturbed areas (including spoil piles) reclaimed. Additionally, the 25.2 acres of mine facilities would be reclaimed upon completion of mining in accordance with the approved plan.

1.4 No Action Alternative

NEPA and the Council on Environmental Quality (CEQ) regulations require that a No Action Alternative be presented in all environmental analyses to serve as a baseline from which to compare all proposed action alternatives pursuant to 40 CFR § 1502.14(d). Under the No Action Alternative, the proposed permit revision application to resume and complete mining would not be approved. PCCC would commence final reclamation of the mine site, including the backfill of Pits 1 and 2 according to the reclamation plan in the currently approved PAP, estimated to take two years (*see* Section 1.3.12, *Reclamation*). The mine would employ 20 full time workers for reclamation activities. Additional coal reserves (737,000 tons) would not be mined and an additional 29.7 acres of mature, deciduous forest would not be disturbed. Under the No Action Alternative, there would continue to be surface disturbance as reclamation actions are completed in accordance with the approved reclamation plan.

1.5 Other Alternatives Considered But Not Evaluated

Under NEPA's requirements, the agency must evaluate the environmental impacts of a reasonable range of alternatives that meet the project purpose and need. The DOI's NEPA implementing regulations define reasonable alternatives as those that are "technically and economically practical or feasible and meet the purpose and need of the proposed action" (43 CFR § 46.420). After reviewing the current status, permit and compliance history, and the current permit revision application of the John Henry No. 1 Mine, OSMRE determined that there are no other reasonable alternatives to evaluate in this EA other than the Proposed Action Alternative and No Action Alternative.

2.0 PUBLIC COMMENTS AND IDENTIFIED ISSUES

Public comments on the Proposed Action Alternative were solicited from the general public on the April 18, 2011 permit revision application and surrounding communities via public notice as required under 30 CFR § 947.774.13 for the permit renewal and significant revision. OSMRE received one comment letter from a citizen of Black Diamond regarding PCCC's permit renewal application. All concerns expressed by the public on the 2011 permit revision application have been addressed by OSMRE in either this EA or OSMRE's Cumulative Hydrologic Impact Assessment (CHIA) (OSMRE 2016). OSMRE received an Application for Permit Renewal for 2016 – 2021 on August 3rd, 2016.

In reviewing the permit revision application, OSMRE coordinated with other Federal, state, and local agencies. One response was received from the Mine Safety and Health Administration (MSHA) related to PCCC's ground control plan. MSHA concluded that the changes proposed are minor in scope. It also noted that PCCC must monitor and inspect the PML to ensure compatibility with the approved ground-control plan. On June 28, 2011, PCCC met with OSMRE and the United States Army Corps of Engineers (USACE)*, at which time the USACE* who requested an updated wetlands delineation study. The study (Group Four 2011) was prepared by a third-party consultant and submitted to the USACE along with PCCC's Pre-Construction Notice (PCCC 2011b). As part of the permit revision application review process, the City of Black Diamond submitted additional comments on the Proposed Action Alternative that sought clarification related to water quality, traffic, and land-use issues. PCCC would not mine coal within the Black Diamond city limits but would conduct reclamation work within the city limits while reclaiming spoil piles 3 North and 3 South to AOC. PCCC would conduct reclamation within the Black Diamond city limits under both the Proposed Action Alternative and the No Action Alternative. PCCC responded directly to the City of Black Diamond to address those concerns. Black Diamond officials are requiring PCCC to obtain a grading permit issued by the City of Black Diamond prior to any disturbance and reclamation of spoil piles located within the city limits. These two spoil piles would be reclaimed in accordance with the approved reclamation plan in the permit (PCCC 2011a). In response to the City of Black Diamond's comments and requirements, PCCC applied for a grading permit which was issued on October 24, 2014.

On March 18, 2014, OSMRE published an EA to support OSMRE's pending decision on PCCC's proposed permit renewal application and permit revision application. The availability of the EA was published in local media during March and April. Public comments were solicited *through* May 13, 2014. OSMRE received over 2,300 comments from the public on the 2014 EA, indicating strong public interest.

OSMRE's review of the public comments identified several resource-specific concerns. These are addressed in this revised EA. Comment concerns included, but were not limited to, the following:

1. Groundwater and surface water quality and quantity;
2. Transportation of coal over public roads;

3. Air quality and public health;
4. Blasting effects;
5. Noise;
6. Devaluation of surrounding properties;
7. Historic non-mining waste disposal;
8. Climate change;
9. Species of concern;
10. Cumulative impacts.

On September 18, 2017, OSMRE published an EA and unsigned Finding of No Significant Impact (FONSI) to support OSMRE's pending decision on PCCC's proposed permit renewal application and permit revision application. The availability of the EA was published in the Voice of the Valley on September 18, 2017 and public outreach letters as well as an e-mail notification were sent out to interested parties. Tribal notification letters were mailed to seven Tribes with potential cultural and historic ties to the project area. Public comments were solicited through October 17, 2017. OSMRE received over 1,500 comments from the public. Responses to those comments are included as Appendix G to this EA. OSMRE made a project website available that provided project information and comment opportunities located here: https://www.wrcc.osmre.gov/initiatives/johnHenryMine.shtm.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section provides an overview of the current conditions and pertinent elements of the affected environment and examines impacts of the Proposed Action Alternative and the No Action Alternative‘

The specific resources examined as part of this EA are listed below in Table 2.

Table 2. Environmental Resource Areas Addressed

Resource Areas	
Topography	Land Use
Geology (Paleontology)	Socioeconomics and Environmental Justice
Water Resources/Hydrology	Transportation
Climate and Climate Change	Recreation
Air Quality	Noise and Vibration
Soils	Visual Resources
Vegetation	Cultural Resources
Wetlands	Human Health and Safety
Fish and Wildlife	

The affected environment associated with the resources examined in this EA were defined as being located within the mine permit area or the local area surrounding the mine as defined by the specific resource (i.e. biological or water resources). With the exception of climate change, air quality, and transportation, impacts were not evaluated on a regional or statewide level, given the limited area of mine operations.

Within each resource area, the type and duration of potential impacts (direct, indirect, and short-term or long-term) as well as potential impact intensity (negligible, minor, moderate, and *significant*) were evaluated. 40 CFR §§ 1508.8 and 1508.27. Section 3.21, *Summary of Impacts to the Affected Environment under the Proposed Action Alternative*, provides detail regarding the impact intensity metrics. Cumulative impacts are analyzed separately in Chapter 4.

Type of Impact:

- Direct impacts are defined as those impacts that are caused by an action that occur at the same time and in the same general location as the action. 40 CFR § 1508.8(a).
- Indirect impacts are those that are caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable. 40 CFR § 1508.8(b).

Duration of Impact:

- Short-term impacts refer to those impacts that generally occur over a short period during a specific point in the mining process and these changes generally revert to pre-

disturbance conditions at or within a few years after the ground disturbance has taken place.
- Long-term impacts are those that substantially would remain beyond short-term ground disturbing activities. Long-term impacts would generally last the life of the mine and beyond.

Intensity of Impact:

- Negligible impact is defined as impacts in the lower limit of detection that potentially could cause an insignificant change or stress to an environmental resource or use.
- Minor impact is defined as impacts that potentially could be detectable but slight.
- Moderate impact is defined as impacts that potentially could cause some change or stress to an environmental resource but the impact levels are not considered significant.
- Significant impact is defined as impacts that potentially could cause irretrievable loss of a resource; significant depletion, change, or stress to resources; or stress within the social, cultural, and economic realm.

The impact analysis presented in this EA generally does not imply or assign a value or numerical ranking to impacts except in cases where numerical quantification is possible such as hydrology, air quality, and noise. Impacts that result from, or relate to, the implementation of any of the alternatives are analyzed in this chapter.

3.1 Regulatory Framework

Different federal, state, and local jurisdictions are responsible for the regulation of resource areas. Applicable statutes, regulations licenses, and guidance are listed below.

- National Environmental Policy Act (42 U.S.C. § 4321 et seq.)
- Surface Mining Control and Reclamation Act (SMCRA) of 1977 (Public Law 95-87)
- Clean Water Act (33 U.S.C)
- Executive Order 11988, Floodplain Management
- Chapter 508-12, WAC, Administration of Surface and Groundwater Codes
- King County, Title 9, Surface Water, Storm Water, and Groundwater Management
- Clean Air Act (42 U.S.C. § 7401 et seq., as amended in 1977 and 1990)
- Washington Department of Ecology (WDOE), Guidance for Ecology Including Greenhouse Gas Emissions in SEPA Reviews
- Executive Order 11990, Protection of Wetlands
- Endangered Species Act (16 U.S.C. § 531)
- Migratory Bird Treaty Act (16 U.S.C § 703)
- Bald and Golden Eagle Protection Act of 1940 (16 U.S.C § 608)
- Fish and Wildlife Coordination Act of 1934 (16 U.S.C. § 661)
- Treaty of Point Elliot of 1855
- CEQ 1997: Environmental Justice Guidance under the National Environmental Policy Act

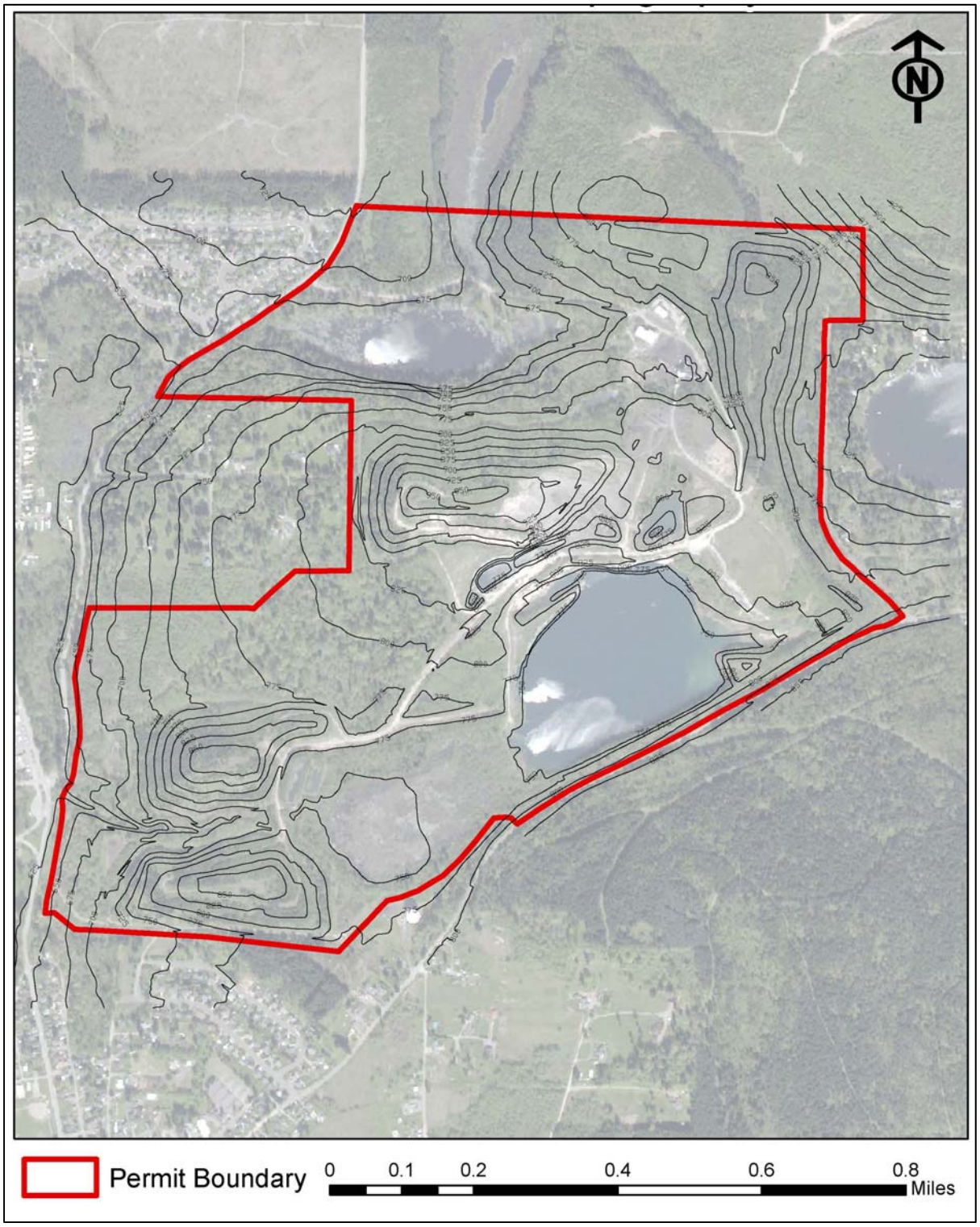
- Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. 59 Fed. Reg. 7629 (February 16, 1994)
- King County, Title 46, Traffic Code
- King County, Title 14, Roads and Bridges
- King County Grading Permit
- King County, Title 7, Parks and Recreation
- Noise Control Act of 1972 (42 U.S.C. § 4910)
- State of Washington, Department of Labor and Industries, Magazine Storage License
- City of Black Diamond, Business License
- Federal Communications Commission, Radio Station License
- State of Washington, Department of Licensing, Fuel Tax Section, Special Fuel Tax Bulk User License
- State of Washington, Department of Wildlife, Hydraulics Project Approval
- State of Washington, Department of Ecology, Permit to Appropriate Waters of the State of Washington
- Seattle King County Department of Public Health, Permit to Install/Repair Sewage Disposal System
- Occupational Safety and Health Administration, Occupational Noise Exposure Hearing Conservation Amendment (29 C.F.R. Part 1910.95)
- King County, Title 12, Public Peace, Safety and Morals, Section 12.86 Noise
- Manual H-8410-1, Bureau of Land Management, Visual Resource Inventory
- King County, Title 21A, Zoning
- National Historic Preservation Act (54 U.S.C. § 300101 et seq.) Section 106 (Public Law 102-575, 54 U.S.C. § 306108) and its implementing regulations (36 C.F.R. Part 800)
- Antiquities Act of 1906 (16 U.S.C. § 431 et seq.)
- Archaeological Resources Protection Act of 1979 (54 U.S.C. § 300101 et seq.)
- American Indian Religious Freedom Act of 1978 (Public Law 95-341)
- Archaeological and Historic Preservation Act of 1974 (Moss-Bennett Act)
- Executive Order 11593, Protection and Enhancement of the Cultural Environment
- Executive Order 13007, Indian Sacred Sites Native American Graves Protection and Repatriation Act (25 U.S.C. §§ 3001 to 3013)
- OSMRE NEPA Regulations, 43 CFR Part 46
- OSMRE NEPA Guidance, DOI 516 DM (DOI 2004)

3.2 Topography

3.2.1 Affected Environment

Surface elevations in the permit area ranged from a maximum of 840 feet above mean sea level to a minimum of approximately 625 feet above mean sea level where Mud Lake creek leaves the permit area. Ground elevations within the future mining area range from 750 to 825 feet above mean sea level. Construction of the temporary spoil piles increased the maximum elevation to 950 feet above mean sea level in those locations (Figure 4).

Figure 4. Topography of John Henry No. 1 Mine



3.2.2 Environmental Consequences

An additional 29.7 acres of land would be disturbed under the Proposed Action bringing the total disturbed area to 302.9 acres. During reclamation the disturbed areas would be backfilled and

graded to AOC, and reclaimed in accordance with the plan proposed in the Revision Application (PCCC 2011a).

3.2.2.1 Proposed Action Alternative

Potential direct impacts related to the final mine topography have been identified through consideration of PCCC's permit revision and renewal applications. Pit 1 would be reclaimed to a PML using overburden mined from Pit 2 and from stockpile material in Spoil Pile 1 and Spoil Pile 2. Pit 2 would be reclaimed to AOC by complete backfilling from Spoil Pile 2, Spoil Pile 3S, and Spoil Pile 3N. Because the topography would be reclaimed to AOC, this constitutes a direct, minor, and long-term impact within the permit area. Elevation would increase from 5 to 20 feet compared to pre-mining conditions in selected areas across the mine site as a result of the Proposed Action. Topographic impacts would be restricted to the mine permit area and would not result in any indirect impacts.

3.2.2.2 No Action Alternative

In terms of final topography, there is no difference between the Proposed Action Alternative and the No Action Alternative except for timing. Under the No Action Alternative, final reclamation of the mine site begins immediately and is completed in two years compared to seven years under the Proposed Action Alternative. The final post-mine configuration is the same as under the Proposed Action Alternative. Under the No Action Alternative, the relatively small existing void in Pit 2 would be filled with material from Spoil Pile 2. To achieve AOC of Spoil Pile 3S and Spoil Pile 3N and to partially fill Pit 1 to its approved configuration, spoil would be hauled to Pit 1. The amount of backfill in Pit 1 and lake depth would be the same in either the Proposed Action Alternative or the No Action Alternative. Elevation changes in selected areas from pre-mining conditions would increase from 5 to 20 feet under the No Action Alternative. The impact is within the permit area, and is direct, minor, and long-term. Topographic impacts would be restricted to the mine permit area and would not result in any indirect impacts.

3.3 Geology/Paleontology

3.3.1 Affected Environment

The coal seams are contained within the Eocene Puget formation. Coal is inter-bedded with shale, siltstone, and sandstone units. In Pit 2, overburden is predominantly sandstone. Vashon till generally overlays the entire property and ranges in thickness from 10 to 70 feet. This till is generally referred to as hardpan and must be ripped or blasted to gain access to the underlying bedrock. The underlying Eocene Puget formation in Pit 2 dips to the north from 25 to 45 degrees. The steepest dips are in the eastern end of Pit 2. Mining from 1986 to 1997 was focused in Pit 1. This was a large open pit that followed an anticline with an east-to-west axis. The strata dipped north and south approximately 45 degrees. In this pit, the Franklin No. 7, 8, 9, 10, and 410 seams were mined. Initial spoil from Pit 1 was placed in temporary spoil piles. Direct backfilling of Pit 1 began in 1992. This prior mining would allow for a quick development of remaining reserves in Pit 2 where the Franklin No. 12 seam is currently exposed. Plant fossils are abundant in the Puget formation shale and siltstone units and were observed during mining operations (Morris 2015). Additional mining of such shale and siltstone units are not anticipated under the Proposed Action Alternative. Overburden above the Franklin No. 12 seam is

predominantly sandstone that contains few plant fossils (OSMRE 1985, Morris 2015). Spoil material in the backfill and in the spoil piles consists primarily of the overburden units described above including Vashon till, sandstone, shale, and siltstone.

Geologic-related hazards in King County could include earthquakes, landslides, and volcanic activity. Earthquakes have historically occurred in Western Washington. The last major earthquake was in 2001 near Nisqually, Washington with a 6.8 earthquake on the modified Mercalli intensity scale (1.0 – 10.0) which is approximately 40 miles away from the City of Black Diamond (Pacific Northwest Seismic Network 2014). Landslides are most likely to occur during the rainy season, but can also occur as a result of earthquakes. They occur primarily on steeper slopes with unstable or loose soil conditions (WA DNR 2014). Two active volcanoes are present in the Cascade Mountain Range and associated hazards would be falling ash and mudflows resulting from an eruption.

3.3.2 Environmental Consequences

Vertebrate remains have not been noted in the past and are not expected to be uncovered by mining under the Proposed Action Alternative. In the event they are uncovered, PCCC would notify the Burke Museum at the University of Washington to conduct an investigation as prescribed in 36 CFR 800, *Protection of Historic Properties*.

According to U.S. Geologic Survey, the probability of an earthquake greater than 5.0 occurring in the vicinity of the City of Black Diamond in the next 20 years is 30% (USGS 2009). Slope conditions at the Mine would be steep in areas of active mining under the Proposed Action; however, measures would have already been taken to secure the area under the mining permit. According to a Washington Department of Natural Resources (WDNR) study, the area surrounding Maple Valley is in a low hazard zone from potential eruptions and would not experience adverse impacts related to mudflows or volcanic ash (Cakir and Walsh 2012). Therefore, potential impacts from geologic related hazards would cause temporary and negligible impacts to the Mine and the potential for occurrence at the Mine is very rare.

3.3.2.1 Proposed Action Alternative

Under the Proposed Action Alternative shale and siltstone overburden units that contain abundant plant fossils would be disturbed by mining of the additional acreage (29.7 acres). The removal and replacement of overburden and spoil would have moderate impacts to the properties, structure, and appearance. However, these changes would not result in a loss of scientific and educational values for geologic and paleontological resources. Therefore, the effect on the geology and paleontology, within the proposed mining area, is direct, moderate, and long-term. This is especially the case when compared to previous mining within the permit area where shale and siltstone were the primary overburden units and fossils were abundant. Geologic impacts would be restricted to the mine permit area and would not result in any indirect impacts.

3.3.2.2 No Action Alternative

Under the No Action Alternative, PCCC would not disturb additional geologic and paleontological features so there would be no additional impacts. Some fossil bearing material may be encountered in the external spoil piles which would be partially removed to achieve AOC. Overall impacts would be direct, negligible, and long-term. Geologic impacts would be restricted to the mine permit area and would not result in any indirect impacts.

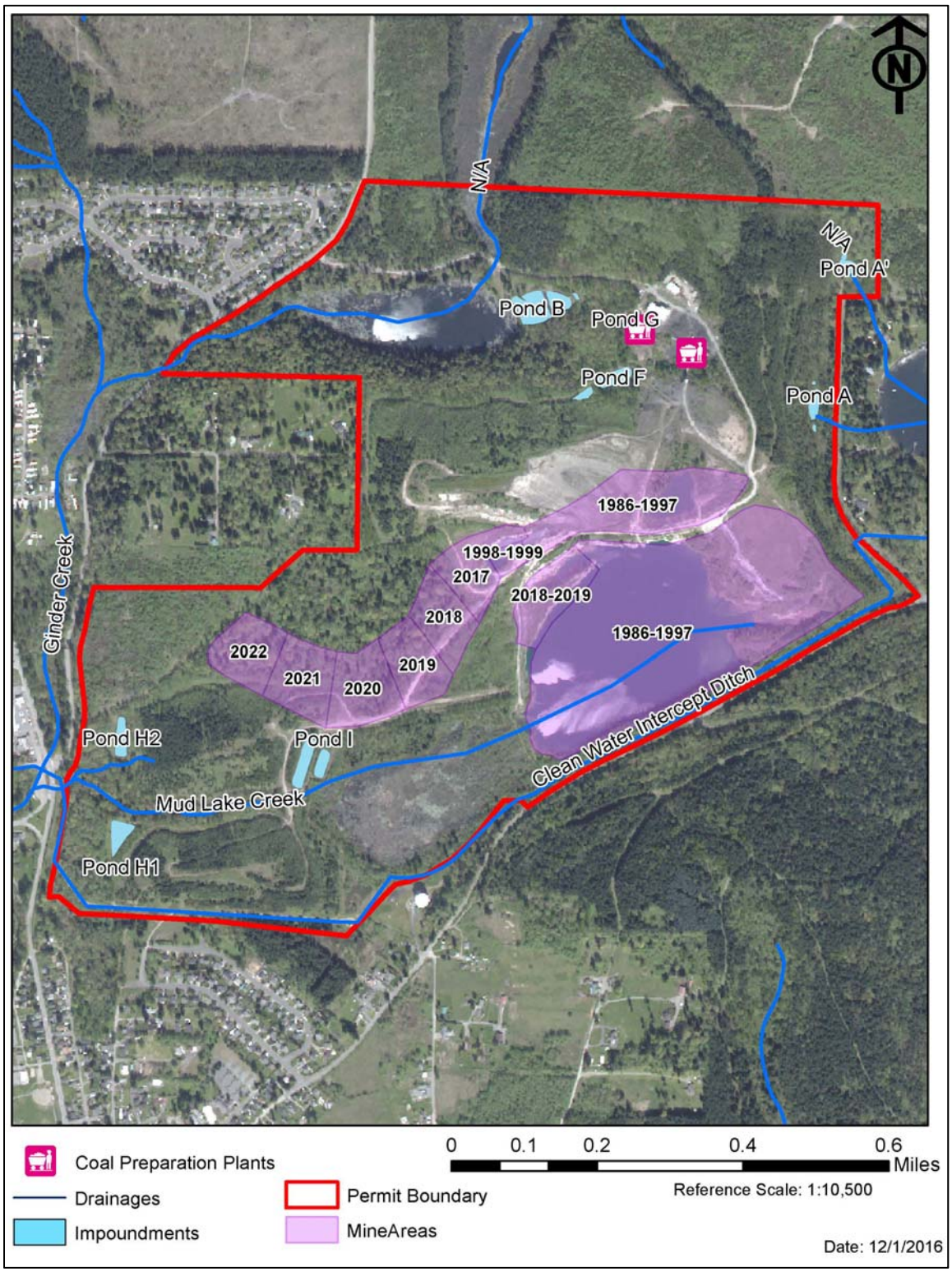
3.4 Water Resources / Hydrology

3.4.1 Surface Water

3.4.1.1 Affected Environment

The John Henry No. 1 mining area is located in three sub-watersheds: Ginder Lake, Mud Lake, and Lake No. 12. Ginder Lake and Mud Lake both drain to the west via correspondingly named creeks, flowing into Ginder Creek then to Rock Creek and then into Lake Sawyer. Lake 12 and Ginder Creek drainage areas have lost 13 acres (2.9 percent of pre-mine watershed area) and Mud Lake Creek drainage basin has gained 13 acres (increase of 3.5 percent of pre-mine watershed area) from previous mining activity. Figure 5 shows the location of surrounding water bodies, sediment control structures, water-monitoring locations, and major drainage structures. There are no wild and scenic rivers located within or adjacent to the permit area (National Wild and Scenic Rivers System 2016).

Figure 5. John Henry No. 1 Mine Surface Water Control System



All surface water runoff from disturbed areas of the mine is captured by drainage ditches and conveyed to one of several sedimentation ponds (Pond-B, F, G, I, A, A', H1, and H2) before

being discharged from the permit area at NPDES discharge points. Ponds B, F, and G discharge into Ginder Lake which then discharges into Ginder Creek and Ponds I, H1, and H2 discharge into Mud Lake Creek which discharges into Ginder Creek. Figure 5 illustrates prominent features in PCCC's surface water control system.

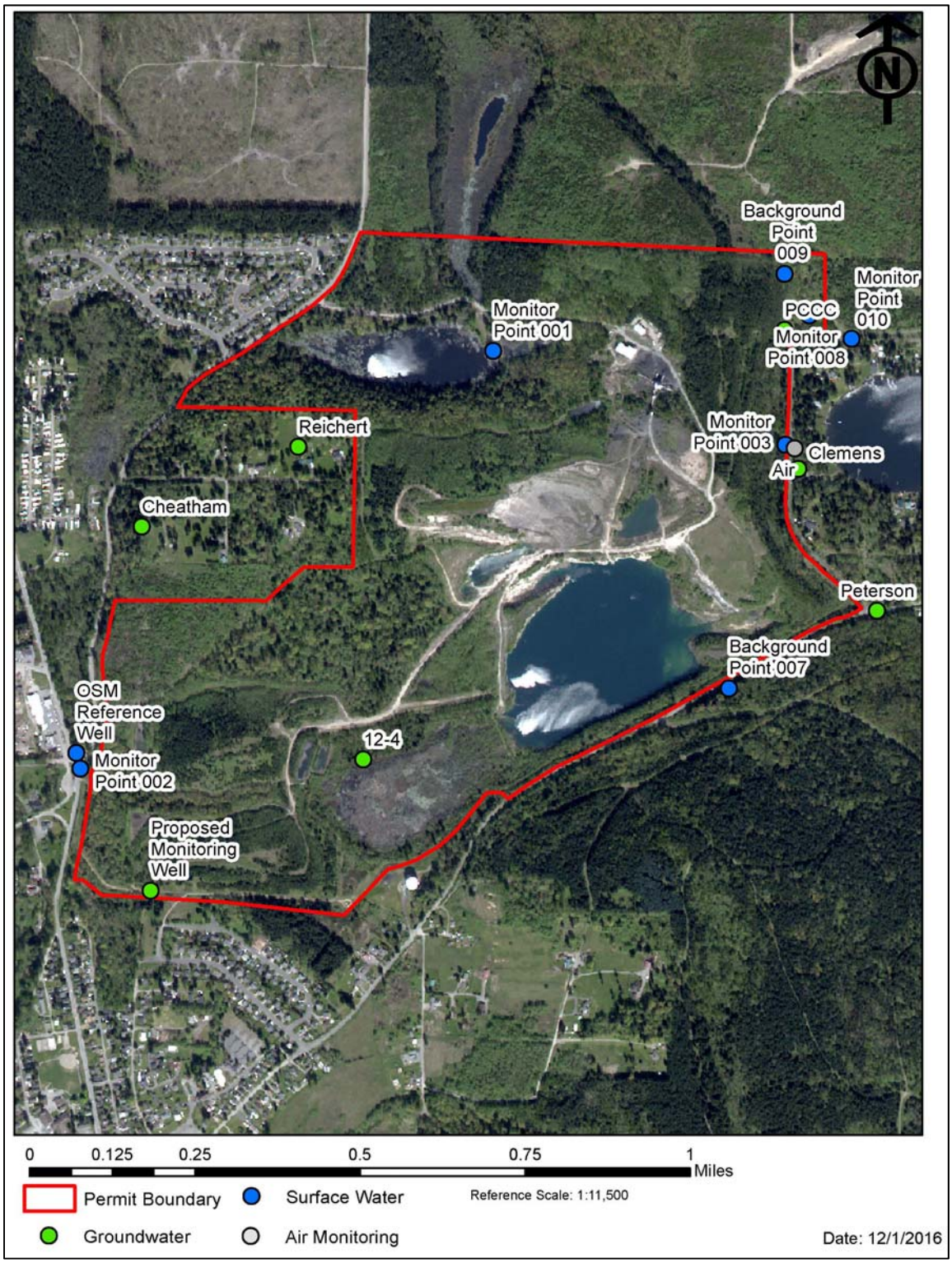
Surface water quality is monitored under sampling programs established by both OSMRE and Washington Department of Ecology (WDOE) through the OSMRE water-monitoring program and the NPDES permit (*see* Appendix B, *Water Resources*). NPDES permits are issued under the Clean Water Act by WDOE to regulate discharges and set numerical and other limitations on water quality to control pollution. From June 1992 through February 2008, OSMRE and WDOE programs both monitored surface water discharges at the mine. In March 2008, WDOE implemented a NPDES permit which required an event-driven sampling program. Under this program, discharge from each sediment pond on the active portion of the permit is sampled each month during the first two storm events with greater than 0.5 inch of rainfall (WDOE 2008) (*see* Appendix B, *Water Resources*). The A and A' ponds were removed from the NPDES permit in a modification dated December 28, 2012 and therefore are not included in the current surface water monitoring schedule. The 2012 NPDES permit is still in effect until WDOE approves a new permit or modification. *According to a letter from WDOE on October 17, 2017, "Prior to the start of any renewed mine operation, WDOE intends to write a renewed NPDES permit."* Table 3 shows the NPDES permit effluent limitations. Figure 6 shows the locations of the monitoring points.

Table 3. NPDES Permit Effluent Limitations

Parameter	Effluent Limitations
Phosphorus (6 Month Rolling Average)	41 µg/L (microgram per liter)
Phosphorus (Maximum Daily)	82 µg/L
pH	6.5-8.5
Turbidity	25 NTU
Dissolved Oxygen	Minimum 9.5 mg/L
Oil Sheen	No visible oil sheen
Hexavalent Chromium	15.3 µg/L
Copper	14.5 µg/L

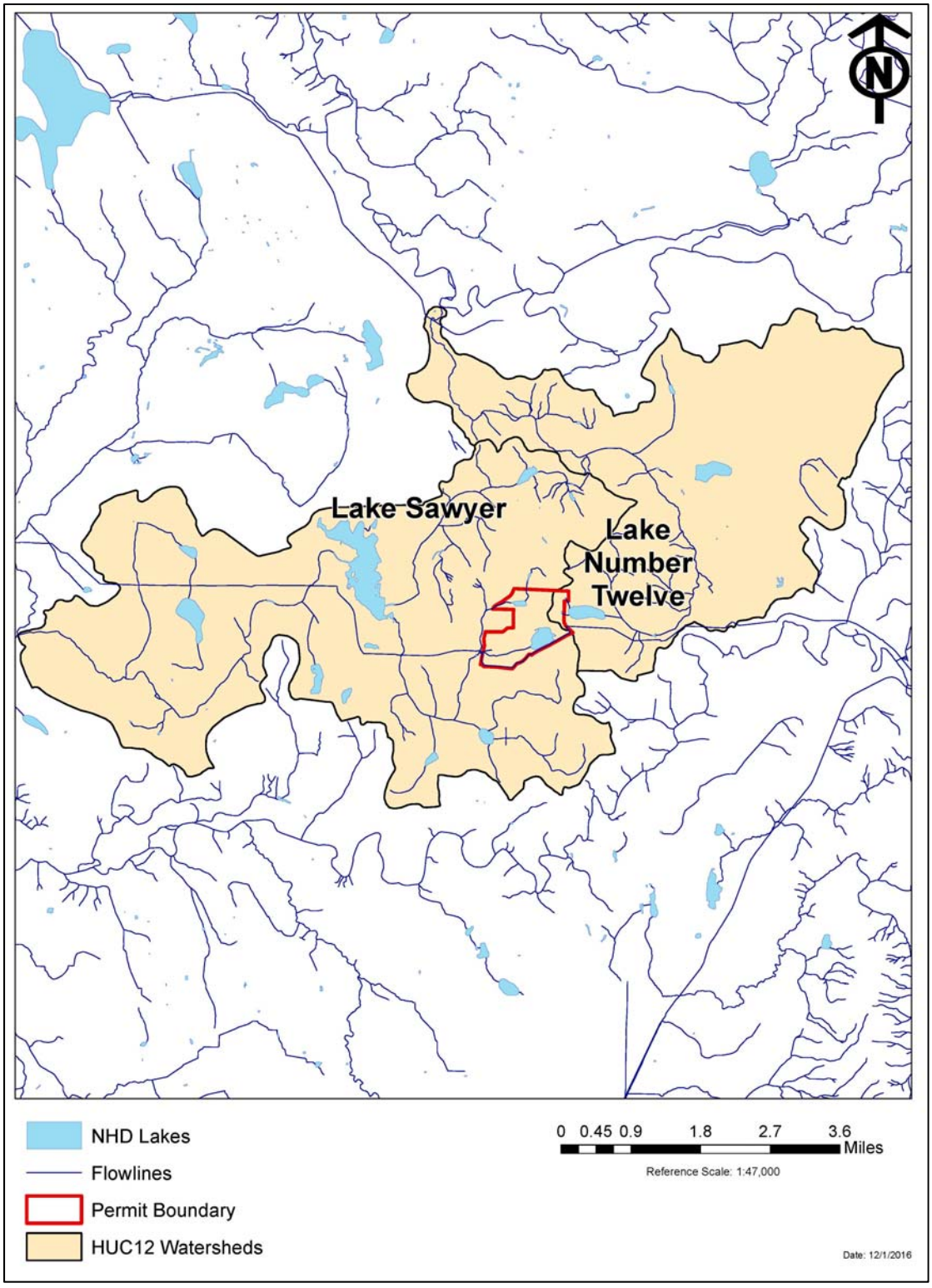
Source: WDOE 2008

Figure 6. OSMRE Water Monitoring Locations



There are two lakes located outside of the permit boundary: Lake No. 12 and Lake Sawyer. Lake No. 12 is situated just east of the permit area and discharges to the east through a wetland area, eventually flowing to the Green River. Lake Sawyer is a lake located within the City of Black Diamond limits and offers recreational and other values to the local community. It is approximately 280 acres in size and has an upstream watershed of 8,130 acres. The John Henry No. 1 Mine permit area occupies 480 acres or 6 percent of the total watershed area. The lake's primary inlets are Ravensdale Creek and Rock Creek which enter from the south and the main outlet is Covington Creek which drains to the west. Figure 7 shows the regional drainage and cumulative hydrologic impact area as determined by OSMRE in the 2016 CHIA.

Figure 7. Regional Drainage and Cumulative Hydrologic Impact Area



[1] For acronym definitions see LIST OF ABBREVIATIONS AND ACRONYMS

Lake Sawyer has had water quality problems since the 1970s related to eutrophication[2], with phosphorus thought to be the main cause. Naturally occurring phosphorus loading, in addition to the gradual urbanization of the area, prompted the WDOE in 1991 to conduct a study on the Lake and institute a Total Maximum Daily Load (TMDL) for phosphorus on the incoming streams. The TMDL was instituted to target a total phosphorus concentration no greater than 16 µg/L at Lake Sawyer.

Data representative of baseline conditions was provided in the 1984 CHIA and the 1984 Probable Hydrologic Consequences (PHC) for the John Henry No. 1 Mine (OSM 1984), *see* Table 4. Baseline surface water data were collected monthly from February to August 1982 at five monitoring stations. Surface and groundwater conditions in the permit area are similar to other areas in central Washington with very little total dissolved solids, low concentrations of iron and manganese, low trace metals, and low alkalinity. The following table provides data on the baseline surface water quality conditions in the vicinity of the mine.

[2] Excessive richness of nutrients in a lake or other body of water, frequently due to runoff from the land, which causes a dense growth of plant life and death of animal life from lack of oxygen (Merriam-Webster 2017).

Table 4. Baseline Surface Water Quality Data for the John Henry No. 1 Mine

Analyte	Minimum	Maximum	Average	Standard Deviation	n	Median	90th Percentile	95% Confidence Interval
Flow (cfs)	0	5.69	1.48	1.8	21	0.453	4.742	5.06
Temperature (degrees C)	6.7	20.5	12	4.5	25	11.2	20.2	20.9
pH	5.5	7.9	6.93	0.65	25	7	7.79	8.21
Conductivity (µmhos/cm)	32	195	113	51.7	24	129	172.5	215
Arsenic (mg/L)	0.002	0.005	0.0035	0.0021	2	0.0035	N/A	0.0077
Cadmium (mg/L)	0.001	0.002	0.0015	0.0007	2	0.0015	N/A	0.0029
Calcium (mg/L)	3	16.3	8.32	5.04	10	8.55	16.17	18.2
Chromium (mg/L)	0.01	0.01	0.01	0	2	0.01	N/A	0.01
Total Iron (mg/L)	0.17	2.1	0.5916	0.43	25	0.43	1.22	1.44
Dissolved Iron (mg/L)	0.05	0.78	0.28375	0.187	24	0.23	0.65	0.650
Lead (mg/L)	0.01	0.01	0.01	0	2	0.01	N/A	0.01
Magnesium (mg/L)	1.2	10.3	4.41	3.11	10	4.15	10.05	10.52
Total Manganese (mg/L)	0.01	0.31	0.05692	0.0711	25	0.03	0.182	0.196
Dissolved Manganese (mg/L)	0.002	0.03	0.0164	0.0107	5	0.02	N/A	0.037
Mercury (mg/L)	0.001	0.001	0.001	0	2	0.001	N/A	0.001
Potassium (mg/L)	0.03	1.5	0.753	0.416	10	0.85	1.46	1.57
Sodium (mg/L)	2.8	12	5.71	2.81	10	6	11.58	11.2
Zinc (mg/L)	0.005	0.01	0.0078	0.0021	6	0.008	N/A	0.012
Nitrate/Nitrite (mg/L)	0.43	2.9	1.325	0.864	10	1.14	2.85	3.019
Bicarbonate Alkalinity (mg/L)	12	170	58.8	49.1	10	53.5	162.1	155
TSS (mg/L)	2	96	10.5	18.7	24	5	16.5	47.1
TDS (mg/L)	46	130	85.4	30.5	9	88	130	145
Chloride (mg/L)	1	3	1.9	0.567	10	2	2.9	3.01
Sulfate (mg/L)	4	12	8.9	2.9	10	10	12	14.7

N/A = Not Applicable
Source: OSM 1984

The water quantity varies seasonally at the John Henry No. 1 Mine due to the precipitation patterns in the area. The highest average runoff occurs in January whereas the lowest tends to occur in September towards the end of summer (PCCC 2011a).

3.4.1.2 Environmental Consequences

Protective measures of surface water resources include limiting vegetation clearing and removal to only those areas immediately required for mining, re-establishing vegetative cover on disturbed areas as quickly as possible by grass seeding, tree planting and controlling runoff by implementing and following the approved Drainage and Sediment Control Plan (PCCC 2011a).

Sediment ponds are operated as detailed in the Drainage and Sediment Control Plan approved in the PAP (PCCC 2011a). Ponds are inspected regularly by PCCC personnel and OSMRE inspectors to ensure proper functioning. Sediment and water storage capacities are assessed annually to ensure ponds maintain their designed capacities.

3.4.1.2.1 Proposed Action Alternative

Impacts to surface water flows from the Proposed Action Alternative are estimated to be minor. The Proposed Action Alternative calls for removal of vegetation and mining-related disturbance to 29.7 acres which could result in short-term impacts by changing transpiration[3], infiltration, and runoff in the Mud Lake Creek drainage basin; however, the size of the drainage basin areas would not change.

Potential impacts to surface water quality from the Proposed Action Alternative would include increases in sediment load and possible increases in total suspended solids, bicarbonate alkalinity, calcium, magnesium, sodium, specific conductivity, sulfate, chloride, manganese, zinc, and total phosphorus. Treatment capabilities of sedimentation ponds have been improved by adopting a variety of enhancements to mitigate suspended solids and other water quality parameters. These enhancements include construction of sumps just before the ponds, adding WDOE approved polymers to aid in settling the sediment, placing gravel packs around the discharge standpipes to capture suspended solids, and, equipping discharge pipes with valves to control outflow volumes.

All sedimentation ponds have been designed to contain the 10-year, 24-hour storm event, and to reduce sediment load by providing sufficient detention time and volume to allow sediment to settle. The drainage control plan map is shown in Figure 5. *See* Appendix B, *Water Resources*, for figures representing water quality trends at John Henry No. 1 Mine associated with sediment loading, total suspended solids, and total phosphorus loading. Figures B-1 – B-6 presented in Appendix B shows a general downward trend of sediment and total phosphorus loading.

Although the potential effects of the Proposed Action Alternative on surface water quality will be greater compared to the recent period of inactivity, impacts are anticipated to be less than those experienced during prior periods of active mining. Reduced impacts are expected due to the small area of additional disturbance (29.7 acres), and to additional measures being

[3] the process where plants absorb water through the roots and then give off water vapor through pores in their leaves

implemented to control and treat surface water runoff. *See* Appendix B, *Water Resources,* for more detailed information on surface water quality data.

Impacts to surface water quantity as a result of previous mining and reclamation operations have been minor (*OSMRE 2016*). The dewatering of mine pits and pumping of water throughout the mine site impacts discharge into the Mud Lake Creek and Ginder Creek sub-watersheds. Both of these sub-watersheds discharge into Ginder Creek, which in turn discharges into Rock Creek and Lake Sawyer. The large-scale effects of runoff variations at the John Henry No. 1 Mine in the 1993-2015 dataset are minimal when evaluated against their effect in the local area. Consequently, the Proposed Action Alternative will result in a similar surface water quantity impact observed during the previous mining period and constitutes a minor and short-term impact.

Impacts to surface water quality would be minor and short-term, based on the metrics in Table 4 and the analysis of impacts during the previous active phase at the mine. Water quality exceedances at NPDES outfalls may sometimes occur, but regular exceedances are not anticipated.

Potential indirect impacts from the Proposed Action Alternative include coal dust deposition in the surface water regime from coal transportation outside the permit area. Wheel washes will be used prior to trucks exiting the permit area to reduce mud and dust on the roads. Coal truck beds will be covered to reduce coal particles which could in turn influence the surface water regime. Because the amount of coal being hauled under the Proposed Action Alternative is small (approximately 84,000 tons per year). Negligible indirect impacts to surface water resources are anticipated.

3.4.1.2.2 No Action Alternative

Similar to the Proposed Action Alternative, actions under the No Action Alternative may increase the sediment load and certain chemical parameters of the stormwater runoff. Impacts of the No Action Alternative on surface water quantity and quality could be greater than the Proposed Action Alternative in the short-term, as the volumes of material and distance for the material to be moved for reclamation would be greater over a much shorter period of time. These longer roads are not required under the Proposed Action Alternative. The reclamation plan would be implemented immediately upon disapproval of the proposed permit revision and year-round reclamation would commence. However, the long-term effects would be similar. Under the Proposed Action Alternative mining activities are generally confined within Pit 2 where water is retained in the Pit and would be pumped dry to facilitate mining. Nonetheless, impacts on surface water quality are expected to be minor and short-term for the No Action Alternative. Impacts on surface water quantity are expected to be minor and short-term. Indirect impacts to surface water resources from the No Action Alternative are not anticipated.

3.4.2 Groundwater

3.4.2.1 Affected Environment

Applicable water quality criteria used for comparison to historical datasets was based on NPDES permit and WDOE criteria listed in WAC-173-200-040 regarding groundwater quality guidelines for drinking water supplies. These drinking water standards adequately protect the use of the groundwater resource in the area. The current NPDES permit for the John Henry No.1 Mine indicates that exceedances of water quality criteria would result in increased monitoring until such time as the standards are met (WDOE 2012). Triggering limits for additional groundwater monitoring per the NPDES Permit are summarized in Table 5. No NPDES water quality violations have occurred for the mine regarding groundwater quality.

Table 5. Triggering Limits for Additional Ground Water Monitoring (NPDES Permit)

Parameter	Station Name			
	Reichert Well	PCCC Well	12-4 Well	Pit 2
pH	6.5 to 8.5			
Arsenic	0.05 mg/L	0.05 mg/L	0.122 mg/L	0.05 mg/L
Lead	0.05 mg/L	0.05 mg/L	0.05 mg/L	0.05 mg/L
Chromium	0.05 mg/L	0.05 mg/L	0.05 mg/L	0.05 mg/L
Mercury	0.002 mg/L	0.002 mg/L	0.002 mg/L	0.002 mg/L
Manganese	0.113 mg/L	0.135 mg/L	0.092 mg/L	0.05 mg/L
Visible Sheen	No Sheen	No Sheen	No Sheen	No Sheen

Source: WDOE 2008

Groundwater monitoring of wells within the permit and adjacent area has been conducted at the mine since 1986. Due to low hydraulic conductivity of saturated portions of the Puget Group, minimal impact on groundwater quantity has been observed throughout the life of the John Henry No. 1 Mine. The 1984 CHIA predicted small temporary drawdown of local wells in the adjacent area could occur due to mine dewatering activities as mining progressed through potential recharge areas. Original estimates indicated seepage into the mining pits was projected to be between 3 and 5 gallon per minute; however, during actual mining of the two pits visual observation indicates that the projections were overstated. Pit 1 was excavated to a depth of over 325 feet with only a few minor wet spots apparent on the pit walls and no measurable groundwater discharge into the mine pit.

Groundwater is currently monitored under sampling programs established by both OSMRE and WDOE through the NPDES permit (*see* Appendix B, *Water Resources*). WDOE requires monitoring of the water in Pit 2 as potential discharge to groundwater. OSMRE does not consider the water in the mining pits to be groundwater and therefore does not require monitoring.

Comparison to baseline metrics was completed to determine whether water quality constituents not addressed in WDOE groundwater criteria or the NPDES permit have exhibited increased concentrations. The only discernable impacts have been increases in calcium and sulfate over baseline metrics at the Reichert Well.

In the 2016 John Henry No. 1 Mine CHIA, groundwater quality data from Reichert Well, PCCC Well, 12-4 Well, and Pit 2 was evaluated to determine whether the mining operation had caused any historic impacts to water quality, specifically during years of active mining. The data collected at the three wells was compared to water quality criteria to determine impact designations (OSMRE 2016). In the baseline study conducted for the initial CHIA (Simons Li and Associates 1984), it was demonstrated that the groundwater conditions within the Puget Group are highly heterogeneous and a high degree of natural variability is present in terms of water quality parameter concentrations. To date, only short-term minor impacts to water quality attributable to mining and reclamation operations at the John Henry No. 1 Mine have been observed in any of the wells listed in the OSMRE or NPDES monitoring programs.

Baseline studies conducted for initial permitting efforts and environmental analyses indicate no regional aquifer present and that the glacial drift overlying the area limits groundwater movement and potential water supply development. The Puget Group bedrock, which underlies the John Henry No. 1 Mine and surrounding area, is described as having poor water-bearing characteristics and being a very heterogeneous aquifer, with generally poor permeability[4]. Groundwater quality in the area is characterized as relatively high pH (7.7-8.9), presumably due to high bicarbonate[5] concentrations of the marine deposits. PCCC's mining activities since 1986 indicate that there is not a significant, interconnected groundwater resource in the Puget formation within the permit area (OSMRE 2014). Groundwater occurrence is generally discontinuous, likely due to the low permeability of the Puget bedrock and reliance on secondary permeability for water transmission.

Since 2004, PCCC has monitored water quality in Pit 1 to determine if the water quality of Pit 1, once the PML is fully reclaimed, would comply with 30 CFR § 816.49(b)(2), which requires the quality of impounded water to be suitable on a permanent basis for its intended use. The intended use of the lake is fish and wildlife habitat. Projected water quality is discussed more fully in Section 3.5.8.1 of the PAP (PCCC 2011a). This information supports the determination

[4] The state or quality of a material or membrane that causes it to allow liquids or gases to pass through it (Merriam-Webster 2017).

[5] A bicarbonate is a salt containing the anion $HCO3^-$ (Merriam-Webster 2017).

that the water quality of the lake would be suitable for its intended use and would meet applicable State and Federal water quality standards.

Baseline groundwater data was provided in the Appendices of the 1984 PHC. The following table (Table 6) depicts summary statistics of bi-yearly data collected from four groundwater monitoring wells in 1982.

Table 6. Baseline Groundwater Quality Data for the John Henry No. 1 Mine

Analyte	Minimum	Maximum	Average	Standard Deviation	n	Median	95% Confidence Interval
Temperature (degrees C)	7.2	15	10.1	3.008	8	9.15	16.02
pH	6.2	8.9	7.71	1.19	8	7.9	10
Conductivity (µmhos/cm)	75	673	399	217	8	440	825
Arsenic (mg/L)	0.002	0.064	0.0177	0.031	4	0.0025	0.078
Cadmium (mg/L)	0.002	0.002	0.002	0.000	4	0.002	0.002
Calcium (mg/L)	3.2	60	19.07	27.3	4	6.55	72.6
Chromium (mg/L)	0.01	0.02	0.0125	0.005	4	0.01	0.022
Total Iron (mg/L)	0.04	33	7.04	12.3	8	1.105	31.1
Dissolved Iron (mg/L)	0.01	1.1	0.235	0.394	8	0.04	1.007
Lead (mg/L)	0.01	0.022	0.013	0.006	4	0.01	0.025
Magnesium (mg/L)	1.2	37	10.7	17.533	4	2.35	45.09
Total Manganese (mg/L)	0.006	0.52	0.113	0.182	8	0.035	0.469
Dissolved Manganese (mg/L)	0.005	0.03	0.0118	0.009	6	0.01	0.030
Mercury (mg/L)	0.001	0.004	0.00175	0.002	4	0.001	0.005
Potassium (mg/L)	0.6	6.7	2.87	2.66	4	2.1	8.1
Sodium (mg/L)	3	160	75.2	81.4	4	69	234
Zinc (mg/L)	0.019	0.58	0.299	0.397	2	0.299	1.07
Nitrate/Nitrite (mg/L)	0.06	4	2.03	2.78	2	2.03	7.49
Bicarbonate Alkalinity (mg/L)	22	390	280	174	4	355	622
TDS (mg/L)	57	630	339	234	4	335	798
Chloride (mg/L)	2	8	3.75	2.87	4	2.5	9.38

Analyte	Minimum	Maximum	Average	Standard Deviation	n	Median	95% Confidence Interval
Sulfate (mg/L)	1	6	3	2.44	4	2.5	7.8

Source: OSM 1984

Baseline groundwater conditions in the Puget Group were highly variable at locations around the Mine. All but one well exhibited slightly basic pH. Conductivity, TDS, total iron concentrations, hardness, and other analyte concentrations were variable. Results for toxic constituents were mostly at the MDL; however, a few instances of high arsenic concentrations were recorded.

3.4.2.2 Environmental Consequences

Historic groundwater data from Reichert Well, PCCC Well, 12-4 Well, and Pit 2 was evaluated to determine potential impacts from the Proposed Action Alternative. This analysis was conducted under the assumption that historical impacts documented from when the mine was previously active are an indicator of whether impacts would occur from the Proposed Action Alternative.

3.4.2.2.1 Proposed Action Alternative

Mining activities have had negligible impacts on groundwater quantity due to the low permeability of the bedrock. As presented in the CHIA, the only groundwater losses detected from the mining operation were at the PCCC well, which occurred when the mine was active (OSMRE 2016). The PCCC well is used for mine drinking water and mine water supply.

The data collected at the Reichert Well, PCCC Well, and the 12-4 Well was compared to WDOE drinking water and NPDES water quality criteria to determine impact designations. Exceedances of water quality criteria at the Reichert well from 1993 – 2011 were limited to iron in 2.9 percent of samples, mercury in 2.6 percent of samples, and for manganese in 4.2 percent of samples. Exceedances of water quality criteria at the PCCC well from 1993 – 2011 occurred with iron in 14.5 percent of samples, mercury in 2.6 percent of samples, and in manganese in 1.4 percent of samples. Exceedances of water quality criteria at the 12-4 well from 1993 – 2011 occurred with iron in 25.7 percent of samples, mercury in 2.56 percent of samples, and in manganese in 1.4 percent of samples. As such, a minor direct impact to groundwater quality is predicted from the Proposed Action Alternative.

Groundwater quality in an area adjacent to mining activity could potentially be affected from mining due to the addition of various chemical constituents from the increased surface area of spoil material. The process is dependent on the solubility of the minerals in the spoil. Water can more readily react with rock that has been physically crushed by the surface mining process than it can with undisturbed rock. The majority of the strata in the John Henry No. 1 Mine area are alkaline, which limits the potential for additional dissolved metals in groundwater.

Overall, the measured impacts to groundwater quality in the area surrounding the John Henry No. 1 Mine have been minor and short-term. To date, only short-term minor impacts regarding groundwater quality have been observed in wells listed in the OSMRE and NPDES monitoring programs based on the evaluation criteria in Tables 10-11. Under the Proposed Action Alternative direct impacts are confined within the permit area and would be minor and short-term for groundwater quality and negligible for groundwater quantity. Indirect impacts to groundwater are not anticipated because any impacts associated with the Proposed Action Alternative would be confined to the permit area.

3.4.2.2.2 No Action Alternative

The No Action Alternative would not have an additional impact on groundwater resources. Impacts would be similar to those associated with the Proposed Action Alternative, with the exception that the potential for groundwater impacts at the Reichert Well would be lower. Direct groundwater quantity impacts would be negligible, short-term, and confined within the permit area. Indirect impacts associated with the No Action Alternative are not anticipated because any impacts associated with the No Action Alternative would be confined to the permit area.

3.5 Climate and Climate Change

3.5.1 Affected Environment

The climate in the area is moderate with relatively cool summers and mild winters. Measurements at the mine since 1982 show average rainfall of about 51 inches per year. Most of the rain falls from mid-October until late April.

Carbon dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_2O) as well as other manufactured industrial pollutants are all greenhouse gases (GHGs) and can contribute to the greenhouse gas effect. These pollutants are characterized according to their global warming potential (GWP), a relative measure of how effective a gas is at trapping heat. For example, 1 unit of CO_2 has a 100-year global warming potential of 1, whereas, an equivalent amount of CH_4 has a 100-year global warming potential of 28-*36* (IPCC 2015).

GHG emissions occur at all stages in a coal's life cycle from coal mine construction and extraction to coal combustion. Under the Proposed and No Action Alternatives CO_2, CH_4, and N_2O GHGs were evaluated as million tons of carbon dioxide equivalents (CO_2e) using 100-year global warming potentials.

In 2008 Washington State passed RCW 70.235.020 to have the State limit emissions of greenhouse gases to achieve the following emission reductions for Washington State:
(i) By 2020, reduce overall emissions of greenhouse gases in the state to 1990 levels;
(ii) By 2035, reduce overall emissions of greenhouse gases in the state to twenty-five percent below 1990 levels;

(iii) By 2050, the state will do its part to reach global climate stabilization levels by reducing overall emissions to fifty percent below 1990 levels, or seventy percent below the state's expected emissions that year (Washington State Legislature 2008).

In 2014, King County Council committed to countywide GHG emissions reduction targets adopted as Countywide Planning Polices by the King County Growth Management Planning Council, to "reduce countywide sources of GHG emissions, compared to a 2007 baseline, by 25 percent by 2020, 50 percent by 2030, and 80 percent by 2050." (King County 2015c).

3.5.2 Environmental Consequences

Climate change analysis for the purpose of this EA includes quantification of direct and indirect greenhouse gas emissions (GHGs). Qualitative and quantitative evaluations of potential contributing factors are included where appropriate and practicable.

A protocol to estimate what is referenced as the "social cost of carbon" (SCC) associated with GHG emissions was developed by a federal Interagency Working Group (IWG), to assist agencies in addressing Executive Order (EO) 12866, which requires federal agencies to assess the cost and the benefits of proposed regulations as part of their regulatory impact analyses. The SCC is an estimate of the economic damages associated with an increase in carbon dioxide emissions and is intended to be used as part of a cost-benefit analysis for proposed rules. As explained in the Executive Summary of the 2010 SCC Technical Support Document "the purpose of the [SCC] estimates…is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO2) emissions into cost-benefit analyses of regulatory actions that have small, or 'marginal,' impacts on cumulative global emissions." Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 February 2010 (withdrawn by EO13783). While the SCC protocol was created to meet the requirements for regulatory impact analyses during rulemakings, there have been requests by public commenters or project applicants to expand the use of SCC estimates to project-level NEPA analyses.

The decision was made not to expand the use of the SCC protocol for this [INSERT NEPA DOCUMENT NAME] for a number of reasons. Most notably, this action is not a rulemaking for which the SCC protocol was originally developed. Second, on March 28, 2017, the President issued Executive Order 13783 which, among other actions, withdrew the Technical Support Documents upon which the protocol was based and disbanded the earlier Interagency Working Group on Social Cost of Greenhouse Gases. The Order further directed agencies to ensure that estimates of the social cost of greenhouse gases used in regulatory analyses "are based on the best available science and economics" and are consistent with the guidance contained in OMB Circular A-4, "including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates" (E.O. 13783, Section 5(c)). In compliance with OMB Circular A-4, interim protocols have been developed for use in the rulemaking context. However, the Circular does not apply to project decisions, so there is no Executive Order requirement to apply the SCC protocol to project decisions.

Further, the National Environmental Policy Act (NEPA) does not require a cost-benefit analysis (40 C.F.R. § 1502.23), although NEPA does require consideration of "effects" that include "economic" and "social" effects. 40 C.F.R. 1508.8(b). Without a complete monetary cost-benefit analysis, which would include the social benefits of the proposed action to society as a whole and other potential positive benefits, inclusion solely of an SCC cost analysis would be unbalanced, potentially inaccurate, and not useful in facilitating an authorized officer's decision. Any increased economic activity, in terms of revenue, employment, labor income, total value added, and output, that is expected to occur with the proposed action is simply an economic impact, rather than an economic benefit, inasmuch as such impacts might be viewed by another person as negative or undesirable impacts due to potential increase in local population, competition for jobs, and concerns that changes in population will change the quality of the local community. Economic impact is distinct from "economic benefit" as defined in economic theory and methodology, and the socioeconomic impact analysis required under NEPA is distinct from cost-benefit analysis, which is not required.

Finally, the SCC, protocol does not measure the actual incremental impacts of a project on the environment and does not include all damages or benefits from carbon emissions. The SCC protocol estimates economic damages associated with an increase in carbon dioxide emissions - typically expressed as a one metric ton increase in a single year - and includes, but is not limited to, potential changes in net agricultural productivity, human health, and property damages from increased flood risk over hundreds of years. The estimate is developed by aggregating results "across models, over time, across regions and impact categories, and across 150,000 scenarios" (Rose et al. 2014). The dollar cost figure arrived at based on the SCC calculation represents the value of damages avoided if, ultimately, there is no increase in carbon emissions. But the dollar cost figure is generated in a range and provides little benefit in assisting the authorized officer's decision for project level analyses. For example, in a recent environmental impact statement, OSM estimated that the selected alternative had a cumulative SCC ranging from approximately $4.2 billion to $22.1 billion depending on dollar value and the discount rate used. The cumulative SCC for the no action alternative ranged from $2.0 billion to $10.7 billion. Given the uncertainties associated with assigning a specific and accurate SCC resulting from [#] additional years of operation under the mining plan modification, and that the SCC protocol and similar models were developed to estimate impacts of regulations over long time frames, this EA quantifies direct and indirect GHG emissions and evaluates these emissions in the context of U.S. and State/County GHG emission inventories as discussed in Section [#] of the EA.

To summarize, this EA does not undertake an analysis of SCC because 1) it is not engaged in a rulemaking for which the protocol was originally developed; 2) the IWG, technical supporting documents, and associated guidance have been withdrawn; 3) NEPA does not require cost-benefit analysis ; and 4) the full social benefits of coal-fired energy production have not been monetized, and quantifying only the costs of GHG emissions but not the benefits would yield information that is both potentially inaccurate and not useful.

The GHGs associated with coal mining are carbon dioxide (CO_2) as a result of coal combustion, the use of heavy diesel equipment and transport; nitrogen oxides (N_2O) as a result of blasting; and methane (CH_4) released into the atmosphere as a result of coal mining and processing.

According to the National Climate Change Viewer, the State of Washington is expected to have regionally-specific impacts in future years as compared to historical data (*see* Table 7). Due to the limited duration of the Proposed (seven years) and No Action Alternatives (two years) it is not expected that full extent of the climate change impacts described below would be realized and would therefore not contribute or otherwise create impacts to the projects construction, operation, or reclamation activities. However, smaller scale weather events such as flooding or drought may occur during the life of mine and may require the need to consider different seed mixes during reclamation to account for the higher temperatures and increased precipitation levels. This change in reclamation would be re-evaluated before beginning reclamation activities and the Operator would consult with OSMRE if it resulted in changes to the approved reclamation plan.

Table 7. Washington State Climate Change Impacts

Variable	1950-2005	2050-2074	Change
Snow	3.9 inches	1.6 inches	- 2.2 inches
Temperature	56.5 °F	62.6 °F	+ 6.1°F
Precipitation	12.6 inches per month	13.0 inches per month	+ 0.4 inches per month

Source: USGS 2014

Lesser known climate change impacts are likely to have the following impacts in the Pacific Northwest (EPA 2016b):

Water and Snow

- Decreased water for irrigation, fish, and summertime hydropower production.
- Warmer winter temperatures and increased winter precipitation as rain are projected to reduce the winter snowpack.
- Increased flood risks to rivers that receive waters from both winter rains and peak runoff in late spring are expected.

Salmon

- Increased difficulties for migration and spawning due to increased winter floods, decreased summer stream flow, and increased water temperatures.

Forests

- Increased chance of forest fires, insect outbreaks, and diseases from rising temperatures, changes in precipitation, and reduced soil moisture.

- Decreased forest types and ecosystems at high elevations due to the inability to survive changing climatic conditions resulting in economic impacts to the timber industry.

Wildlife

- Potential for extinction of local populations and loss of biological diversity.

- Warming waters and ocean acidification threaten economically important marine species and coastal ecosystems.

- Increased algal blooms due to warmer water temperatures resulting in beach closures and declines in recreational shellfish harvests.

Coastal Flooding and Erosion

- Increased coastal erosion and beach loss due to rising sea levels.

- Increased landslides due to increased winter rainfall.

- Permanent inundation, especially in south Puget Sound around Olympia.

- Increased coastal flooding due to sea level rise, storm surge, and increased winter streamflow from interior and coastal watersheds.

Agriculture

- Longer growing season and higher levels of atmospheric carbon dioxide in the short-term which may be beneficial to crops.

- Reduced water availability for irrigation, higher temperatures, and changes in pests, diseases, and weeds which may harm crop yields in the long-term.

3.5.2.1 Proposed Action Alternative

3.5.2.1.1 Methane

As coal is produced and processed, it emits methane, a GHG. Per the Intergovernmental Panel on Climate Change (IPCC) guidelines, Northwest coal contains in-situ methane of approximately 0.08 cubic meters per metric ton (IPCC 2014, EPA 1996). It is unlikely that this entire amount will be emitted during mining and processing as some remains within the processed coal. But for the purpose of this analysis it is assumed that all would be emitted. CO_2e for methane ranges considerably depending on the time horizon over which it is viewed. Expected production under the Proposed Action Alternative is 84,000 short tons per year of coal. Thus 9,725 cubic meters of methane are emitted annually. A conversion factor of 0.016929 metric tons of CO_2e per cubic meter of methane is used to convert to CO_2e. This is

based on published guidelines (EPA 2014, IPCC 2014). Estimated annual methane-derived GHGs from coal mining and processing is thus estimated to be 165 metric tons CO_2e.

3.5.2.1.2 Coal Preparation Plant

The coal preparation plant consumed an average of 12 kilowatt hours (kWh) per ton processed when it operated from 1991 – 1998 (PCCC 2015a). Planned production under the Proposed Action Alternative is 84,000 short tons per year. At this rate the plant is estimated to consume 1,560,000 kWh of electricity per year. Entering this into WDOE's calculation worksheet for electricity use shows 64 metric tons of CO_2e emitted annually from electricity use at the coal preparation plant.

In addition to electricity consumption, the plant would use a front-end loader and a refuse haulage truck. The loader is expected to operate 1,000 hours per year and consume 10 gallons of diesel per hour or 10,000 gallons per year. The truck would operate 500 hours per year and consume 3 gallons per operating hour for an additional 1,500 gallons per year. This total of 11,500 gallons per year yields 118 metric tons of CO_2e when entered into the WDOE spreadsheet. Total CO_2e attributed to the plant is 182 metric tons.

3.5.2.1.3 Mining and Reclamation

Under the Proposed Action Alternative, PCCC would operate standard surface mining equipment including articulated trucks, a dozer, loader, grader, and excavator. Fuel consumption is estimated from the Caterpillar Performance Handbook (Caterpillar 2013). This provides annual diesel fuel consumption as shown in Table 8. The 177,700 gallons of diesel fuel results in 1,820 metric tons per year of CO_2e.

Blasting emits N_2O which is *265*-298 times more potent than CO_2 as a GHG (EPA 2016e). Based on past operating performance information, PCCC expects that 0.79 pounds of explosives (powder factor) would be consumed for every BCY of overburden blasted. As noted in Section 1 above, PCCC would blast 1,021,090 BCY of overburden per year. The 0.79 powder factor results in 806,661 pounds or 403 tons of explosives used per year.

PCCC expects that explosives will be predominately ammonium nitrate fuel oil mixture (ANFO). It is assumed that explosives would be a 50:50 blend of emulsions and ANFO. Emulsion explosives are waterproof and are often mixed with ANFO depending on drill hole conditions. Emulsions emit more N_2O per unit than ANFO. This mixture would produce 28.76 pounds of N_2O per ton of explosives used (Arnold et al. 2013). Applying these parameters and converting to metric units show 5.27 metric tons of N_2O emitted from blasting. This is 1,634 metric tons per year CO_2e using the 298x factor.

Once mining is completed and final reclamation begins, one 40,000 ton articulated truck and the 980 loader will not be required to complete remaining reclamation. Additionally, the HCR1500 drill will not be required as active drilling and blasting will not be occurring. During this phase of

operation the mine will consume 118,500 gallons and emit 3,137 metric tons of CO_2e as shown on Table 8.

Under the Proposed Action Alternative, coal is mined, processed, and transported to one of several potential users. These include three existing regional cement manufacturing plants, an existing lime kiln, and a pulp mill. PCCC has a contract to supply a portion of the total 84,000 tons of coal to one specific plant located in British Columbia. It will likely sell coal to other plants as well. These plants currently purchase coal from producers with whom PCCC competes and are not directly linked to PCCC.

PCCC may also sell coal to one of the other two cement plants, one lime kiln and one pulp mill that burn coal and are located in the region. Ash Grove Cement in Seattle has been an important customer for PCCC in the past and would likely buy coal from PCCC in the future according to PCCC. Ash Grove Cement and Lehigh Cement in Richmond, British Columbia would emit equivalent amounts of CO_2 from burning 84,000 tons of PCCC coal per year. Each plant has different fuel mixes including a variety of waste products. Ash Grove in particular is a major consumer of recycled tires as noted in their Air Operating Permit (PSCAA 2004). Each plant also consumes more than 84,000 tons of coal annually when operating at full production. This means that PCCC coal would be blended with coal from other coal producers. Under WDOE guidelines as noted above, it is unlikely that these existing coal consumers would be considered “New” sources of GHG emissions. However, for purposes of this EA, indirect emissions from consuming 84,000 tons per year of coal are quantified.

Indirect emissions include: trucking coal directly to a customer or to a barge loading facility; loading coal onto barges; hauling coal on barges to British Columbia; and, burning the coal in cement or lime kilns. To estimate CO_2e for transportation components, WDOE recommends that diesel fuel consumption for each activity be estimated and then applying the conversion factor built into the calculation model (WDOE 2011a).

3.5.2.1.4 Truck Haulage

Trucks would haul 84,000 tons of coal directly to the customer in case of the cement plant located in Seattle or lime kiln in Tacoma and to a barge loading facility in either Seattle or Tacoma for delivery. Mileage to either Seattle or Tacoma is 35 miles. Trucks would carry, on average, 32 short tons of coal for each trip. This results in 2,625 truck trips per year or 183,750 miles per year for the 70 mile round trip. For highway trucks, WDOE guidance and spreadsheet inputs vehicle miles traveled for Class 7 – 8 trucks. This results in an estimated 290 metric tons per year of CO_2e from truck transportation (WDOE 2011b).

3.5.2.1.5 Barge Loading

Direct loading with a front-end loader is typical and would cause the most emissions compared to a system using loaders and conveyors. Barge capacity is 4,000 tons which would be taken over 36 hours to load. This results in 21 barges per year and 756 hours of loading time

assuming all coal produced is transported via barge. The 980 Loader consumes 10 gallons per hour of fuel according to the Caterpillar Handbook resulting in 7,560 gallons of diesel consumed per year (Caterpillar 2013). With this input the WDOE spreadsheet shows 77 metric tons of CO_2e emissions for barge loading annually.

3.5.2.1.6 Barge Hauling

Estimated indirect emission would be barging 136 miles from Tacoma to Richmond, British Columbia, Canada where two cement plants are located. Barging from Seattle would be approximately 30 miles less than from Tacoma. For purposes of this analysis the higher number is used. As noted above, 21 barges per year each with 4,000 tons of coal would be shipped. The average fuel consumption for barges in the U.S. is 616-ton miles per gallon of diesel (Texas Transportation Institute 2007). Assuming the entire 84,000 tons are barged over the 136-mile distance results in estimated emissions of 203 tons per year CO_2e from this source. PCCC received input from one barge operator estimating average fuel consumption of 1,500 gallons per round trip (Island Barge and Tug 2015). At 21 round trips per year this is 31,500 gallons per year that is equivalent to 323 metric tons CO_2e per year from barging using the WDOE spreadsheet.

3.5.2.1.7 Coal Combustion

Indirect impacts occur from combusting 84,000 short tons of coal per year with heat content of 10,560 British Thermal Units per pound and 45% carbon content. Using WDOE guidelines and worksheet (WDOE 2011a), yields 167,769 *metric* tons of CO_2e emissions annually from coal combustion. This is the case regardless of which regional cement plant or other end user consumes the coal.

Table 8 summarizes estimated direct and indirect emissions of GHG under the Proposed Action Alternative.

Table 8. Summary of Direct and Indirect CO_2e Emissions Proposed Action Alternative

		Metric Tons CO_2e/y	
		Mining and Reclamation (years 1-6)	**Final Reclamation (year 7)**
Direct Emissions			
	Methane	165	
	CHPP (Electricity and Diesel)	66,709	
	Mining and Reclamation	4,816	
	Final Reclamation		3,137
	Total Direct	71,690	3,137
Indirect Emissions			
	Truck Transportation	290	
	Barge Loading	77	
	Barge Transport	323	
	Coal Combustion	167,769	
	Total Indirect	168,339	
Total		**240,110**	

Table 9. King County, WA GHG Emissions Inventory (2011)[1]

Industrial Sector	Tons (CO2e)
Fires - Prescribed Fires	1,232.8
Fires - Prescribed Fires	9,006.5
Fires - Wildfires	330.2
Fires - Wildfires	2,215.1
Mobile - Non-Road Equipment - Diesel	741,470.5
Mobile - Non-Road Equipment - Gasoline	398,805.5
Mobile - Non-Road Equipment - Other	135,440.2
Mobile - On-Road Diesel Heavy Duty Vehicles	2,777.3
Mobile - On-Road Diesel Heavy Duty Vehicles	2,104,069.0
Mobile - On-Road Diesel Heavy Duty Vehicles	1,042.0
Mobile - On-Road Diesel Light Duty Vehicles	231.5
Mobile - On-Road Diesel Light Duty Vehicles	173,392.7
Mobile - On-Road Diesel Light Duty Vehicles	183.0
Mobile - On-Road non-Diesel Heavy Duty Vehicles	1,197.1
Mobile - On-Road non-Diesel Heavy Duty Vehicles	355,696.9
Mobile - On-Road non-Diesel Heavy Duty Vehicles	3307.8
Mobile - On-Road non-Diesel Light Duty Vehicles	11,604.0
Mobile - On-Road non-Diesel Light Duty Vehicles	7,646,235.0
Mobile - On-Road non-Diesel Light Duty Vehicles	128,685.7
Total CO2e Emissions	**11,716,922.7**

1 The table represents those emissions sources as identified according to the EPA's National Emissions Inventory.
Source: EPA 2011

Although total emissions resulting from mining, processing, transporting, and burning are quantifiable, it is not possible to accurately assess the effects of a specific amount of CO2e emissions on global warming and climate change. *GHG emissions from a source, or even a group of sources, cannot be directly attributed to any specific climate change impact area. Only global emissions can be potentially related to global impacts, which is the goal of climate modeling efforts. Therefore, designating a specific impact area for the climate change resource, while possible, will not be directly related to emissions from the sources affected by the Proposed Action. There are no direct source-impact relationships for the GHG emissions associated with the John Henry No. 1 Mine.*

Although reasonable estimates for GHG emissions may be derived for a specific activity, there is uncertainty in evaluating longer-term emissions levels and the relationship between GHG sources and sinks over a lengthy and uncertain timeframe. Since climate change effects resulting from GHG emissions are global in scale, there is no reliable way to quantify whether or to what extent local GHG emissions can contribute to the larger phenomenon. There has been

no characterization of air quality related values that pertain to existing GHG conditions or climate change direct or indirect effects that is specific to the region.

EPA estimates that 6,526 million metric tons of CO_2e were emitted from all sources in the United States in 2012 (EPA 2014). Within Washington state 91.7 million metric tons of CO_2e were emitted in 2011 (WDOE 2014). It is reasonable to assume that the impact of direct and indirect CO_2e emissions from annual operation of the John Henry No. 1 Mine on climate change would be negligible and *long*-term. Negligible is defined as causing no discernible impact on global climate The duration of the Proposed Action would be for seven years which is too short of a time frame to create a discernible change in climate patterns; *however due to the nature of GHGs ability to remain in the atmosphere for long periods of time the impacts would be long-term.* The Proposed Action would result in emissions *of 240,110* tons of CO_2e per year for approximate total emissions (direct and indirect) of 1,*443,797 metric* tons. *When compared to local King County, Washington direct and indirect GHG emissions from the Proposed Action Alternative would be less than two percent of total county emissions per year, see Table 9. Although, indirect emissions from coal combustion and transportation would not occur entirely within King County it can be expected that other areas would have similar total GHG emissions.*

3.5.2.2 No Action Alternative

Direct impacts are from fuel consumed by heavy equipment used for reclamation activities. Final reclamation plan bond calculations, found in Section 3.6 of the PAP, assume that scrapers and dozers would be the prime items of equipment used to achieve the objectives of the plan (PCCC 2011a). Scrapers would operate 10,487 hours and dozers 4,068 hours over the two-year period. Dozers and scrapers are each estimated to consume 15 gallons per hour of diesel for total fuel consumption of 218,325 gallons under OSMRE's bonding calculations. A grader and water truck would be used part time and will consume an additional 10,000 gallons of fuel. This activity results in total consumption of 228,325 gallons of diesel fuel. Using the WDOE spreadsheet, 2,338 metric tons of CO_2e emissions over a two-year period are directly emitted under the No Action Alternative (WDOE 2011b).

The impact from GHG emissions under the No Action Alternative would be less than the Proposed Action Alternative and would be negligible and short-term because the duration of the No Action Alternative would be for two years which is too short of a time frame to create a discernible change in climate patterns. The No Action Alternative would result in total emissions 2,338 tons of CO_2e for two years of reclamation activities which would not exceed Washington's GHG emission reduction standards. The No Action Alternative would not create a discernible change in climate patterns due to its short, two-year duration. No coal would be mined, processed, transported, or consumed. Therefore there are no indirect impacts under this alternative.

3.6 Air Quality

3.6.1 Affected Environment

The direct impacts study area for the air quality analysis is King County. The indirect impacts study area includes King, Snohomish, Pierce, and Kitsap counties in Washington State as well as the Lower Fraser Valley in British Columbia. The existing environmental conditions related to air quality in the study area are described below.

3.6.1.1 Meteorology

The Western Region Climate Center (WRCC) provides climate summaries for western states including Washington State. The closest monitors to the Mine are: 1) the Seattle-Tacoma International Airport, 2) Seattle-Boeing FLD/King County International Airport, and 3) the Richmond South monitor, Richmond, BC in the Lower Fraser Valley and operated by Metro Vancouver (WRCC 2015 and Metro Vancouver 2012).

Table 10 shows precipitation, temperature, and wind data for the Seattle-Tacoma International Airport and Seattle-Boeing FLD/King County International Airport locations. The Richmond monitor (2012 – 2014 Fraser Valley Air Quality Monitoring) reports a predominately easterly wind with a smaller component from the west, and very little wind from either the north or south. Richmond South received on an annual average of 778 – 1040 millimeters of precipitation per year and annual average temperature of 10.6 °C (51.08 °F) – 11.2 °C (52.16 °F) (Metro Vancouver 2013a, 2014, and 2015b).

Washington State also operates an air monitoring network with the closest monitoring location being Enumclaw-Mud Mountain in King County, WA. Appendix A includes a wind rose of data obtained from the Enumclaw station.

Washington State also operates an air monitoring network with the closest monitoring location being Enumclaw-Mud Mountain in King County, WA. Appendix A includes a wind rose of data obtained from the Enumclaw station.

Table 10. Precipitation, Temperature, and Wind for the Study Area

Description	Monitoring Location	
(yearly average)	Seattle-Tacoma International Airport (1998-2008)	Seattle-Boeing FLD/King County International Airport (1998-2008)
Precipitation (inches)	38.18	36.04
Temperature (°F)	52.2	53

Wind speed (mph)	7.3	5.6

Sources: WRCC 2015 and Metro Vancouver 2015b
mph = miles per hour; °F = degrees Fahrenheit

3.6.1.2 Criteria Air Pollutants

The Clean Air Act (CAA) requires the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for pollutants considered harmful to public health and to the environment (Table 11). There are six criteria air pollutants in the United States, of which ozone *and short-term PM2.5 are* the major concern*s* in the Puget Sound region (PSCAA 2014):

- **Carbon monoxide** – Carbon monoxide is largely from motor vehicle exhaust. Carbon monoxide levels are well below Federal standards and no longer considered a pollutant of concern in the Puget Sound area. This region was designated as "attainment" status in 1996 and has not violated the carbon monoxide standard since 1990. WDOE monitors carbon monoxide levels (WDOE 2015).
- **Ozone** – The bulk of the region's ozone-causing nitrogen oxides and volatile organic compounds come from the transportation-sector emissions from cars and light trucks, marine vessels, and heavy-duty diesel vehicles. Other sources include gasoline refueling; industrial solvents; and auto-body paint shops, among others (WDOE 2015).
- **Lead** – Lead has not been monitored in the Puget Sound area since 1999 due in large part to the phase-out of lead in fuel (unleaded) and the closure of the Harbor Island secondary lead smelter (PSCAA 2014).
- **Sulfur dioxide** – Sulfur dioxide levels are well below the Federal health standard for King County, and have been so for several decades. The Puget Sound Clean Air Agency (PSCAA) stopped monitoring for sulfur dioxide in 1999. WDOE continues to monitor for sulfur dioxide at a site on Beacon Hill (PSCAA 2014).
- **NO_x (Nitrogen dioxide and nitrogen oxide)** – NO_x levels are well-below federal air quality standards, and are monitored by the WDOE (PSCAA 2014).
- **Particulate matter** – Particulate matter (PM) includes both solid matter and liquid droplets suspended in the air. Exhaust from diesel-powered vehicles is a source of particulates, but the majority is from wood smoke and industrial sources (PSCAA 2014). The county is in attainment for PM but currently exceeds the PSCAA's more stringent PM2.5 health goal of 25 micrograms per cubic meter (PSCAA 2015). Total suspended particles (TSP) were previously monitored and modeled at the Mine and King County concluded that over 95% of particulate matter would settle out on PCCC's mine site and that air quality standards for particulate matter would not be exceeded (*See* Appendix A, *Air Quality Technical Analysis*). *The Tacoma-Pierce County was re-designated to attainment for the 2006 24-hour fine particle NAAQS standard in March 2015 (WDOE 2017).*

Table 11. National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide	primary	8 hours	9 ppm	Not to be exceeded more
(CO)		1 hour	35 ppm	than once per year
Lead (Pb)	primary and	Rolling 3 month period	0.15 µg/m^3(1)	Not to be exceeded
	secondary			
Nitrogen Dioxide	primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
(NO_2)	primary and	1 year	53 ppb(2)	Annual Mean
	secondary			
Ozone (O_3)	primary and	8 hours	0.070 ppm(3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
	secondary			
Particle Pollution (PM) - PM2.5	*primary*	*1 year*	*12.0 µg/ m^3*	*annual mean, averaged over 3 years*
PM2.5	*secondary*	*1 year*	*15.0 µg/ m^3*	*annual mean, averaged over 3 years*
PM2.5	*primary and secondary*	*24 hours*	*35 µg/ m^3*	*98th percentile, averaged over 3 years*
PM10	*primary and secondary*	*24 hours*	*150 µg/m^3*	*Not to be exceeded more than once per year on average over 3 years*
Sulfur Dioxide	primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
(SO_2)	secondary	1 year	15.0 µg/ m^3	Not to be exceeded more than once per year

Source: EPA 2016c

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

King County, Washington was in nonattainment from 1992 to 2000 for PM_{10} (1987 standard) and from 1992 to 1995 for 1-hour Ozone (1979 standard – revoked) and Carbon Monoxide (1971 standard). King County is currently in attainment for all criteria pollutants (PM, CO, O_3, NO_x, SO_2) (EPA 2016c). According to the 2015 air quality data summary report by the PSCAA[6] air quality in the region is generally improving with the greatest air quality challenge associated with fine particle levels and ozone (PSCAA 2015). The counties within PSCAA's jurisdiction[2] are in attainment with the NAAQS's for PM, CO, O_3, NO_x, SO_2 but currently exceed the PSCAA's more stringent $PM_{2.5}$ health goal of 25 micrograms per cubic meter. Ozone levels as monitored at the Enumclaw Mud Mountain site have the highest regional ozone concentrations approaching levels close to the Federal standard. The majority of air quality index (AQI) ratings within the region are within the good percentage (over 50%) indicated by 0-50 AQI values which equates to air pollution that poses little or no risk to the public (PSCAA 2015).

Potential customers of the coal mined at John Henry No. 1 Mine are located in Washington State and British Columbia (within the Lower Fraser Valley air quality region). British Columbia, Canada uses ambient air quality criteria that have been developed for national and provincial uses to management air emissions. Table 12 below provides a list of all air quality emissions standards in British Columbia (additional tables are provided in Appendix A). According to the 2014 air quality monitoring report prepared by the Air Quality and Climate Change Division of Metro Vancouver CO, NO_2, SO_2, and $PM_{2.5}$ short-term peak and average concentrations have declined since the early nineties while average regional O_3 levels are slightly increasing. In 2014, emissions in the Lower Fraser Valley were on average below British Columbia Ambient Air Quality Objectives for O_3, NO_2, CO, SO_2, and $PM_{2.5}$ with a few instances of daily exceedances due to environmental factors such as wildfires (Metro Vancouver 2015b).

[6] The Puget Sound Clean Air Agency's jurisdiction covers King, Snohomish, Pierce, and Kitsap counties (PSCAA 2015).

Table 12. British Columbia Ambient Air Quality Objectives[a,b,c,d,e,f]

Contaminant	Averaging Period	Criteria	Level	Air Quality Objective		Date Adopted
				µg/m^3	ppb	
Carbon Monoxide (CO)	1 hour	PCOs for Food-processing, Agriculturally Orientated, and Other Misc. Industries	A	14,300	13,000	1975
			B	28,000	25,000	
			C	35,000	30,000	
	8 hour	PCOs for Food-processing, Agriculturally Orientated, and Other Misc. Industries	A	5,500	5,000	1975
			B	11,000	10,000	
			C	14,300	13,000	
Formaldehyde	1 hour	Provincial AQO	Action	60	50	1995
			Episode	370	308	
Nitrogen Dioxide (NO_2)	1-hour	Interim Provincial AQO	-	188	100[g]	2014
	Annual	Interim Provincial AQO	-	60	32	2014
Ozone (O_3)	1 hour	NAAQO Maximum Acceptable Level	Advisory	160	82	1989
	8 hour	CAAQS	-	123	63[h]	2013
Particulate Matter <2.5 microns ($PM_{2.5}$)	24 hour	Provincial AQO	-	25[i]	-	2009
		CAAQS	-	28[j]	-	2013
	Annual	Provincial AQO	AQO	8	-	2009
			Goal	6		2009
		CAAQS		10[k]		2013
Particulate Matter <10 microns (PM_{10})	24 hour	Provincial AQO	-	50	-	1995
Sulphur Dioxide (SO_2)	1 hour	Interim Provincial AQO	-	200	75[l]	2014
Total Reduced Sulphur (TRS) compounds measured as H2S	1 hour	PCOs for the Forest Products Industry	A	7	5	1977
			B	28	20	

	24 hour		A	3	2	1977
			B	6	4	

Source: British Columbia 2016

Pollution Control Objectives = POCs; Provincial Air Quality Objectives = AQO's; National Ambient Air Quality Objectives = NAAQO; Canadian Ambient Air Quality Standards = CAAQS; Provincial Level A, B and C Pollution Control Objectives (B.C.) = A, B and C

a http://www.env.gov.bc.ca/epd/main/ema.htm

b For more information, see: http://www.bcairquality.ca/regulatory/air-objectives-standards.html

c Pollution Control Objectives were developed by the B.C. Ministry of Environment and the B.C. Department of Lands, Forest, and Water Resources in the 1970s for five source sectors: the Forest Products Industry, the Mining, Smelting and Related Industries, Food-processing, Agriculturally Orientated and Other Miscellaneous Industries, the Chemical and Petroleum Industries and Municipal Type Waste Discharges. These criteria, which referred to all discharges to the environment, were rescinded in 2006, but the ambient air quality objectives continue to be used for reference purposes.

d Canada Gazette, Part I, Department of the Environment, *National Ambient Air Quality Objectives for Air Contaminants*, August 12, 1989.

e Canadian Ambient Air Quality Standards for 2015 and 2020 were adopted in 2013 by Canadian Council of Ministers of the Environment, and supersede Canada-wide Standards for Particulate Matter and Ozone (see: http://www.gazette.gc.ca/rp-pr/p1/2013/2013-05-25/html/notice-avis-eng.html#d106).

f Metro Vancouver (2011) *Metro Vancouver Integrated Air Quality and Greenhouse Gas Management Plan*. http://public.metrovancouver.org/about/publications/Publications/IntegratedAirQualityGreenhouseGasManagementPlan-October2011.pdf

g Achievement based on annual 98th percentile of daily 1-hour maximum, over one year

h Achievement based on annual 4th highest daily 8-hour maximum, averaged over three consecutive years.

i Achievement based on annual 98th percentile of daily average, over one year

j Achievement based on annual 98th percentile of daily average, averaged over three consecutive years

k Achievement based on annual average, averaged over three consecutive years

l Achievement based on annual 99th percentile of daily 1-hour maximum, over one year

3.6.1.3 Existing Emissions

Table 13 shows existing pollutant levels at a Seattle-area monitoring station northwest of the direct impact study area. The monitoring location with the most comprehensive data set was located in Seattle, WA on 4103 Beacon Hill Street approximately 32 miles from the John Henry No. 1 Mine (EPA 2016h). Table 14 presents exiting emissions data from 2011 for the Lower Fraser Valley in British Columbia. Existing emissions data for the Lower Fraser Valley is also available in the 2012, 2013, and 2014 monitoring reports indicating that on average the annual pollutant emissions are below British Columbia Ambient Air Quality Standards with exceedances occurring due to extreme weather events such as wildfires (Metro Vancouver 2013a, 2014, and 2015b).

Table 8. Average Monitoring Values (Seattle, WA)

Pollutant	2015	2014	2013	2012	2011	2010
Criteria Pollutants						
CO (8annual average; ppm)	*0.2299*	*0.2431*	*0.2409*	*0.2295*	*0.2441*	*0.2418*
O_3 (8-hour; ppm)	*0.019*	*0.019*	*0.017*	*0.019*	*0.018*	*0.018*
$PM_{2.5}$ (annual average; µg/m3)	*6.5*	*5.9*	*6.6*	*6.0*	*5.9*	*5.7*
NO_2 (annual average; ppb)	*10.649*	*11.582*	*11.924*	*12.1*	*12.4*	*12.5*
SO_2 (annual average; ppb)	*0.87*	*Incomplete*	*0.85*	*1.00*	*1.12*	*1.14*
PM_{10} (24-hour; µg/m3)	11.2583	10.0862	10.5088	10.6909	8.6119	10.7124
Hazardous Pollutants (24-hour measurements; ppb)						
Acetaldehyde	0.7864	0.7656	0.793	0.8233	1.0433	0.8914
Acrolein	0.6921	0.6778	0.855	0.9123	0.811	1.439
Benzene	0.9789	0.947	1.0509	1.0958	1.3359	1.2949
1,3 butadiene	0.1159	0.1255	0.1347	0.1542	0.1592	0.119
Ethyl benzene	0.3616	0.437	0.4384	0.5108	0.5439	0.4437
Formaldehyde	0.4831	0.4934	0.4596	0.435	0.6817	0.5147
Toluene	2.1443	2.1813	2.3874	2.5762	3.017	2.5428
Xylene	0.4277	0.4997	0.4805	0.5737	0.5767	0.445

Source: EPA 2016h; *WDOE 2017*

µg/m3 = micrograms/cubic meter; ppb = parts per billion; ppm = parts per million

Values rounded.

NO_2 was added to monitoring values in 2013, 2010-2012 used nitric oxide 1-hour values.

2010 to 2012 NO2 levels are approximated from total reactive nitrogen minus nitric oxide (NOy – NO)

Incomplete = too few measure values to obtain an appropriate estimate of average annual concentration

Table 14. 2010 Average Annual Emissions (Lower Fraser Valley, British Columbia)

Pollutant	Lower Fraser Valley (tons)
VOC	87,530
CO	353,760
NO_X	60,410
SO_2	12,090
$PM_{2.5}$	7,570
PM_{10}	N/A

N/A = Not reported

Source: Metro Vancouver 2013b

3.6.1.4 Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are regulated by EPA through emission standards under the CAA. The most common subset of hazardous pollutants analyzed are those HAPs which fall under the Mobile Source Air Toxics (MSAT) rule which are typically associated with transportation sources including motor vehicles, construction equipment, and locomotives and are: acetaldehyde, acrolein, benzene, 1,3 butadiene, ethyl benzene, formaldehyde, n-hexane, toluene, and xylene.

Under the Mercury and Air Toxics Standards rule, mercury is considered a hazardous air pollutant with strict emission standards for power plants. Mercury is a naturally occurring element found throughout the world with a life of 6 to 24 months in the atmosphere allowing it travel globally. There are many natural sources that emit mercury into the atmosphere, including the weathering of mercury-containing rocks, volcanoes when they erupt, and geothermal activity. Mercury previously deposited from air onto soils, surface waters, and vegetation from past emissions can be emitted back to the air. Mercury may be deposited and reemitted many times as it cycles through the environment. Mercury from coal combustion accounts for approximately 24 percent of the total amount of mercury entering the atmosphere each year (United Nations Environment Programme 2013).

On December 16, 2011, the EPA issued the final Mercury and Air Toxics Standards (MATS) and Utility New Source Performance Standards (NSPS) rulemakings which were published in the Federal Register on February 16, 2012 (77 FR 9304). Promulgated as 40 CFR 63 Subpart UUUUU – National Emission Standards for Hazardous Air Pollutants (NESHAPS) for Coal- and Oil-Fired Electric Utility Steam Generating Units, the MATS rule establishes emission limitations and work practice standards for HAPs emitted from coal- and oil-fired electric utility steam generating units along with requirements to demonstrate initial and continuing compliance with the HAP emission limits.

3.6.1.5 Visibility

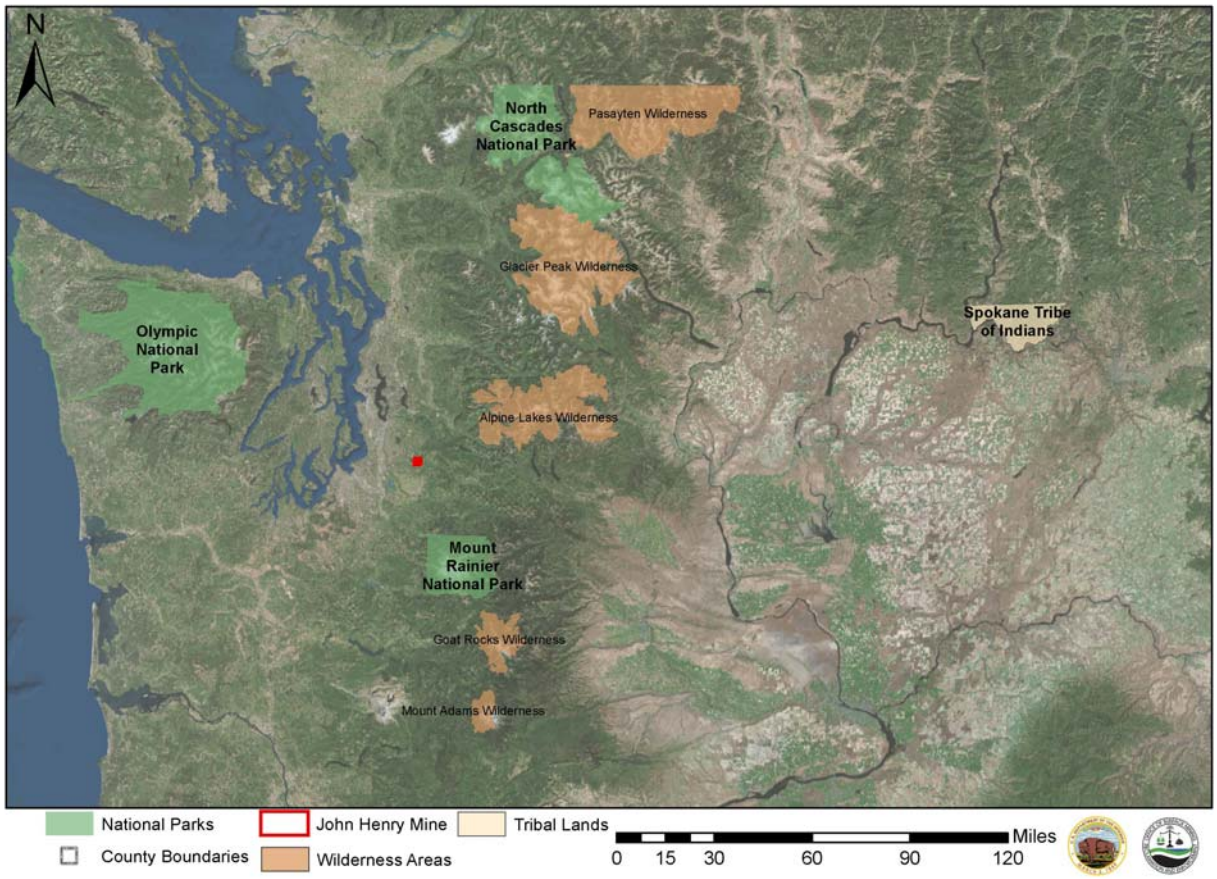
In the context of the prevention of significant deterioration program, all state air quality jurisdictions are divided into three classes of air quality protection. Class I areas are areas of natural wonder and scenic beauty, such as national parks, national monuments, and wilderness areas, where air quality should be given special protection. Class I areas are subject to maximum limits on air quality degradation called air quality increments which are more stringent than the NAAQS. Washington State has eight Class I areas including wilderness areas and national parks (EPA 2016a); *see* Table 15 and Figure 8.

Table 9. Class I Areas

Class I Area	Distance (from John Henry)
Alpine Lakes Wilderness, Ronald, WA	45 miles
Glacier Peak Wilderness, Snohomish County, WA	77 miles
Goat Rocks Wilderness, Randle, WA	60 miles
Mount Adams Wilderness, South Yakima, WA	83 miles
Mount Rainier National Park, King County, WA	34 miles
North Cascades National Park, Okanogan County, WA	104 miles
Olympic National Park, Port Angeles, WA	81 miles
Pasayten Wilderness, Okanogan County, WA	122 miles
Spokane Indian Reservation	*184 miles*

Source: EPA 2016a

Figure 8. Class I Areas



Washington State is part of the Western Regional Air Partnership (WRAP). WRAP is a voluntary partnership of states, tribes, federal land managers, local air agencies, and the EPA who research current and future air quality issues within the Western Region. Issues include

planning for the Regional Haze Rule, air quality issues pertaining to ozone, particulate matter, mercury, effects of transportation emissions, and impacts of climate change within the region (WRAP 2016). WRAP is currently working on the revision to the Regional Haze Plan due in 2018 in accordance with the EPA's Regional Haze Regulations. Provisions of the regional haze rule that require emission controls known as Best Available Retrofit Technology, or BART, for industrial facilities emitting air pollutants that reduce visibility would apply to the Mine and indirect coal combustion. Actual project emissions are presented in Section 3.6.2, *Environmental Consequences*.

Regional haze impairs visibility and is produced by emissions from numerous sources located across broad geographic areas. Visibility impacts occur when emissions absorb and scatter light in the atmosphere reducing the clarity of views. Visibility is measured over 24-hour periods and calculated as a percent increase in light extinction compared to a pristine background. Impacts are expressed as the number of days annually that show visibility reductions of 5, 10, or 20 percent.

Interagency Monitoring of Protected Visual Environments (IMPROVE) data shows that from 2010 to 2014 visibility in Mount Rainier, North Cascades, and Olympic National Park. Class I areas each had approximately 10 worst visibility days (IMPROVE 2016). *See* Figures 9 and 10 for an example of the composition of total mass contributing to regional haze and visibility trends at Mount Rainier National Park the closest Class I area to the Mine.

Figure 9. Total Mass Budgets for Mount Rainier National Park (2015)

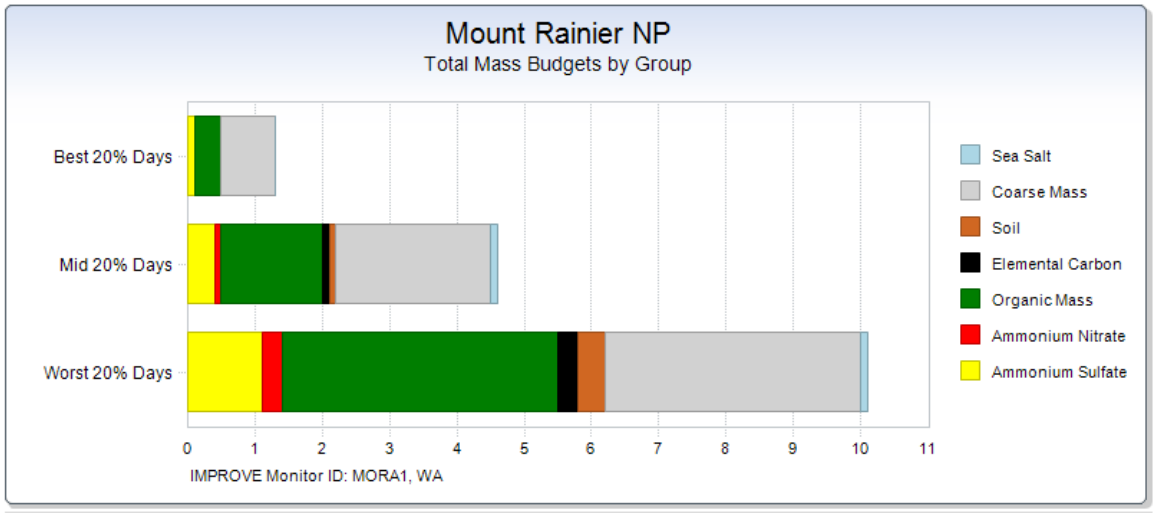
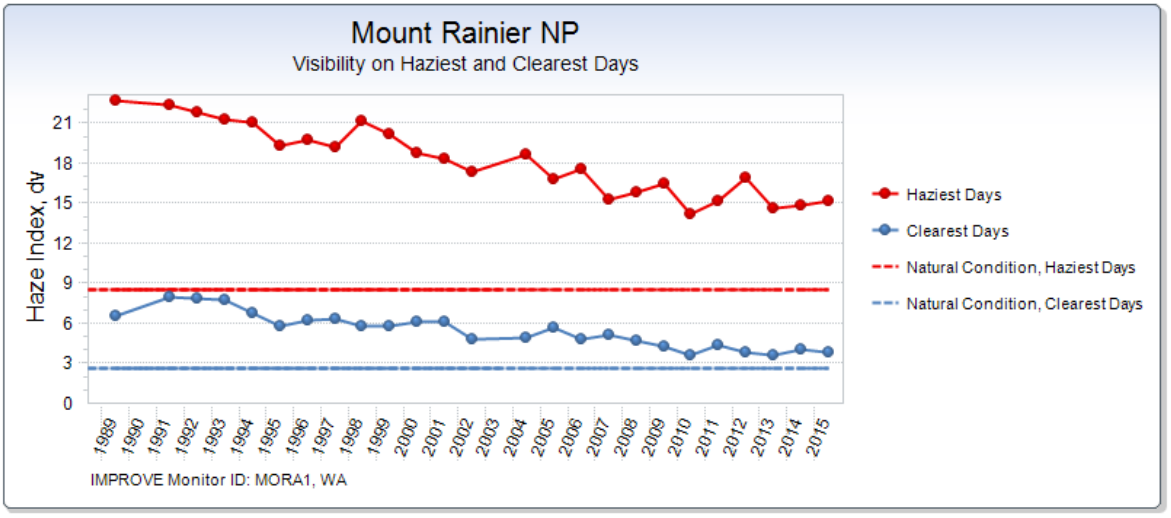


Figure 10. Visibility on Haziest and Clearest Days for Mount Rainier National Park (2015)



Federal Standards of Performance for Coal Preparation and Processing Plants (40 CFR, Part 60, Subpart Y 2009) apply to the facility. PCCC's mine contains the following affected facilities: coal processing and conveying equipment, coal storage systems, coal transfer, and loading systems that were constructed before April 28, 2008. The facility also contains open storage piles which are not affected facilities under Federal NSPS; because they were constructed prior to May 27, 2009 *see* Table A-5. The facility does not include any thermal dryers or pneumatic cleaning equipment.

The 2010 application NSPS emission standard (40 CFR 60.254), regarding facilities constructed before April 28, 2008, sets a limit of 20 percent opacity on coal processing and conveying equipment (including breakers and crushers), coal storage systems[7], and transfer and loading systems. 40 CFR 60.255(a) requires a performance test of the limits (EPA Method 9) within 60 days after achieving the maximum production rate at which the affected facility would be operated, but not later than 180 days after initial startup of such facility (40 CFR 60.8). Table A-5 summarizes the NSPS Subpart Y emission standards and the applicable Subpart Y emission standard for the facilities present at the John Henry No.1 Mine.

The State of Washington implements the NAAQS, and develops air quality attainment and maintenance plans, in order to keep Washington in compliance with the Federal NAAQS. The Puget Sound air shed has been in compliance with the annual $PM_{2.5}$ standard since the EPA promulgated it in 1997. The Black Diamond area is in compliance with the Federal air quality standards for CO, O_3, PM, SO_2, and NO_x (PSCAA 2014).

[7] Including stock piles, silos, or other covered storage buildings.

3.6.2 Environmental Consequences

Emissions from employee vehicles, construction equipment, and operational equipment were calculated for total years of operation including reclamation under the Proposed Action and No Action Alternatives *see* Table 16 (EPA 1985; EPA 2010a, b, and c; EPA 2015; EPA 2016f). *See* Appendix A, *Air Quality Technical Analysis,* for detailed emissions tables including emission factors.

Table 10. Total Emissions by Alternative

Pollutant	Proposed Action	No Action	Proposed Action	No Action
	tons per year		total tons	
Criteria Pollutants				
CO	7.5	6.5	49	13
NOx	36	30	234	60
PM10	1.4	1.2	9.2	2.5
PM2.5	1.4	1.2	8.9	2.4
SO2	8.4	7.1	55	14
VOC	1.5	1.2	9.8	2.5
Hazardous Air Pollutants				
Acetaldehyde	0.11	0.09	0.68	0.17
Acrolein	0.015	0.012	0.1	0.02
Benzene	0.02	0.016	0.13	0.03
1,3-Butadiene	0.001	0.001	0.01	0.002
Ethylbenzene	0.01	0.008	0.06	0.015
Formaldehyde	0.33	0.27	2.14	0.54
n-Hexane	0.008	0.007	0.05	0.013
Toluene	0.045	0.037	0.3	0.074
Xylene	0.058	0.047	0.37	0.094

Sources: EPA 1985; EPA 2010a, b, and c; EPA 2015; EPA 2016f

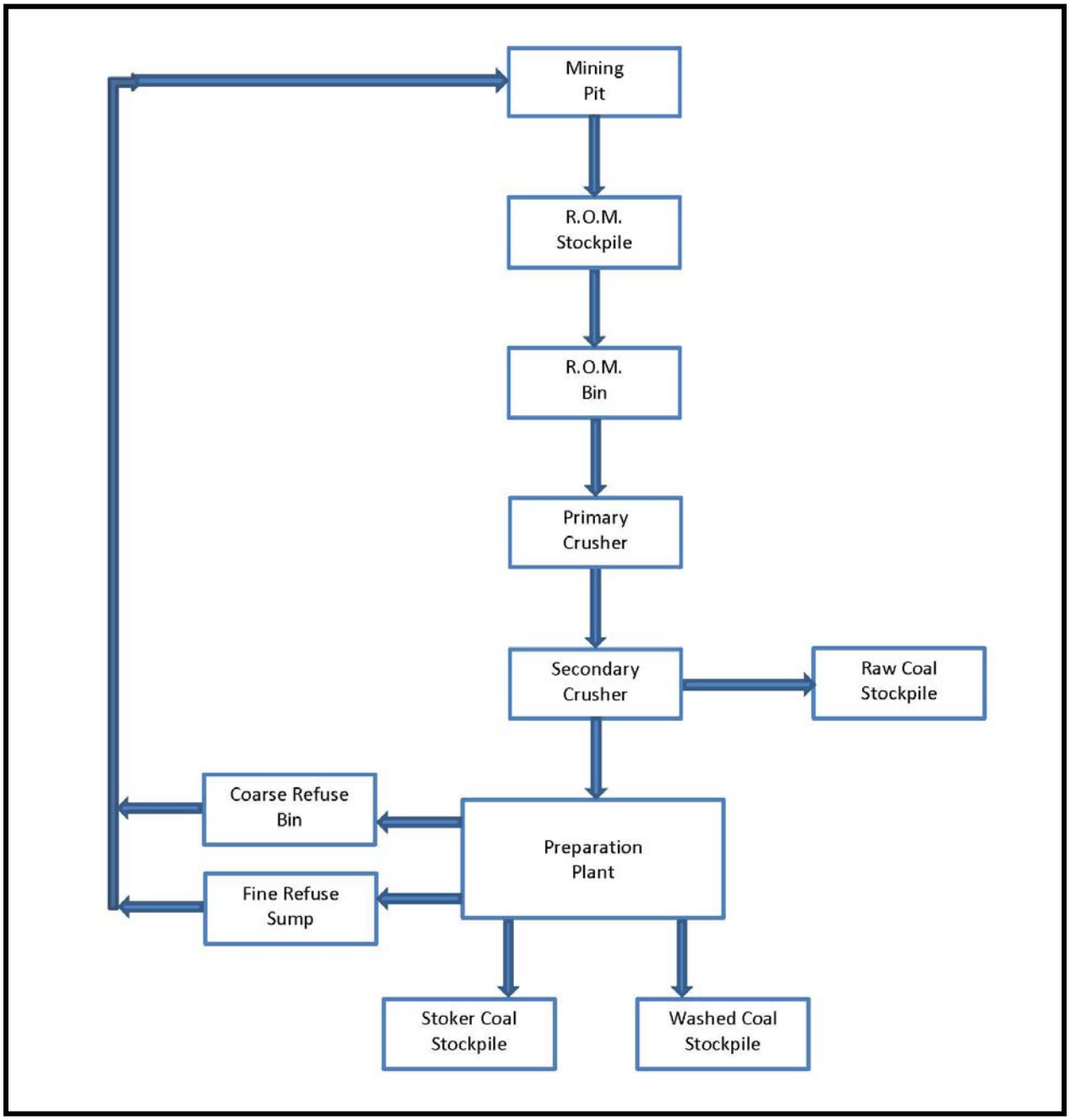
Emissions from the Proposed Action and No Action Alternatives would result in exhaust emissions from vehicles and operational equipment as well as fugitive dust emissions from wind erosion of stock piles and coal crushing equipment. The total emissions of PM_{10} and $PM_{2.5}$, presented in Table 16, are the sum of emissions from exhaust and wind erosion. PM emissions from coal crushing equipment were modeled separately. The effects of operational emissions would be temporary and at any given time would occur only where operations are occurring or along roadways traveled by vehicles. The effects of operational emissions on ambient air quality would vary with time due to the operational schedule, mobility of emission sources, type of equipment in use, and local meteorological conditions. Operational emissions are not anticipated to lead to pollutant concentrations that would violate the NAAQS or impair regional air quality conditions. Emissions from lead are expected to be far below the NAAQS because of EPA's diesel and gasoline fuel standards regulating fuel use in highway, non-road, and marine vessels as well as the CAA amendment (Section 218) in January 1996 which banned the sale of leaded fuel for use in on-road vehicles (EPA 2016i).

Particulate matter emissions as total suspended particulates (TSP) were modeled when the original notice of construction permit (NOC) was issued in 1984 by Puget Sound Air Pollution Control Agency (PSAPCA), the predecessor of PSCAA (PSAPCA 1984). *See* Appendix A, *Air Quality Technical Analysis,* for previous monitoring and modeling data. Upon proposing to resume mining in 2010 as described under the Proposed Action, PCCC applied to PSCAA for a permit to operate two coal crushers and associated coal-processing equipment. PSCAA updated their analysis to include estimates of PM_{10} and $PM_{2.5}$ based on previous modeling for TSP. The new permit was granted on September 6, 2010 (PSCAA 2010). The results of the modeling are presented in Appendix A. The original modeling for NOC 2390 as modified above by PSCAA resulted in ambient concentrations of particulate due to the proposed activity that were less than the ambient air quality standards for PM_{10} and $PM_{2.5}$. There has been no additional modeling required by PSCAA. The original design capacity of the plant was 350,000 tons coal per year. Modeled operations were approximately 134,000 tons coal per year. Emissions were evaluated in the original permit application for Order of Approval 2390 (PASPCA 1984). At that time, emissions were evaluated as TSP.

For the 2010 NOC application, the TSP emissions were converted to PM_{10} and $PM_{2.5}$ emissions for potential and actual expected operation of the preparation plant and mine. Emissions were estimated by multiplying the emissions by the ratio of production planned under the Proposed Action Alternative and the design maximum production. Emissions from the coal cleaning plant and mine estimated emission sources and rates (including fugitive dust from haul roads) TSP would be 55.3 tons per year, PM10 emissions would be 23.3 tons per year, and PM2.5 emissions would be 1.4 tons per year (*See* Appendix A, *Air Quality Technical Analysis*).

For the purposes of determining Title V and Prevention of Significant Deterioration applicability as a major source PSCAA followed the example given in EPA guidance dated March 6, 2003 (EPA 2003) and August 9, 2007 (EPA 2007). In the March 6, 2003 guidance it is determined that for a coal mine and associated coal cleaning plant the coal mining is the primary activity, *see* Figure 11. However, because the coal cleaning plant is a listed source category, fugitive emissions only from the coal cleaning plant are used to determine if the source is a major stationary source. The August 9, 2007 guidance clarifies that fugitive dust from haul roads associated with coal cleaning also count toward the major source thresholds.

Figure 11. Coal Processing Flowchart



Another minor change in the facility since the original emission estimate is that refuse exits the building in separate fine and coarse streams. The fine refuse stream is sent to a small sump of about twenty tons. Because the material entering the sump is wet, emissions are expected to be negligible (PSCAA 2010). According to PCCC, this is filter cake material from a belt press and contains 20-30 percent moisture by weight.

The following permit stipulations have been and would continue to be used to reduce potential adverse impacts from dust:

1. Water and/or an approved chemical suppressant such as ammonium lignin sulfonate would continue to be applied to unpaved haul roads to control dust. PCCC would maintain a copy of the Material Safety Data Sheet for any dust suppressant used.

2. Haul trucks would continue to reduce speed in the event roads are not timely applied with water and/or a dust suppressant.

3. Paved roads would continue to be flushed with water to remove roadway dust.

4. Disturbed areas have been and would be revegetated as soon as weather permits. Disturbed areas have not been and would not be revegetated during wet weather conditions.

5. Water sprays would continue to be used to suppress dust at coal dumping and crushing locations.

6. The coal transfer point would continue to be covered to minimize windblown dust.

7. All conveyors would continue to be covered.

8. Overburden drills would continue to be equipped with a dust collection system.

9. No additional disturbance around the facilities would be required.

10. PSCAA could require monitoring if it deems necessary.

PSCAA summarized its modeling results as shown in Table 17.

Table 11. *1984 and 2010* Modeled Particulate And NAAQS *for PSCAA Permit*

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total ($\mu g/m^3$)	State or NAAQS ($\mu g/m^3$)
PM_{10}					
	Annual	13	19	32	50
	24-hr	32.4	76	108.4	150
$PM_{2.5}$					
	Annual	0.6	4	4.6	15
	24-hr	1.6	10	11.6	35

Notes:
1. PM_{10} derived from TSP using mass fraction if 0.422 for PM_{15} found in USEPA Region 10, letter dated January 11, 1984. This should over predict PM_{10} concentrations.
2. $PM_{2.5}$ derived from TSP using mass fraction if 0.021 for PM_{15} found in USEPA Region 10, letter dated January 11, 1984.
3. PM_{10} background concentration used is from 2006 James Street monitor in Kent. 2006 was the last year the agency monitored PM_{10}. Annual background is the 2006 average concentration. 24-hr is the maximum 24-hr average for 2006. The urban location of this monitor should over predict particulate for Black Diamond.
4. $PM_{2.5}$ background concentration used is from 2006 Mud Mountain monitor. 2006 was the first highest annual average for PM2.5 at the Mud Mountain monitor.
5. PM_{10} 24-hr NAAQS is also a State Ambient Air Quality Standard.
6. PM_{10} annual is a State Ambient Air Quality Standard.
7. Modeled concentrations based on modeled TSP from USEPA Region 10, letter and analysis dated January 11, 1984.

3.6.2.1 Proposed Action Alternative

3.6.2.1.1 Direct Impacts

Mining at the historic rate of 350,000 tons per year showed negligible impacts on local or regional air quality. Under the Proposed Action Alternative mining at the proposed rate of 84,000 tons per year would have lower impacts than historic mining rates. Potential emissions are presented in Table 16. PCCC is not currently required to implement an air quality monitoring program under 30 CFR § 780.15 because it does not produce more than 1,000,000 tons per year. PCCC does maintain a dust control program.

All active roads within the mine site would be watered as necessary during dry or dusty conditions. These conditions normally occur from June through September. The temporary spoil piles have been covered with topsoil, seeded, and re-vegetated. Coal waste would be mixed with overburden in the backfill area and not stored separately. Coal stockpiles would be watered as necessary. This is not predicted to occur frequently due to relatively damp weather conditions and wet process used to separate impurities from the coal in the plant. As topsoil is spread, it would be immediately reseeded and with optimum growing conditions in the spring and fall, ground cover would be established quickly. This has proven an effective means of controlling fugitive dust emissions. No thermal dryers would be used. The preparation plant feed hopper and the crushers at the coal preparation plant would continue to be equipped with water

spray devices to minimize dust. The blast hole drill would use water to minimize dust from the drilling operations. Disturbed acreage would be kept to a minimum, and would be topsoiled and seeded as soon as possible to eliminate possible sources of dust.

Best Available Control Technology (BACT) would be applied where required at the coal processing plant. BACT would help to attain limits for Coal Processing and Conveying Equipment, including breakers and crushers, coal storage systems, transfer and loading systems, open storage piles (of processed coal and refuse), and associated equipment (40 CFR 60 Subpart Y). PCCC's plant operating and maintenance procedures target no visible emissions from coal processing and conveying equipment (including crushers), coal storage systems, transfer and loading systems, open storage piles (of processed coal and refuse), and associated equipment. Specifically:

- The enclosed crusher with water sprays would be BACT;
- If the material was dry, fully enclosed conveyors would be BACT, under the Proposed Action Alternative, given the wetness of handled product conveyor, covers would be BACT;
- Enclosed coal preparation plant would be BACT.

To complete final reclamation, the Proposed Action Alternative reclamation plan requires relatively short haul distances and a small mobile equipment fleet for haulage and dozer push of backfill and topsoil materials. The haul profile from Spoil Pile 3N and 3S to Pit 2 is entirely above the pit perimeter and would average 200 feet and 600 feet respectively. Fugitive dust from truck hauls would be controlled with water trucks during dry conditions.

Impacts on air quality from the Proposed Action Alternative would generally occur within the permit area but potentially could be local. The direct impacts would be short-term and negligible due, in part, to the fact that prevailing winds in the dry summer months are from the W to NW and the land use to the SE is managed forest with no residential development existing or planned (King County 2012). If reclamation of Spoil Pile 3S occurs during the summer the impacts would be confined within the permit area due to the prevailing wind conditions and location of Spoil Pile 3S (*see* Figure 1).

3.6.2.1.1.1 Transportation

Indirect impacts on air quality from emissions of criteria pollutants would be from transporting the coal to customers and from coal combustion. Truck transportation would be in Pierce and or King Counties. In 2014, trucks and buses traveled 582.6 billion miles in King County and 228.1 billion miles in Pierce County (Washington Department of Transportation 2015). As shown above in Section 3.4, *Climate Change*, coal haulage trucks are expected to travel 183,570 miles per year delivering coal to either Tacoma in Pierce County or Seattle in King County (*see* Table

18). The EPA has determined that Class *8b* trucks, as proposed for use, cause emissions of criteria pollutants and volatile organic compounds (VOC) (EPA 2008). These are expressed in terms of grams per mile traveled. Barge transportation is likely from either Tacoma or Seattle to *Richmond*, British Columbia. The U.S. Department of Transportation estimated emissions from towboat engines for VOC, CO, SO_x, Particulates, and NO_X based on pounds emitted for every ton of cargo transported 1,000 miles (USDOT 1994). If the entire 84,000 tons of annual production are transported by barge from Tacoma, WA to *Richmond*, BC, this would result in 11,424 ton-miles[8] (*see* Table 18).

[8] Unit of measure used to show the amount of a commodity (tons) traveled over a distance (miles).

Table 18. Criteria Emissions for Transportation Scenarios Compared to County and State Total Emissions

Pollutant	Emissions for Vehicles		Emissions for Barge[3,5]		Total Transportation Emissions	Emissions by County (tons per year)					
	Grams/Mile[1, 2]	Tons/year	grams/kilowatt-hour	Tons/year	Tons/year	King County (2011)	Snohomish County (2011)	Pierce County (2011)	Kitsap County (2011)	Washington (2011)	Lower Fraser Valley (2010)
VOC	*0.76*	*0.20*	0.5	*1.96*	*2.17*	71,472	40,799	36,725	13,554	881,868	87,530
CO	*3.0*	*0.80*	1.1	*4.32*	*5.12*	362,939	149,472	157,226	55,214	1,736,782	353,760
NOX	*11*	*2.93*	13.2	*51.87*	*54.80*	60,583	22,322	24,801	6,976	285,900	60,410
SO_2	*0.0066*	*0.001*	1.3	*5.11*	*5.11*	2,461	687	1,197	684	28,335	12,090
$PM_{2.5}$[4]	*0.45*	*0.12*	0.7	*2.66*	*2.78*	10,666	4,559	4,146	1,598	73,173	7,570
PM_{10}	*0.52*	*0.14*	0.72	*2.83*	*2.97*	27,505	8,069	9,214	2,730	230,957	N/A

N/A = Not reported

Sources: EPA 2009, 2013a, 2013b, Metro Vancouver 2013b, and WDOE 2016a

[1] Assumes 183,750 miles for travel distance. Values in this column come from "Updates to Transportation Parameters in GREET" Table 3, *Class 8b trucks,* which has a representative emissions factor for all heavy duty diesel trucks, including light commercial, short-haul and long-haul, single-unit and combination trucks.

[2] SO_2 emissions were provided from Argonne National Laboratory 2013b using 2017 model year diesel single unit long haul trucks.

[3] EPA 2009, Table 3-8, Tier 0 Category 2 vessel.

[4] PM2.5 is represented as 0.97 of PM10 (EPA 2009)

[5] Vessel emission calculation formula: E = P x LF x A x EF (EPA 2009)

Indirect truck and barge transportation impacts on air quality are expected to be negligible and short-term because annual vehicle and barge emissions under the Proposed Action Alternative would account for <1 percent of current emissions within the indirect impact study area whose counties are all currently in attainment and based on the short-term duration of the Proposed Action (seven years total).

3.6.2.1.1.2 Coal Combustion

PCCC coal sales would generally be on short-term basis. As explained above Section 3.4, *Climate Change*, PCCC has a contract to supply a portion of its production to Lehigh Cement located in Delta, British Columbia, Canada. Ash Grove Cement located in Seattle and Lafarge Cement in Richmond, British Columbia, Canada also represent potential customers. PCCC has stated that there may be potential customers at a lime kiln or pulp mill that burn coal and are located in the region (actual buyers at these facilities are not known as this time). Due to the speculative nature of the remaining customers, the EA's analysis provides coal combustion emissions at the Lehigh Cement Plant because they are a known customer.[9] Lehigh is the larger plant rated at about 3,850 tons of cement clinker per day. Lafarge Cement has a similar rate of about 3,800 tons of cement clinker per day. Ash Grove's capacity is 2,200 tons of clinker per day. The three plants are modern, energy efficient, dry process plants, that use multi-stage preheaters and pre-calciners. The three plants are equipped with continuous emission monitoring equipment that ensures compliance with applicable state and provincial air quality regulations. Fuel combustion is just one component of the overall emissions and coal use will vary depending on the price of alternative fuels. The amount of coal used from various sources is also based on relative costs and can vary on a daily basis.

According to the Lehigh Production Manager, fuel combustion has a lesser impact on emissions than the chemical makeup of the raw materials that are fed into the kiln. These materials include limestone, shale or clay, silica sand, and a source of iron. Emissions related to fuel combustion and cement manufacturing are measured in the stack, including CO, PM, NO_2, and SO_2 (*see* Table 19). Lehigh currently uses natural gas, petroleum coke, wood waste, and some plastic waste in addition to coal. Lehigh is constantly investing in ways to use more waste fuels in the mix. Lehigh does not expect a noticeable change in emissions with changes in the fuel mix (PCCC 2016).

Lehigh Northwest Cement Limited operates a dry process plant in Delta, British Columbia, Canada that is similar in design to Ash Grove's plant with multistage preheaters and a pre-calciner. It also uses multiple baghouses to control particulate matter. Lehigh operates under an Air Quality Management Permit issued by Metro Vancouver (Metro Vancouver 2010). Lehigh submits continuous emission monitoring data quarterly. Those reports show emissions in terms of milligrams per cubic meter for CO and SO_2 and kilograms per hour for NO_X. Lehigh does not

[9] CEQ's NEPA Forty Most Asked Questions, Question Number 18 (CEQ 1981).

monitor for O_3 and it is not included in the Lower Fraser Valley Air Monitoring Reports. Lehigh also reports the number of hours operated each quarter and the average airflow rate through the stack. Permit restrictions include the following:

NO_X	600 kilogram per hour
SO_2	500 milligrams per cubic meter
Opacity	10%

A complete set of quarterly emission reports for 2015 are available at the Metro Vancouver web site (Metro Vancouver 2015a). After conversion from metric to English units the annual quantity of CO, NO_X and SO_2 emitted by Lehigh in 2015 is shown below in Table 19. Emission reports from 2009, 2010, and 2011 are available on Metro Vancouver's website; however, they are not included in Table 19 due to incomplete and unavailable data and differences in report types (stack quarterly reports versus continuous emission monitoring reports). Emission reports were not available on the Metro Vancouver website for years 2012, 2013, and 2014.

Table 19 provides a conservative estimate of emissions that would result from burning PCCC coal in any of the proposed cement plants, lime kiln, or pulp mill. It excludes emissions related to the raw fuel mix. The emissions presented in Table 19 are more significant than fuel combustion at the Lehigh Cement plant because the total amount of coal produced under the Proposed Action Alternative would exceed Lehigh's capacity to burn in a given year which in 2015 was 1,124,681 pounds of coal per year. Emissions from the Lehigh Cement Plant are not anticipated to lead to pollutant concentrations that would violate the British Columbia Ambient Air Quality Standards or impair regional air quality conditions (*see* Table 12).

Table 19. Current Lehigh Cement Plant Emissions versus Emissions from the Proposed Action in Relation to the Study Area

Pollutants (tons/year)	Lehigh Cement Plant, *Delta*, BC (2015)	John Henry No. 1 Mine Indirect Emissions	Emissions by County (tons per year)					
			King County (2011)	Snohomish County (2011)	Pierce County (2011)	Kitsap County (2011)	Washington (2011)	Lower Fraser Valley, BC (2010)
CO	1,104	1,344	362,939	149,472	157,226	55,214	1,736,782	353,760
NO_X	2,682	1,050	60,583	22,322	24,801	6,976	285,900	60,410
SO_2	60	84	2,461	687	1,197	684	27,964	12,090
PM[1]	1,933	N/A	10,666	4,559	4,146	1,598	73,173	7,570

N/A = Not Reported

Sources: Metro Vancouver 2013b and 2015a, WDOE 2016a

[1] Emissions by county for PM are reported as PM2.5 and PM value from Lehigh are presented in µg/m3.

CO, NO_X, and SO_2 emission standards in the Puget Sound region are all well below Federal standards according to PSCAA (2014). Indirect impacts from burning PCCC's coal in varying quantities are negligible and short-term because emission levels from the John Henry No. 1 Mine under the Proposed Action Alternative would account for <1 percent of current emissions within the indirect impact study area whose counties are all currently in attainment and based on the short-term duration of the Proposed Action (seven years total).

3.6.2.1.1.2.1 Mercury

The Lehigh Cement Plant is required to provide reports of the measured discharge rate and concentration of Mercury emissions every three months. The maximum concentration allowed is 0.15 mg/m^3. This restriction does not apply to the duration of startup, shutdown, or unavoidable upset conditions. According to the most recent monitoring report in October 3, 2015, the current concentration of mercury emitted at the plant averages 0.01 mp/m3, which is well below the contaminant permit limit.[10] Mercury emissions would be negligible and short-term because the use of coal from the John Henry No. 1 Mine would not increase overall coal combustion rates at the plant (Lehigh Cement Plant Monitoring Report 2015). The plant would be required to report and correct any and all violations in adherence with their permit stipulations as soon as possible. It is assumed for purposes of this analysis that coal from the John Henry No. 1 Mine combusted at other facilities would have similar air quality impacts to that of the Lehigh Cement Plant due to similar or smaller plant size (ex. Ash Grove Cement Plant is similar and Lafarge is smaller).

3.6.2.2 No Action Alternative

3.6.2.2.1 Direct Impacts

Table 16 presents total emissions for the No Action Alternative showing that they are less than the emissions associated with the Proposed Action Alternatives across all criteria and hazardous pollutants (*see* Section 3.6.2, *Proposed Action*). The effects of operational emissions from reclamation activities under the No Action Alternative would be temporary and at any given time would occur only where operations are occurring. The effects of operational emissions on ambient air quality would vary with time due to the operational schedule, mobility of emission sources, type of equipment in use, and local meteorological conditions. Operational emissions under the No Action Alternative are not anticipated to lead to pollutant concentrations that would violate the NAAQS or impair regional air quality conditions.

The No Action Alternative reclamation plan requires longer haul distances and a larger mobile equipment fleet for haulage of backfill and topsoil materials for final reclamation than the Proposed Action Alternative. The haul profile from Spoil Pile 3N and 3S to Pit 1 is entirely above

[10] Mercury emission monitoring data is not available for quarters and years and therefore the EA presents the most recent data available.

the pit perimeter and would average 2,400 feet and 2,800 feet respectively. Under the Proposed Action Alternative, the distances are 200 feet and 600 feet respectively into Pit 2. Fugitive dust emissions associated with the No Action Alternative would be less than that modeled by PSCAA for mining but could represent a small increase compared to reclamation activities associated with the Proposed Action Alternative. The Proposed Action Alternative uses dozers and has shorter hauls than the No Action Alternative. Fugitive dust from long truck or scraper hauls would be controlled with water spray trucks during dry conditions. These emissions were not modeled by OSMRE in the FEIS (OSMRE 1985) nor by PSCAA in the NOC Worksheet (PSCAA 2010).

Impacts on air quality from the No Action Alternative would generally occur within the permit area but also potentially could be local. The direct impacts would be short-term and negligible due, in part, to the fact that prevailing winds in the dry summer months are from the W and NW and the land use to the SE is managed forest with no residential development existing or planned (PSCAA 2010). The coal washing plant would not operate therefore additional PM emission would be eliminated (aside from those presented in Table 17).

Under the No Action Alternative, the coal processing plant would not be operated and no emissions would occur from that source. No coal mining would take place so emissions from mining or coal combustion would not occur. Therefore impacts would be negligible and short-term.

3.7 Soils

3.7.1 Affected Environment

Soils within the mine site are similar to surrounding areas and are well-developed to support vegetation given the relatively large amount of rainfall. There is no historical use of the soil for cropland although some of the soil units located within the Mud Lake wetlands have potential for cropland. These soils will not be disturbed by mining and reclamation under the Proposed Action Alternative or by the No Action Alternative. To be considered Prime Farmland it must have a historical use as cropland as well as be the appropriate soil type. Soils that will be disturbed under the Proposed Action Alternative have neither characteristic. In 2015 OSMRE consulted with the Natural Resources Conservation Service (NRCS) concerning the potential for occurrence of Prime Farmland soils within the permit boundary. NRCS concurred with OSMRE's determination that the property contained no "Prime Farmland" as that term is defined in the regulations which require it to have a historic land use of cropland. Because the site is located in Western Washington it is not subject to "Alluvial Valley Floor" regulations at 30 CFR § 947.701(b)(1). Most of the soils on the site have a well-developed upper or "A" horizon that is high in organic matter and ranges from 1-2 feet in thickness (OSMRE 1985). Prior to mining operations commencing in 1986, soils were mapped by a King County Conservation District

representative. The applicant performed additional sampling and analysis of the soil resource to supplement the earlier work.

Prior to beginning mining in 1986, PCCC undertook a soil descriptive and analytical program to supplement the soil inventory efforts. This is described in more detail in Chapter VII of the PAP. Plate VII-1 in the PAP provides a map of the soils prior to initial mining (PCCC 2011a). This includes the 29.7 acres proposed for disturbance under the Proposed Action Alternative. Samples were taken from soil profiles in areas to be disturbed during the mining operation. The samples collected were representative of dominant horizons in these soils. The analytical studies indicated no major limiting chemical or physical characteristics.

Soils that would be disturbed under the Proposed Action Alternative are predominantly classified as Alderwood Gravelly Sandy Loam. This soil is well-drained and has slight-to-moderate erosion potential. This soil is well-suited for the post mining land uses of forestry. Wetland soils include the Seattle and Norma series. These would not be disturbed by future mining and reclamation activities.

Topsoil in the previously disturbed area has been removed and either stockpiled or re-spread in the backfill area of Pit 1 or on the spoil piles.

The overburden units of the Puget formation consist of sandstone, shale, and siltstone. This is overlaid by Vashon till that is irregular in thickness. The till is mostly consolidated and compressed sand and gravel with a clay matrix. Small pockets of unconsolidated sand and gravel are sometimes encountered. No toxic microelements or acid forming materials were encountered during past mining.

3.7.2 Environmental Consequences

In 1986, there was concern over the productivity of topsoil that was removed ahead of mining and then stored. This is no longer a concern as alder trees, which are nitrogen fixing, have grown over the major topsoil stockpile. Such topsoil was both stored and was also applied directly over the temporary spoil piles to prevent erosion. Native vegetation has been established on the stored topsoil piles and Douglas fir was planted on the external spoil piles for additional erosion control. Native vegetation has also established itself on disturbed land where topsoil was removed. This includes 8 acres that will be re-disturbed by mining and that are included in the 29.7 acre mining area. Commercially harvestable trees would be removed by the landowners from the spoil piles and topsoil piles as required to complete final reclamation. The remaining vegetation would be cleared and grubbed to the extent necessary to allow reclamation in accordance with the approved plan.

Under the Proposed Action Alternative topsoil and subsoil would be directly hauled, redistributed and re-vegetated, and would not be stored or stockpiled. Approximately one to two feet of topsoil would be removed and directly applied to disturbed areas that have been graded;

topsoil would be handled to preserve its integrity; and topsoil would be tested, if necessary, to determine if nutrients and amendments are required. Depths are determined by the operator during topsoil removal based on field observations. When topsoil depths exceed 2 feet then the entire topsoil horizon is removed and redistributed (Morris 2015). Re-vegetation monitoring is planned to determine if nutrients or amendments are required. Stored topsoil has not been comingled with coal processing wastes. Care would continue to be taken not to mix topsoil with coal mining wastes during redistribution by covering coal processing wastes with at least 3 feet of overburden or clean soil before covering with 1 foot of topsoil.

Before mining began in 1986 the King County Conservation District representative, Mr. Robert Gavenda, indicated that the soil in the area of Mud Lake as shown on the Natural Resources Conservation Service map consists of Seattle Muck surrounded by a ring of Norma sandy loam. Both of these soils are considered to be prime farmland soils if the water table is deeper than 1.5 feet below ground surface during the cropping season (Gavenda 1981). However, the area does not have a historical land use as cropland. Because Mud Lake wetland remains undisturbed, disturbance of Norma sandy loam and Seattle Muck would also not occur under the Proposed Action Alternative.

Long-term storage of topsoil in piles may deteriorate chemical and microbiological properties of soils. In particular long-term storage may negatively impact the mycorrhizal potential of the soil. This is a symbiotic association between the roots of plants and specialized fungi. If the results of initial seeding indicate a need, the applicant will conduct a soil fertility sampling program after topsoil redistribution and add necessary fertilizer as recommended and or plant with mycorrhizal inoculated seedlings to insure re-vegetation success (Quam 1983). PCCC's reclamation plan specifies that it will plant 538 Douglas fir seedlings per acre (PCCC 2011a). The performance based success standard, in accordance with Washington State Forest Practice Regulations is survival of 190 stems per acre in place after five years (WAC-34-10).

3.7.2.1 Proposed Action Alternative

Under the Proposed Action Alternative, an additional 29.7 acres would be disturbed by mining. When present, topsoil would be removed ahead of mining and immediately redistributed to areas in Pit 1 and Pit 2 that have been backfilled and graded. No additional topsoil stockpiles are proposed. As Pit 2 advances, Spoil Pile 2 would be dozed into Pit 2 and the topsoil stockpiled on top of Spoil Pile 2 would be distributed over the spoil pile once it reaches AOC. Topsoil would be placed primarily during the drier summer months. This would only occur if additional topsoil must be removed to allow mining to advance. Handling wet topsoil is more costly than handling dry topsoil. Depending on weather and seasonal conditions, replaced topsoil would be immediately seeded with a grass mixture and then planted with Douglas fir the following year. Topsoil in existing stockpiles would be utilized for final reclamation and all areas would be reclaimed using either suitable material or topsoil. Impacts are confined within the permit area and would constitute a moderate, long-term impact to soils that would be disturbed under the Proposed Action Alternative due to changes in the properties, structure, and

appearance. Soil impacts would be restricted to the mine permit area and would not result in any indirect impacts.

3.7.2.2 No Action Alternative

No additional topsoil would be removed under the No Action Alternative as no mining would take place. All topsoil needed to reclaim the mine site would come from the topsoil stockpiles or topsoil that is currently applied on the external spoil piles. Impacts on soil resources, such as reduced soil productivity, under the No Action Alternative are confined within the permit area, would be negligible and short-term but would occur sooner (over two years) than the Proposed Action Alternative (six years for mining operation and one year to complete reclamation). Soil impacts would be restricted to the mine permit area and would not result in any indirect impacts.

3.8 Vegetation

3.8.1 Affected Environment

The vegetation cover type for the area where the John Henry No. 1 Mine is located has been mapped as Western Hemlock Zone (Franklin and Dyrness 1973). This vegetation zone historically covered much of Western Washington. Western hemlock, Douglas fir, and western red cedar typically dominate old-growth forests in the Puget Sound region. Nearly all of the Western Hemlock Zone, including the John Henry No. 1 Mine, has been altered by timber harvests. Current conditions throughout the Puget Sound region consist primarily of a mixture of even-aged Douglas fir forests and developed lands (WRI 2008).

In 1981 PCCC contracted with what was then Washington Department of Game (WDG), to conduct a flora and fauna study to be used in the SEPA EIS (WDG 1981). The flora survey was included as Appendix 8 of the SEPA EIS (King County Department of Planning and Community Development 1984). This study also served as a basis for the NEPA EIS (OSMRE 1985). The entire study, including field notes, can be found as Appendix VIII-1 of the PAP (PCCC 2011a).

In 1991, as required by the State of Washington Growth Management Act (GMA), the City of Black Diamond commissioned a Fish and Wildlife - Critical Areas Inventory of lands located within the city, including those that are also part of the John Henry No. 1 Mine (David Evans and Associates, Inc. 1991). This study divided the habitat types within the City of Black Diamond into five distinct groups: Aquatic Areas; Wetlands; Unforested Open Areas; Managed Forested Areas; and Unmanaged Forested Areas. This study identified unique habitat areas that provide special functions for fish and wildlife. These are designated as wildlife corridors and included Ginder Creek corridor, Mud Lake Creek corridor, and adjacent riparian areas.

Group Four Inc. (2011) completed a wetland delineation study in November 8, 2011, which included a vegetation survey of the entire mine site including the upland areas. A list of observed plants was included as Table D-1 and is included herein as Appendix D, *Vegetation*.

Classification of upland plant communities present on the site are based primarily on the King County Wildlife Habitat Profile (King County 1987). The King County system was chosen because of its high applicability to habitats local to the Puget Sound region, which cover the John Henry No. 1 Mine and was used in the recent EIS's discussed above.

Vegetation communities and cover types are also identified by the Northwest Regional Gap Analysis Project (NWReGAP) (USGS 2016) and are described in more detail for the specific project components in Appendix D, *Vegetation*. Table 20 provides a summary of the 10 vegetative communities contained within the 480-acre permit area (see also Figure 12). Table 21 provides a list of Federal and State listed threatened, endangered, and sensitive plant species in King County, WA.

Figure 12. Vegetation and Reclamation

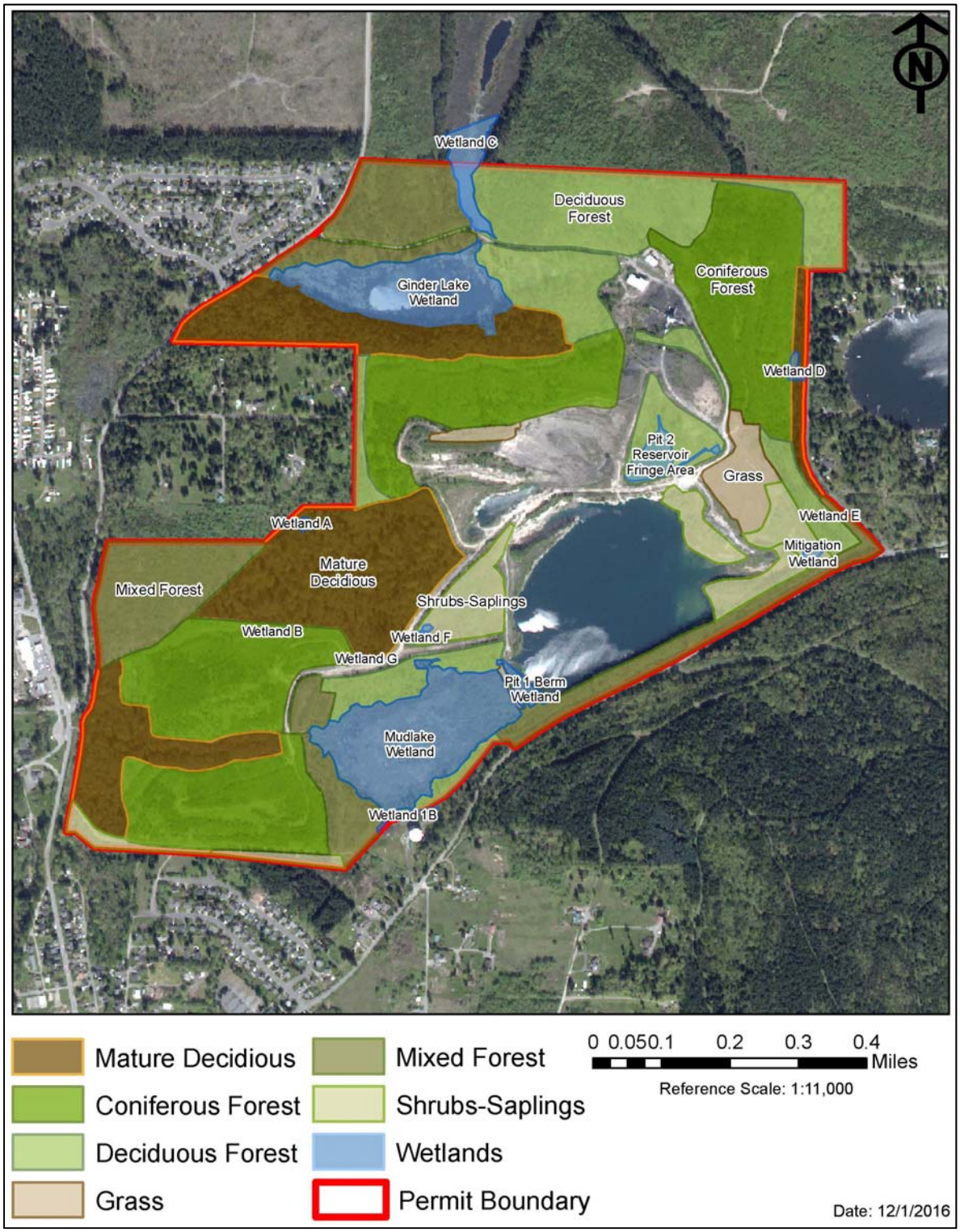


Table 20. Summary of Vegetative Communities

Vegetative Type	Symbol	Area (Acres)
Coniferous Forest	Fc	101.5
Deciduous	Fd	60.9
Mature Deciduous	Fd-m	76.0
Mixed Forest	Fm	52.3
Shrub/Saplings	Fs	22.0
Grass	Gu	8.7
Open Water	Pw	36.0
Mine/Disturbed	M	65.6
Wetlands	Fw	45.2
Sediment Ponds	Ps	11.8
Total Area		480.0

Table 21. Federal and State Listed Endangered, Threatened, and Sensitive Plants in King County, WA

Scientific Name	**Common Name**	**State Status**	**Federal Status**	**Habitat**	Refer. -1	**Rationale For Dismissal from Further Analysis**
Arenaria paludicola	swamp sandwort	X	LE	Wetlands swamp. No known occurrences in WA	56	Limited disturbance of wetlands, no known occurrences in WA
Bidens amplissima	Vancouver Island beggar-ticks	R1		Wetlands, swamp near coast	-2	Limited disturbance of wetlands, not near coast
Boschniakia hookeri	Vancouver ground-cone	R1		Gross stands of salal near saltwater. Elevation in WA 120-500 ft.	-3	Mine elevation 625 - 950 ft, no nearby saltwater
Botrychium ascendens	triangular-lobed moonwort	S	SC	Forests, wet and dry meadows, rocky soils, next to perennial streams, 2,100-6,400 ft elevation	26	Mine elevation 625 - 950 ft

Scientific Name	Common Name	State Status	Federal Status	Habitat	Refer.	Rationale For Dismissal from Further Analysis
Botrychium pedunculosum	stalked moonwort	S	SC	Moist or dry meadows, riparian forests.1640-4340 ft elev	31	Mine elevation 625 - 950 ft
Brotherella roellii	Roll's golden log moss	T		Old logs, base of red alder, low elevations, open mixed forests of floodplains, stream terraces and valley margins	19	Unsuitable habitat. No floodplains, stream terraces of valley margins.
Campanula lasiocarpa	Alaska harebell	S		Rock crevices, high elevation, 2,000-6,840 ft	79	Mine elevation 625 - 950 ft
Carex comosa	bristly sedge	S		Marshes, lake shores, wet meadows	289	Limited disturbance of wetlands or lakes. Not observed in 2011 vegetative survey
Carex macrochaeta	large-awned sedge	T		Seepage areas, wet meadows, streams, lakes, elevation in WA 1,200-3,200 ft	294	Mine elevation 625 - 950 ft
Carex pauciflora	few-flowered sedge	S		Sphagnum bogs, acidic peat	298	Limited disturbance of wetlands or lakes. Not observed in 2011 vegetative survey.

Scientific Name	Common Name	State Status	Federal Status	Habitat	Refer.	Rationale For Dismissal from Further Analysis
Carex stylosa	long-styled sedge	S		Wet meadows, wetlands, rock, elevations in WA 2,760-5,200 ft	303	Mine elevation 625 - 950 ft
Cassiope lycopodioides	clubmoss cassiope	T		Rock faces, high elevations 1,900-2,200 ft in WA	80	Mine elevation 625 - 950 ft
Castilleja levisecta	golden paintbrush	E	LT	Grasslands, does not tolerate closed canopy, elevations in WA 10-300 ft	82	Mine elevation 625 - 950 ft
Ceratophyllum echinatum	smooth hornwort	R1		Aquatic	-4	Limited disturbance of lakes or wetlands. Not observed in 2011 vegetative survey
Chrysolepis chrysophylla var. chrysophylla	golden chinquapin	S		Prairies, forests, one location in WA	85	Unsuitable habitat, no prairies

Scientific Name	Common Name	State Status	Federal Status	Habitat	Refer.	Rationale For Dismissal from Further Analysis
Cimicifuga elata	tall bugbane	S	SC	Old growth forests	88	Unsuitable habitat, no old growth forests
Coptis aspleniifolia	spleenwort-leaved goldthread	S		Moist cool old forests, riparian areas. Mostly found along coast or in North Cascades.	94	Unsuitable habitat, no old growth forests
Elodea nuttallii	Nuttall's waterweed	R1		Wetlands	-5	Limited disturbance to wetlands. Not observed in 2011 vegetative survey.
Fritillaria camschatcensis	black lily	S		Wet meadows, wetlands, riparian	317	Limited disturbance to wetlands. Not observed in 2011 vegetative survey.
Heterotheca oregona	Oregon goldenaster	T		River sand and gravel bars at higher elevations in WA above 2,600 ft.	147	Mine elevation 625 - 950 ft and unsuitable habitat

Scientific Name	Common Name	State Status	Federal Status	Habitat	Refer.	Rationale For Dismissal from Further Analysis
Hypericum majus	Canadian St. John's-wort	S		Wetlands	150	Limited disturbance to wetlands. Not observed in 2011 vegetative survey.
Lathyrus vestitus var. ochropetalus	Pacific pea	E		Dry wooded forest edges. Elevation in WA 250-565 ft	156	Mine elevation 625-950 ft.
Lobelia dortmanna	water lobelia	T		Aquatic	159	Limited disturbance to wetlands. Not observed in 2011 vegetative survey.
Lycopodiella inundata	bog clubmoss	S		Wetlands	36	Limited disturbance to wetlands. Not observed in 2011 vegetative survey.
Lycopodium dendroideum	treelike clubmoss	S		Wet rock outcrops, ecotone between meadow and wetland	37	Limited disturbance to wetlands. Not observed in 2011 vegetative survey. No meadows.

Scientific Name	Common Name	State Status	Federal Status	Habitat	Refer.	Rationale For Dismissal from Further Analysis
Meconella oregana	white meconella	E	SC	Open grasslands to open forestland. Elevations in WA 60-620 ft	172	Mine elevation 625-950 ft. No permanent grasslands or open forestland.
Montia diffusa	branching montia	S		Douglas-fir forests. Elevations in WA 850-2,900 ft.	183	Grows at higher elevations. Not identified on 2011 vegetation survey
Nuttallanthus texanus	Texas (blue) toadflax	S		Glacial outwash, prairies with well drained soils. Elevations in WA 16-200 ft	187	Mine elevation 625-950 ft. No glacial outwash or prairies.
Platanthera chorisiana	Choris' bog-orchid	T		Wetlands. Elevations in WA 2,540-4,300 ft.	327	Limited disturbance of wetlands. Mine elevation 625-950 ft.
Racomitrium aquaticum	aquatic racomitrium moss	R1		Moist conditions. Elevation in WA 2,000-6,400 feet.	-6	Mine elevation 625 - 950 ft.

Scientific Name	Common Name	State Status	Federal Status	Habitat	Refer.	Rationale For Dismissal from Further Analysis
Schistostega pennata	luminous moss	R1		Occurs on mineral soil in crevices on the lower and more sheltered parts of the root mass of fallen trees. It also has been found on soil around cave entrances.	-7	No caves. Will not disturb mature deciduous forests with root mass of fallen trees.
Sericocarpus rigidus	white-top aster	S	SC	Open grasslands. Elevations in WA 30-550 ft	255	Mine elevation 625-950 ft.
Utricularia gibba	humped bladderwort	R1		Aquatic. Elevations in WA 160-490 ft	-8	Mine elevation 625-950 ft.
Utricularia intermedia	flat-leaved bladderwort	S		Wetlands, aquatic	273	Limited disturbance to wetlands. Not observed in 2011 vegetative survey.

Notes:
State Status

State Status of plant species is determined by the Washington Natural Heritage Program. Factors considered include abundance, occurrence patterns, vulnerability, threats, existing protection, and taxonomic distinctness. Values include:
E = Endangered. In danger of becoming extinct or extirpated from Washington.
T = Threatened. Likely to become endangered in Washington.
S = Sensitive. Vulnerable or declining and could become endangered or threatened in the state.
X = Possibly extinct or extirpated from Washington.
R1 = Review group 1. Of potential concern but needs more field work to assign another rank.
R2 = Review group 2. Of potential concern but with unresolved taxonomic questions.

Federal Status

Federal Status under the U.S. Endangered Species Act (ESA) as published in the Federal Register:
LE = Listed endangered. In danger of extinction.
LT = Listed threatened. Likely to become endangered.
PE = Proposed endangered.
PT = Proposed threatened.
C = Candidate species. Sufficient information exists to support listing as endangered or threatened.
SC = Species of Concern. An unofficial status, the species appears to be in jeopardy, but insufficient information to support listing.

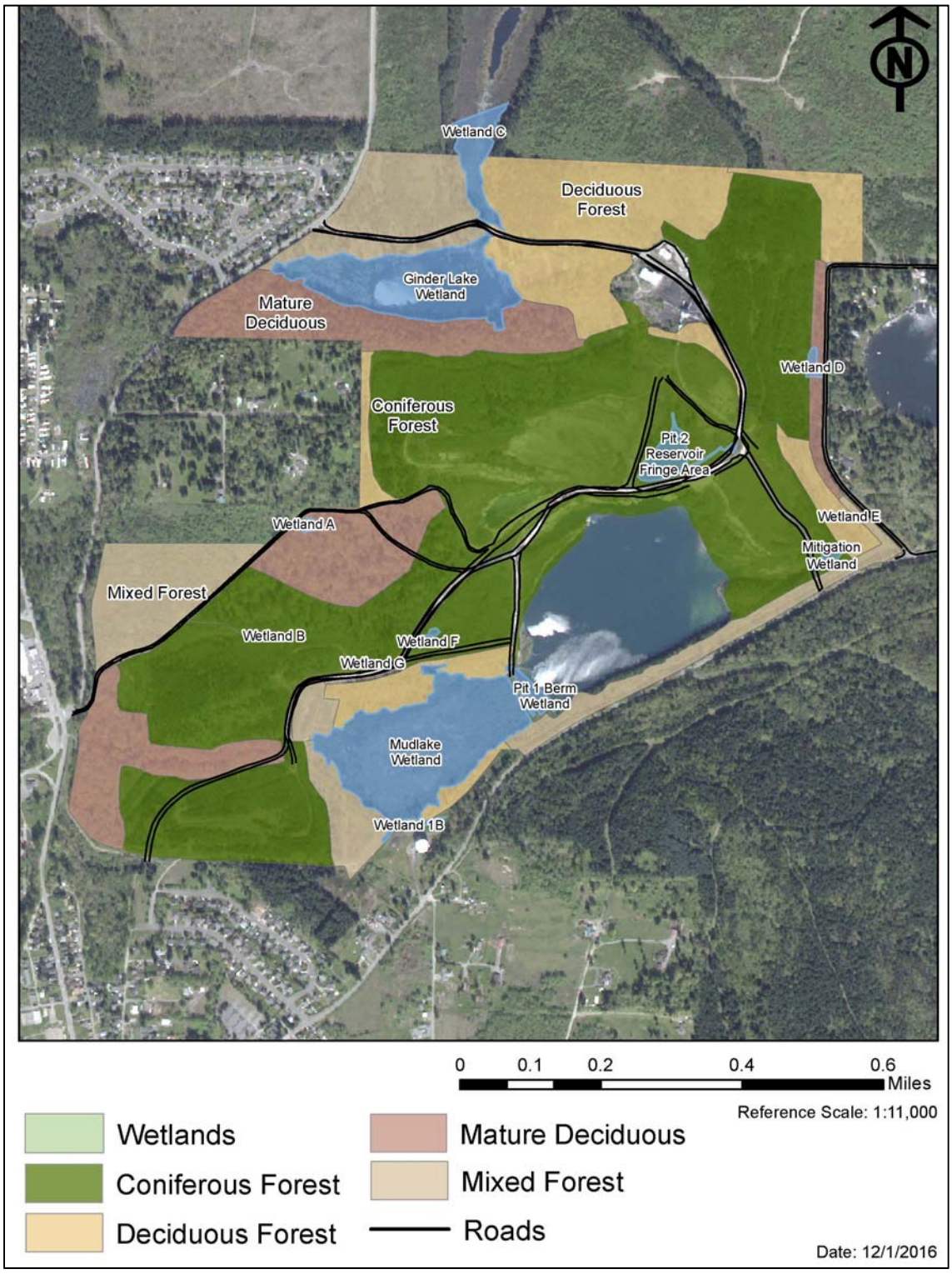
References

(1) The primary reference is Department of Natural Resources, Field Guide to the Rare Plants of Washington (WDNR 2011). Page numbers are shown except for numbers in parentheses with corresponding references: (2) Klinkenberg 2015; (3) WDNR 2003; (4) Naturalist.org 2016; (5) USDA 2013; (6) BLM 1996; (7) USFS 2005; (8) WDNR 2005.

3.8.2 Environmental Consequences

Approximately 29.7 acres of vegetation clearing and removal would occur as a result of continued mining under the Proposed Action. All vegetation removal would consist of mature deciduous forest and would occur within the permit boundary for the John Henry No. 1 Mine. During reclamation under either alternative, the disturbed areas would be backfilled and graded to AOC. The John Henry No. 1 Mine would be reclaimed in accordance with the currently approved reclamation plan. Following final grading, topsoil will be redisturbed uniformly over areas disturbed by mining to an average depth of approximately one foot. Seeding will be accomplished via broadcast (i.e. hand spreader; helicopter, and/or mobile equipment (i.e. dozer) within 30 days following topsoil placement. Douglas Fir seedlings would be planted at approximately 538 stems per acre. Red alder is expected to establish naturally forming mixed stands with Douglas fir (Figure 13). All active sites disturbed during construction or mining will be seeded to temporary cover crops (PCCC 2011a).

Figure 13. Post-Mining Vegetation & Reclamation Map



3.8.2.1 Proposed Action Alternative

Under the Proposed Action Alternative, vegetation would be disturbed by mining and reclamation activities. The primary long-term and short-term impacts to vegetation would be from the removal of mature deciduous trees as a result of the continued mining of coal at the John Henry No. 1 Mine. Because of the high precipitation and large propagule pressure[11], herbaceous colonizing species become established relatively quickly (approximately two years for 70-100% cover). However, for the expected time of recovery starting from bare-ground is within 10-15 years, Douglas fir is expected to completely occupy the site following plantings (i.e. planting 538 stems per acre). For the forest industry, tree thinning is recommended at 35 years and final harvest start at age 45, 55, or 65 years. Potential impacts would be minor and long-term and would be limited to areas disturbed by proposed mining and reclamation with no changes in the plant community structure or composition elsewhere within the permit boundary.

The Proposed Action Alternative would result in an increased amount of wind-borne fugitive dust. Indirect impacts to surrounding vegetation would occur from the fugitive dust released due to proposed mining activities. Fugitive dust negatively impacts nearby vegetation by coating leaves reducing photosynthetic activity. PCCC would implement dust suppression measures on mine roads which would minimize impacts to surrounding vegetation from fugitive dust therefore potential impacts would be negligible and long-term.

3.8.2.2 No Action Alternative

Under the No Action Alternative, there would be no need to clear and remove vegetation from the 29.7 acres proposed for coal mining. However, under the No Action Alternative, there would continue to be direct impacts to vegetation from surface disturbance as reclamation actions are completed in accordance with the approved reclamation plan. Vegetation would be cleared from the external spoil piles used to achieve AOC as part of the reclamation plan, the impacts of which were analyzed in Section 3.7.1, *Affected Environment*. Potential impacts would be minor and long-term and would be limited to areas disturbed by reclamation with no changes in the plant community structure or composition elsewhere within the permit boundary. There would be no indirect impacts to vegetation as a result of the No Action Alternative as proposed mining activities would not occur.

3.9 Wetlands and Riparian Zones

3.9.1 Affected Environment

The Army Corps of Engineers (USACE) and EPA have defined wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically

[11] a composite measure of the number of individuals of a species released into a region to which they are not native

adapted for life in saturated soil conditions" (EPA 2017). According to the FEMA flood zone online mapping tool, there are no floodplains present within the permit boundary (FEMA 2016).

Group Four Inc. completed a wetland delineation study September 1, 2011. This was required by the USACE before it could issue a Nationwide 21 permit or require a Clean Water Act (CWA) Section 404 individual permit (Gresham 2011). The survey identified 11 wetlands within the permit area not including the sediment control ponds. These are discussed in more detail in Appendix E and summarized in Table 22 with their locations shown on Figure 12.

The study showed three small wetlands had established themselves within the disturbed area after mining temporarily ceased in the late 1990's. Following review of the September 2011 wetland delineation study, the USACE requested additional information from PCCC. Group Four Inc. completed supplemental field work in November 2011, revised the study and identified two additional wetlands that had been established in previously disturbed mine areas (Group Four 2011). The 45.22 acres of wetlands that were delineated in the study include five wetlands totaling 3.72 acres that have developed on areas previously disturbed by mining. These five wetlands would be eliminated under the currently approved reclamation plan under the Proposed Action and No Action Alternatives. Any future requirements or permit renewals would occur between the Operator and USACE. *See* Appendix C, *Consultation*.

Table 22 presents the identified wetlands on the John Henry No. 1 Mine and their classifications. More detail on the wetland characteristics is provided in Appendix E, Wetlands and Riparian Zones.

Table 22. Wetland Classification Summary

Wetland/Open Water Name	Size (acres)	Cowardin Class[1]	Hydrogeomorphic Class[2]	Ecology Category[3]
Mud Lake	22.74	PEM[4]/PSS[5]/PFO[6]	Depressional	II
IB Wetland	0.33	PEM	Slope	IV
Pit 1 Berm	1.14	PEM/PSS	Depressional	III
Pit 2 Fringe	2.19	PEM/PSS	Depressional	III
Wetland A	0.22	PSS	Depressional	III
Wetland B	0.06	PEM	Slope	IV
Ginder Lake	15.99	PUB[7], PEM, PSS, PFO	Depressional	I
Wetland C	1.54	PUB, PEM, PSS, PFO	Depressional	I
Wetland D	0.36	PEM/PSS	Slope	III
Wetland E	0.01	PSS	Depressional	III
Wetland F	0.30	PSS/PEM	Depressional	III
Wetland G	0.03	PSS	Depressional	IV
Wetland Mitigation	0.31	PSS/PFO	Depressional	III

Notes:

[1]Cowardin et al. (1979).

[2]Hydrogeomorphic classes according to Brinson (1993). Depressional wetlands typically occur in topographic depressions and whose water sources are precipitation, ground water discharge, and both interflow and overland flow from adjacent uplands. Slope wetlands normally are found where there is a discharge of ground water to the land surface. They normally occur on sloping land; elevation gradients may range from steep hillsides to slight slopes. Principal water sources are usually ground water return flow and interflow from surrounding uplands, as well as precipitation (NRCS 2008).

[3]Wetland category according to Washington Department of Ecology (Hruby 2004). The criteria for assigning points to categories changed in 2014 effective January 1, 2015 although the categories remain the same. The January 1, 2015, effective date means that if a wetland is rated on or after that date, the 2014 updates are required for projects needing Ecology authorization according to the updated Washington State Wetland Ratings System (WDOE 2014b).

[4]PEM - palustrine emergent

[5]PSS - palustrine scrub/shrub

[6]PFO - palustrine forested

[7]PUB - palustrine unconsolidated bottom

3.9.1.1 Open Water (Pw)

Mud Lake and Ginder Lake are classified as wetlands and both, especially Ginder Lake, are comprised partly of open water. Under the Proposed and No Action Alternative, neither wetland would be disturbed by mining or reclamation activities.

3.9.1.1.1 Ginder Lake Wetland (15.99 acres)

Ginder lake wetland is an open water wetland complex located at the northwest edge of the mine site. This wetland is bordered on the west by Black Diamond-Ravensdale Road, on the north by SE Ginder Lake Road, and on the east by storm water Pond B. The Ginder Lake Wetland is hydrologically connected to Wetland C on the north side of SE Ginder Lake Road and is part of a larger wetland system that extends off-site to the north. Ginder Lake is considered wetlands "aquatic habitat" priority area and the surrounding area is considered "regular concentration" priority area for Elk (*Cervus elaphus*) by WDFW. Under the Proposed Action and No Action Alternatives, this wetland would not be disturbed by mining or reclamation activities. This large wetland has permanent open water with submerged macrophytes, a shoreline dominated by emergent plants, and a fringe of scrub/shrub and forested vegetation on higher ground. Plant species in the open water and emergent areas include yellow pond lily, floating-leaved pondweed, cattail, woolly sedge, soft stem bulrush (*Scirpus tabernaemontanii*), marsh cinquefoil (*Potentilla palustris*), narrow-leaved burreed, reed canarygrass, small-fruited bulrush, skunk cabbage, tapertip rush, broadleaf water plaintain, daggerleaf rush, horsetail sedge (*Dulichium arundinaceum*), and bigleaf sedge (*Carex amplifolia*).

Trees bordering the shoreline of Ginder Lake include western red cedar, red alder, black cottonwood, Pacific willow, and cascara. The shrub understory includes Sitka willow, hardhack, salmonberry, vine maple, black twinberry, and Devil's club. Invasive plants near the wetland boundary include Himalayan blackberry, evergreen blackberry, Cascade mountain ash, holly, and Japanese knotweed (*Polygonum cuspidatum*).

3.9.1.1.2 Wetland C (1.54 acres)

Wetland C is a linear depression located at the northern edge of the mine site that extends offsite to the north. Wetland C is hydrologically connected to Ginder Lake by a culvert underneath the roadway. The wetland boundary on both the east and west edges is defined by steep slopes that are covered with second-growth upland forest. Under the Proposed and No Action Alternative, this wetland would not be disturbed by mining or reclamation activities. Wetland C contains standing water with submerged macrophytes, emergent, and scrub/shrub vegetation. Wetland C is considered priority wetland aquatic habitat as well as priority habitat for Elk (Cervus elaphus) "regular concentration". The open water area contains yellow pond lily and floating-leaved pondweed, while the emergent area includes reed canarygrass, skunk cabbage, lady fern (*Athyrium filix-femina*), cattail, and field horsetail. Higher on the banks of this depression there are shrub thickets that include Sitka willow, vine maple, hardhack, black twinberry, salmonberry, and Himalayan blackberry. On the highest ground near the wetland boundary there are trees such as, black cottonwood, red alder, Pacific willow, Sitka spruce (*Picea sitchensis*), and western red cedar.

3.9.1.1.3 Sediment Ponds

Stormwater runoff from disturbed area flows through one of six (i.e. A, A', B, F, I, H_1, H_2) sediment control ponds (12 acres). Sediment ponds are not considered to be waters of the U.S. by the USACE. The sediment ponds would be removed under the approved reclamation plan for the Proposed and No Action Alternatives. However, it should be noted all sediment control ponds have wetland characteristics. Sediment control Pond B is scheduled to be filled, graded, and planted with Douglas fir in accordance with the approved final reclamation plan (PCCC 2011a).

3.9.1.1.4 Streams

Mud Lake Creek flows approximately 1,800 feet from the northwest corner of Mud Lake to the mine boundary near State Route (SR) 169. The wetted channel averages 3 feet wide and 2 inches deep and is located in a steep ravine. Ginder Creek flows from the southwest corner of Ginder Lake to the mine boundary near Black Diamond – Ravensdale Road. The wetted channel averages 4 feet wide and 3 inches deep and parallels Black Diamond – Ravensdale Road (Group Four 2011). Group Four (2011) determined Mud Lake Creek and Ginder Creek are Waters of the United States (WOTUS). Under both the Proposed Action Alternative and No Action Alternative, Ginder Creek would not be disturbed by mining or reclamation activities. Impacts to Mud Lake wetlands from mining activities on adjacent lands would be minimal. Water from pit 1 will be pumped into I-pond during the winter months. Water would be released into Mud Lake post-mine.

3.9.2 Environmental Consequences

Apart from Ginder and Mud Lakes, thirteen wetlands have been identified at the John Henry No. 1 Mine. The Pit 2 Fringe, B, F, and G wetlands totaling 2.58 acres would be eliminated as a result of continued mining under the Proposed Action. All of the wetlands that would be eliminated are located within the permit boundary of the mine. During reclamation, the disturbed areas would be backfilled and graded to AOC. The balance of the property will be reclaimed in accordance with the currently approved reclamation plan (PCCC 2011a).

After reviewing PCCC's Pre-Construction Notice (PCCC 2011b) supported by the Wetland Delineation Study (Group Four 2011), the Army Corps of Engineers (USACE) determined that PCCC could continue to operate under a Nationwide permit 21 (USACE 2013). PCCC would continue to operate in accordance with the requirements of the USACE Nationwide permit 21. Any additional permit requirements or renewals would be coordinated between PCCC and USACE, *see* Appendix C, *Consultation*.

3.9.2.1 Proposed Action Alternative

Under the Proposed Action, non-jurisdictional wetlands would be disturbed and/or eliminated by mining and reclamation activities. Potential impacts would be limited to areas disturbed by proposed mining and reclamation with no changes in the plant community structure or composition elsewhere within the permit boundary. No wetlands outside the permit boundary of the mine would be affected. Under the Proposed Action, there would be no direct, adverse

impacts to streams and riparian zones as the proposed mining activities would not disturb these areas within the permit boundary. Under the Proposed Action, potential impacts to wetlands within the permit boundary would be minor and long-term.

Indirect impacts from the Proposed Action Alternative include fugitive dust and coal dust deposition on wetlands and riparian zones from coal hauling vehicles leaving the permit area. Wheel washes will be used prior to trucks exiting the permit area to reduce mud and dust on the roads and the coal truck beds will be covered to reduce coal particles. Under the Proposed Action, there would be no indirect, adverse impacts to streams and riparian zones as the proposed mining activities would not disturb these areas within the permit boundary. Under the Proposed Action, potential indirect impacts to wetlands within the permit boundary would be minor and long-term.

3.9.2.2 No Action Alternative

Under the No Action alternative, there would be no direct, adverse impacts associated with the mining of that coal. Under the No Action Alternative, there would continue to be surface disturbance as reclamation actions are completed in accordance with the approved reclamation plan. As part of reclamation, certain wetlands and all sediment ponds would be eliminated from within the permit boundary. Potential impacts would be minor and long-term. Indirect impacts to wetlands and riparian zones from the No Action Alternative are not anticipated.

3.10 Fish and Wildlife Resources

3.10.1 Affected Environment

The terrestrial wildlife analysis area for big game, small game, and nongame species, including raptors and other migratory birds, indicates that suitable habitat exists within the mine footprint. The analysis area for assessing potential impacts to fish in this EA is the Lake Sawyer watershed (King County 2015b). The mine footprint is located in three sub-watersheds of the Lake Sawyer and Green River watersheds: Ginder Lake, Mud Lake, and Lake No. 12. Ginder Lake and Mud Lake both drain to the west via correspondingly named creeks, eventually flowing to Rock Creek and then into Lake Sawyer. Lake No. 12 is situated just east of the permit area and discharges to the east through a wetland area, eventually flowing to the Green River. The Lake Sawyer watershed does not include Lake No. 12; mining activities that would occur under the Proposed Action would not be located in the area of the mine that is adjacent to and within the Lake No. 12 watershed. The wildlife habitat located within the mine footprint is predominately composed of the mixed deciduous/needle leaf and mixed deciduous communities. Other habitat types include Douglas shrubland/grassland and wetland communities.

The three SEPA EIS's (Parametrix 2009a, Parametrix 2009b, Black Diamond 2009c) for projects adjacent to and near John Henry No. 1 Mine all contained wildlife studies including field observations of wildlife. For a historical perspective, Table 23 provides a listing of fauna observed in 1981by WDG consultants (WDG 1981) and by consultants for the Morgan Kame sand and gravel mine expansion EIS (Raekeke 2009, ELS 2008).

Historical field observations were also augmented with information about species habitat preferences, in order to determine the potential occurrence of additional wildlife species. Previous Wetland Resources, Inc. (WRI) wildlife studies conducted on similar properties were reviewed (WRI 2006, 2007, 2008). Also, data regarding habitat-species relationships was obtained from Maser (1998) and Johnson et al. (1997) for mammals, Peterson (1990) for birds, and Stebbins (1966) for reptiles and amphibians.

Table 23. Observed Wildlife at the John Henry No.1 Mine and Morgan Kame Terrace Sand and Gravel Mine

Common Name	Scientific Name	Observed		
		WDG	Morgan Kame	
			Raedeke	ELS
AMPHIBIANS				
Pacific Tree Frog	Pseudacris regilla		Y	N
REPTILES				
Northwestern Garder Snake	Thamnophis ordinoides		Y	N
BIRDS				
*American White Pelican	Pelicanus erythrorhynchos	N	N	N
*Great Blue Heron	Ardea herodias	N	N	Y
*Canada Goose	Branta canadensis	N	Y	Y
*Mallard	Anas playrhynchos	N	Y	Y
Ring-necked Duck	Aythya collaris	N	Y	N
Hooded Merganser	Lophodytes cucullatus	N	Y	N
Bald Eagle	Halianeetus leucocephalus	N	Y	Y
Red-tailed Hawk	Bueo jamaicensis	Y	Y	Y
Golden Eagle	Aquila chrysaetos	N	N	Y
Band-tailed Pigeon	Columba fasciata	N	Y	N
Mourning Dove	Zenaida macroura	N	Y	N
Vaux's Swift	Chaetura vauxi	N	Y	N
*Rufous Hummingbird	Selasphorus rufus	Y	Y	N
Belted Kingfisher	Ceryle alcyon	Y	N	Y
Red-breasted Sapsucker	Sphyrapicus ruber	N	Y	N
Downy Woodpecker	Picoides pubescens	Y	N	Y
Hairy Woodpecker	Picoides villosus	Y	Y	N
Northern Flicker	Colaptes auratus	N	Y	Y
Pileated Woodpecker	Dryocopus pileatus	Y	Y	Y
*Olive-sided Flycatcher	Contopus cooperi	N	Y	N
*Western Wood-Pewee	Contopus sordidulus	N	Y	N
Pacific Slope Flycatcher	Empidonax difficilis	N	Y	N
Tree Swallow	Tachycineta bicolor	N	Y	N
Violet-green Swallow	Tachycineta thalassina	N	Y	N
Northern Rough-winged Swallow	Stelgidopteryx serripennis	N	Y	N
Stellar's Jay	Cyanocitta stelleri	Y	Y	Y
Western Scrub-jay	Aphelocoma californica	N	N	Y
American Crow	Corvus brachyrhynchos	N	Y	Y
Common Raven	Corvus corax	N	Y	N
Black-capped Chickadee	Poecile atricapillus	Y	Y	Y
Chestnut-backed Chickadee	Poecile rufescens	Y	Y	N
Bushtit	Psaltriparus minimus	N	N	Y
Red-breasted Nuthatch	Sitta canadensis	N	Y	N
Brown Creeper	Certhia americana	N	Y	N

Common Name	Scientific Name	Observed		
Bewick's Wren	Thryomanes bewickii	Y	Y	N
Winter Wren	Troglodytes troglodytes	Y	Y	Y
Marsh Wren	Cistothorus palustris	Y	Y	N
Golden-crowned Kinglet	Regulus satrapa	Y	Y	N
Ruby-crowned Kinglet	Regulus calendula	Y	N	Y
American Robin	Turdus migratorius	Y	Y	Y
Varied Thrush	Ixoreus naevius	N	N	Y
European Starling	Sturnus vulgaris	N	N	Y
Hutton's Vireo	Vireo huttoni	N	Y	N
Orange-crowned Warbler	Vermivora celata	N	Y	N
*Yellow-rumped Warbler	Denroica coronata	N	Y	N
Black-throated Gray Warbler	Denroica nigrescents	N	Y	N
Common Yellowthroat	Geothlypis trichas	Y	Y	N
*Wilson's Warbler	Wilsonia pusilla	N	Y	Y
*Western Tanager	Piranga ludoviciana	N	Y	N
*Black-headed Grosbeak	Pheucticus melanocephalus	N	Y	N
Evening Grosbeak	Coccothraustes vespertinus	Y	Y	N
Spotted Towhee	Pipilo maculatus	N	Y	Y
Song Sparrow	Melspiza melodia	Y	Y	Y
White-crowned Sparrow	Zonotrichia leucophrys	Y	Y	Y
Dark-eyed Junco	Junco hyemalsi	Y	Y	Y
Red-winged Blackbird	Agelaius phoeniceus	Y	Y	Y
Brown-headed Cowbird	Molothrus ater	N	Y	N
Pubple Finch	Carpodacus purpureus	N	Y	N
House Finch	Carpodacus mexicanus	N	N	Y
Red Crossbill	Loxia curvirostra	N	Y	N
Pine Siskin	Carduelis pinus	Y	Y	N
American Goldfinch	Carduelis tristis	N	Y	N
*Swainson's Thrush	Catharus ustulatus	Y	N	N
*Townsend's Warbler	Setophaga townsendi	Y	N	N
Common (Northern) Flicker	Colaptes auratus	Y	Y	Y
Rufous-sided Towhee	Pipilo erythrophthalmus	Y	N	N
Cooper's Hawk	Accipiter cooperii	N	N	N
Common Snipe	Gallinago gallinago	N	N	N
Sharp-shinned Hawk	Accipiter striatus	N	N	N
Willow Flycatcher	Empidonax traillii	Y	N	N
Barn Swallow	Hirundo rustica	Y	N	N
Long-billed Marsh Wren	Cistothorus palustris	Y	Y	N
MAMMALS				
Eastern Cottontail	Sylvilagus floridamus	N	N	Y
Douglas Squirrel	Tamiasciurus douglasii	N	Y	N
Black Bear	Ursus americanus	Y	N	N
Raccoon	Procyon lotor	N	Y	Y
Coyote	Canis latrans	N	Y	Y
Elk	Cervus elaphus	N	Y	Y
Columbia Black-Tailed Deer	Odocoiluus hemionus	Y	Y	Y
Muskrat	Ondatra zibethicus	Y	N	N
Townsend's chipmunk	*Tamias townsendii*	Y	N	N
Shrew-mole	Neurotrichus gibbsii	Y	N	N
Mink	Neovison vison	Y	N	N

* Migratory Birds

Habitat within the mine footprint supports many types of nongame species (e.g., small mammals, raptors, passerines, and reptiles). Nongame species serve as predators, prey, and scavengers in ecosystems. The big game species whose overall range overlap with the mine

footprint include black-tail deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), black bear (*Ursus americanus*), and mountain lion (*Puma concolor*). Small game species that occur within the region include furbearers, upland game birds, and waterfowl. Potential habitat for small game species (except waterfowl) within the mine footprint includes all of the plant communities that occur there. Potential habitat for waterfowl within and near the mine footprint is limited to small lakes, wetlands, and sediment ponds.

3.10.1.1 Fish Species and Essential Fish Habitat

In 1983, a supplemental baseline study of fish and their habitat was prepared under the direction of Michael Shepard, a University of Washington Staff Biologist. It was referenced by OSMRE in the FEIS (OSMRE 1985). It is included as Appendix IX-2 of the PAP (PCCC 2011a). This study concluded that because of natural sandstone ledge barriers, Mud Lake Creek provided little habitat for spawning and rearing of salmonids. Ginder Creek, on the other hand, generally represents good fish habitat provided that a downstream barrier is removed. The removal of the barrier is not proposed as part of the Proposed or No Action Alternatives and is not within PCCC's control. The Washington Department of Fish and Wildlife (WDFW) SalmonScape (2015d) website does not show Ginder Creek or Mud Lake Creek as salmon or trout habitat.

Coho salmon, steelhead, cutthroat trout, and other resident trout species are known to occur above the outlet of Lake Sawyer (Covington Creek). Coho salmon and cutthroat trout have been reported upstream as far as Jones Lake in Rock Creek. Steelhead travel past Lake Sawyer into Rock Creek but have not been reported as far upstream as Jones Lake. Coho and cutthroat trout have also been reported in Ravensdale Creek (Raekeke 2009). Resident cutthroat trout and Coho salmon are the dominant native fish species found in streams and lakes in the Lake Sawyer watershed, including Black Diamond Lake/Black Diamond Lake Creek, and Rock Creek. Coho salmon are not a Federal or State listed species. A winter run of Coho salmon move into Lake Sawyer in December with most fish spawning in Ravensdale Creek (City of Black Diamond 2009a). Rock Creek is considered essential fish habitat for Coho salmon. Essential fish habitat includes streams and other water bodies currently or historically accessible to salmon except areas upstream of long standing, naturally and manmade impassable barriers (Cedarock 2009). Cutthroat trout is not Federal or State listed as populations are stable. They are present in Lake Sawyer and tributaries including Rock Creek. Some cutthroats are living exclusively in fresh water. Some are anadromous (Cedarock 2009). OSMRE queried the NMFS Northwest Regional Office's current listing data on the West Coast salmon and steelhead species that may be impacted by the project revision proposal in King County, Washington. The following species were either listed or considered a species of concern dependent on the water system (river, lake, fen, sound, or coast): sockeye salmon (*Oncorhynchus nerka*), Chinook salmon (*Oncorhynchus tshawytscha*), Coho salmon (*Oncorhynchus kisutch*), and Puget Sound steelhead (*Oncorhynchus mykiss*). Special status aquatic species are discussed in Section *3.10.1.25*, *Special Status Species*.

3.10.1.2 Special Status Species

Special status species are those species for which state or Federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally

listed species that are protected under the Endangered Species Act (ESA) and species that WDFW has designated as threatened, endangered, or species of concern in Washington State. The analysis area for state listed sensitive species is the mine footprint within suitable, historic, or occupied habitat and is coincident with the analysis area described in Section 3.7, *Vegetation*. The analysis area for federally listed fish species includes approximately 2 miles of buffer surrounding the John Henry No. 1 Mine. The buffer includes portions of the Green River watershed and Sawyer Lake.

As noted above, WRI conducted vegetative field surveys in 2005 and 2007 for the adjacent property with similar vegetative habitat (Parametrix 2009a). No federally listed or State listed endangered, threatened, or sensitive plants species were found during the WRI field surveys. A USFWS Information for Planning and Conservation (IPaC) species list was obtained in January 2017 that confirmed that no endangered, threatened, or proposed plant species had the potential to occur within the vicinity of the mine footprint (USFWS 2016). A search of Natural Heritage Features, which includes rare plants, high quality wetland ecosystems, and high quality terrestrial ecosystems, in the State of Washington by township, range and section was conducted in June 2016 and found no features in the sections in which the mine footprint is located (WDNR 2015a).

The WDFW website was also referenced by OSMRE (WDFW 2016) to confirm WRI's findings regarding documented information on the presence of Priority Habitats and Species (PHS). Thus, the WDFW PHS maps do not indicate any records of endangered, threatened, or sensitive amphibian, reptile, bird, or mammal species on the John Henry No. 1 Mine (WDFW 2016).

3.10.1.3 Federally Threatened, Endangered, and Candidate Species

Using the USFWS IPaC website, a species list was produced showing the federally listed species that have the potential to occur within or near the mine footprint. In January 2017, the United States Fish and Wildlife Service (USFWS) updated the list of Federal endangered, threatened, candidate, or sensitive species for the project site in King County, Washington. There are currently five federally listed species that could potentially be present at the John Henry No. 1 Mine including: Marbled-murrelet, Streaked horned lark, Yellow-billed cuckoo, Bull Trout, and the North American wolverine. Critical habitat has been designated for bull trout and Chinook salmon in the Green River which is approximately 1.2 miles from the mine footprint at the closest point. However, there are no critical habitats within the permit boundary area. No impacts are expected to habitats along the Rock Creek, Green River, or other priority habitats outside the permit boundary, or to listed species potentially present, from the Proposed or Alternative actions. Based on the lack of critical habitat in the project area, determinations of "no effect" were made for each of the five species. OSMRE has made the determinations of "may affect, not likely to adversely affect" for Puget Sound (PS) Chinook salmon (*Oncorhynchus tshawytscha*), and designated critical habitat. Letters of consultation with the National Marine Fisheries Service (NMFS) and USFWS are provided in Appendix C, *Consultation*.

3.10.1.3.1 Marbled murrelet (Brachyramphus marmoratus) – Endangered with Critical Habitat

The marbled murrelet is a Federal endangered species and State threatened species, having the unique behavior of foraging in marine waters and flying inland to nest in large conifer trees. Nesting behavior has been detected as far as 55 mi (88 km) from the ocean in Washington. Murrelets nest mostly on large branches or other suitable platforms in large trees, with a preference for mature and old forest in Washington, Oregon, and California. Marbled murrelets prey primarily on near-shore forage fish (WDFW 2013).

3.10.1.3.2 Streaked Horned lark (Eremophila alpestirs strigata) – Threatened with Critical Habitat

The streaked horned lark, a Federal threatened species, and state endangered species, is a rare endemic subspecies found only in western Washington and Oregon. It is perhaps the most distinct subspecies of the horned lark, a small common ground-dwelling passerine that prefers open grassland habitat.

3.10.1.3.3 Yellow-Billed Cuckoo (Coccyzus americanus) – Threatened with Proposed Critical Habitat

The yellow-billed cuckoo, a Federal threatened species and State candidate species, prefer open lowland deciduous woodlands with clearings and shrubby vegetation, especially those near rivers and streams. In western North America, there is a strong preference for large continuous riparian zones with cottonwoods and willows. The yellow-billed cuckoo nests in large, contiguous, blocks of riparian habitat (greater than 50 acres), particularly woodlands with cottonwoods (*Populus fremontii*) and willows (*Salix* sp.). A dense multi-layered canopy of understory foliage appears to be an important factor in nest site selection. The multilayered canopy provides shade and traps moisture to create the relatively cooler and more humid streamside conditions that are believed to be important for nesting success. At the landscape level, the amount of cottonwood-willow-dominated vegetation in the landscape and the width of riparian habitat appear to influence yellow-billed cuckoo distribution and abundance (USFWS 2014b). Cuckoos appear to avoid nesting in isolated patches of about 1 to 2 acres in size or in narrow, linear riparian habitats that are less than 33 to 66 ft (10 to 20 m) wide (Halterman et al. 2015). Overall, migration and wintering habitats appear to be less restrictive to this species (USFWS 2014). Single birds have been detected in isolated habitat patches or linear riparian corridors during migration or the early breeding season (mid to late June). Migrating yellow-billed cuckoos also have been found in coastal scrub, second-growth forests, and woodlands, hedgerows, forest edges, and in smaller riparian patches than those used for breeding (USFWS 2014). Diet consists mainly of large insects such as caterpillars, grasshoppers, katydids, beetles, and crickets; small frogs and lizards, bird eggs, and nestling birds are also occasionally eaten.

3.10.1.3.4 Bull Trout (Salvelimus confluentus) – Threatened with Critical Habitat

The bull trout is a Federal threatened species and State candidate species. Bull trout have never been observed in the Lake Sawyer system according to Ted Muller of the WDFW. Also according to Mr. Muller there have been no documented sightings of bull trout in the lower and middle portions of the Green River system into which drainage from the mine eventually flows (Muller 2000). Bull trout require cold clean water and normally reside at much higher elevations according to Mr. Muller. He stated he has personally electroshock-surveyed the Green River system up to Howard Hanson dam and has not observed any Bull or Dolly Varden trout. The

Howard Hanson dam is in the upper portion of the Green River and is located about 15 miles east of the mine site. Bull trout require cold water to survive, so they're seldom found in waters where temperatures exceed 59 to 64 degrees (F). They also require stable stream channels, clean spawning and rearing gravel, complex and diverse cover, and unblocked migratory corridors (USFWS 2015e). These char require very cold, clean water in relatively pristine streams for the spawning and rearing phases of their life cycle, thus limiting the distribution of this species largely to higher elevations (King County Department of Natural Resources 2002).

3.10.1.3.5 Chinook Salmon (Oncorhynchus tshawytscha)

Chinook salmon is a Federal threatened species and State candidate species. The Green River Chinook run is a late summer run and is a component of the Puget Sound Chinook run. The run usually commences in late August and is finished by October. The run on Big Soos Creek is comprised of both hatchery and wild stocks. When the hatchery quota is filled, fish are allowed to bypass the hatchery and spawn upstream (WDFW and WWTIT 1994, Ruggerone and Weitkamp 2004). Some Chinook will spawn in the lower reaches of Covington Creek although it is physically impossible for the Chinook to reach Lake Sawyer because upper Covington Creek is either dry or contains extremely low flows in the August through October spawning period.

3.10.1.4 Migratory Birds

Migratory birds are protected by the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). The following species of migratory birds could potentially be affected by activities in within the mine footprint (USFWS 2016).

- Bald Eagle (*Haliaeetus Leucocephalus*): Year-round
- Black Swift (*Cypeseloides niger*): Breeding Season
- Brewer's Sparrow (*Spizella breweri*): Breeding Season
- Calliope Hummingbird (*Stellula calliope*): Breeding Season
- Caspian Tern (*Hydroprogne caspia*): Breeding Season
- Cassin's Finch (*Carpodacus cassinii*): Year-round
- Fox Sparrow (*Passerella iliaca*): Year-round
- Olive-sided Flycatcher (*Contopus cooperi*): Breeding Season
- Peregrine Falcon (*Falco peregrinus*): Breeding Season
- Purple Finch (*Carpodacus purpureus*): Year-round
- Rufous Hummingbird (*Selasphorus rufus*): Breeding Season
- Short-eared Owl (*Asio flammeus*): Year-round
- Western Grebe (*aechmophorus occidentalis*): Wintering
- Willow Flycatcher (*Empidonax traillii*): Breeding Season

3.10.1.4.1 Migratory Birds

The MBTA provides federal legal protection from anthropogenic depredation for more than a 1,000 avian species (16 USC 7.3-712). In addition to the MBTA, bald and golden eagles are protected under the BGEPA (16 USC 668 et seq). OSMRE and USFWS have a Memorandum of Understanding since December 7, 2016 to enhance collaboration between the agencies and strengthen migratory bird conservation. The majority of birds found within the mine footprint and vicinity are considered migratory under the MBTA. These birds are primarily summer residents in the region. Many of the summer residents are neotropical migrants that winter in Central and

South America. Many bird species are more vulnerable to disturbance during the breeding season when anthropogenic disturbances can compromise successful reproduction. The timing and duration of the breeding season is species-specific and may vary according to latitude, elevation, and climatic conditions. Table 23 provides a list of observed wildlife at the John Henry No. 1 Mine and surrounding areas (i.e. Morgan Kame Terrace and Gravel Mine). Species marked with an asterisk are migratory bird species known to occur or with potential to occur within the mine footprint and surrounding region.

3.10.1.4.2 Raptors

Raptors are protected under state and Federal laws including the MBTA and bald and golden eagle are protected under the BGEPA. A variety of raptor habitats are found within and adjacent to the mine footprint, from lower elevation grassland and shrublands to montane shrublands and forests, *see* Figure 12. As a result, there are a variety of raptor species likely to hunt or breed in the area including: red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aguila chrysaetos*), bald eagle (*Haliaeetus leucocephalus*), sharp-shinned hawk (*Accipter striatus*), and Cooper's hawk *(Accipiter cooperii*) [Table 23] (Parametrix 2009a).

3.10.1.5 Priority Habitat and Species (PHS)

The WDFW defines priority habitat as "a habitat type with unique or significant value to many species" and priority species as "fish and wildlife species requiring protective measures and/or management guidelines to ensure their perpetuation." Maps showing locations for current WDFW records of priority habitats and species for the mine footprint were obtained from the WDFW (2016).

3.10.1.6 Onsite Priority Habitat and Species

Priority Habitat and Species (PHS) maps and information for the region have been consulted on many occasions in the past for the project and information from the 2000 query are contained in the PAP at Appendix IX-3 (PCCC 2011a). Up to date information and data are available on line from WDFW (2016). WDFW maps show locations for current WDFW records of priority habitats and species (WDFW 2016). PHS maps illustrate the location of priority habitats and species on the mine site and in surrounding areas. WDFW PHS maps from 2016 do not indicate that any endangered, threatened, or sensitive amphibian, reptile, bird, or mammal species occur in the John Henry No. 1 Mine or in surrounding areas. Priority habitats occurring onsite are described below. Through permit regulations and best management practices, mining and reclamation at the John Henry No. 1 Mine will have no direct impact to these habitats.

3.10.1.6.1 Caves Or Cave-rich Areas

Because the mine footprint is located in an area that was historically mined underground, the area is listed as priority habitat for bats. However, there are no underground mine openings on or near the mine footprint so roosts are unlikely although these bats may forage aerially over the permit area.

3.10.1.6.2 Elk (Cervus elaphus): Region, Green River

While not a threatened or endangered species (TES), the Rocky Mountain elk is a State designated game species. These include native and non-native wildlife species of recreational

importance, commercial importance, or recognized species used for tribal ceremonial and subsistence purposes and that are vulnerable to habitat loss or degradation. While there are several game species that may inhabit the John Henry No. 1 Mine for all or part of their life cycle, WDFW has designated the entire mine site as priority habitat for the Rocky Mountain elk (WDFW 2015a). The mine footprint is within the historic distribution of Roosevelt elk (*Cervus elaphus roosevelti*) but by the turn of the last century they had been eliminated by early settlers (Bradley 1982, Spencer 2002). Rocky Mountain elk were introduced into western Washington from Yellowstone National Park in the early part of the 20th century and by the late 1980's and early 1990's these elk spread to the mine vicinity (Spencer 2002). It is noteworthy that this species was not observed in the WDG wildlife survey in 1981 (WDG 1981).

3.10.1.6.3 Lakes

Since mining began in 1986, beavers established a colony in Mud Lake. This caused adverse impacts to PCCC's drainage control system and requires periodic trapping and relocation of beaver by licensed trappers. Priority habitats identified within the mine footprint include Ginder Lake (and Wetland C) and Mud Lake wetlands described in the Section 3.7, *Vegetation*. These have been designated priority aquatic and Elk habitat since mining began in 1986 and remained so in 2016.

3.10.1.6.4 Wetlands, Freshwater Emergent, and Freshwater/Shrub

Sediment Control Pond B, with its wetland characteristics, has been added as priority habitat but was not included in 2000. Sediment Control Pond B, now designated as a priority habitat, is scheduled to be filled, graded, and planted with Douglas fir in accordance with the approved final reclamation plan (PCCC 2011a). Mapping shows some non-existent wetlands within the footprint of Pit 1 and the Pit 1 backfill area indicating that the mapping may be dated. The riparian border between Mud Lake and the Green River Gorge Road is new priority habitat that will not be disturbed by mining or reclamation.

3.10.1.7 Off-site Priority Habitats and Species (PHS)

Off-site priority habitats are to the east of the site in and around Lake 12 and the Lake 12 wetlands. Mining and reclamation would not disturb the Lake 12 drainage basin. Upstream from the Ginder Lake wetland system, priority habitat extends to the north. Additional priority habitats are identified along Ginder Creek after it leaves the permit area to the west. Mining and reclamation activities would have no impact on these priority habitats. Ginder Creek flows into Rock Creek which also contains a number of identified priority habitats. Lake Sawyer is a designated breeding, nesting, and management buffer area for the bald eagle. The Green River Watershed and region is priority habitat for a number of species including Chinook, chum, and Coho salmon, bull trout, harlequin duck, sockeye, steelhead, and elk. The Rock Creek and Covington Creek watersheds are priority habitats for the western floater (*Anodonta kennerlyi*), steelhead, and coastal cutthroat (*Oncohryncus clarki*) (occurrence and breeding). The Cedar River wetlands are priority habitat for the western pond turtle. Other priority habitats include terrestrial land, riverine wetlands, and snag-rich areas within the Green River vicinity. Through permit regulations and best management practices, mining, and reclamation at the John Henry No. 1 Mine will have no direct impact to these habitats.

3.10.2 Environmental Consequences

Approximately 29.7 acres of vegetation would be removed and 2.58 acres of non-jurisdictional wetlands would be eliminated as a result of continued mining under the Proposed Action Alternative. All vegetation removal would consist of mature deciduous forest and would occur within the permit boundary for the John Henry No. 1 Mine site. The wetlands that would be removed are classified as palustrine emergent, forested, scrub, and unconsolidated bottom. Removal of vegetation and wetlands would result in loss of habitat. During reclamation, the disturbed areas would be backfilled and graded to AOC, and replanted as described in the approved reclamation plan.

3.10.2.1 Proposed Action Alternative

Under the Proposed Action Alternative, vegetation would be removed and wetlands would be eliminated by mining and reclamation activities. Long- and short-term impacts to mammals would occur due to the loss of habitat as a result of the removal of mature deciduous forest and palustrine wetlands from the continued mining of coal at the John Henry No. 1 Mine. Potential impacts would also occur as the result of mammal fatality during proposed mining activities. Potential impacts would be long- and short-term and minor and would be limited to areas disturbed by proposed mining and reclamation with no changes in the plant community structure or composition elsewhere within the permit boundary.

Based on the lack of critical habitat in the project area, determinations of "no effect" were made for the five federally listed species that could potentially be present at the John Henry No. 1 Mine including: Marbled-murrelet, Streaked horned lark, Yellow-billed cuckoo, Bull Trout, and the North American wolverine.. OSMRE has made the determinations of "may affect, not likely to adversely affect" for Puget Sound (PS) Chinook salmon (Oncorhynchus tshawytscha), and designated critical habitat. Letters of consultation with the National Marine Fisheries Service (NMFS) and USFWS are provided in Appendix C, Consultation. The project site is outside the range of the Streaked Horned lark and therefore would have no effect on the species. Because of the lack of suitable nesting habitat, there is no anticipated use by murrelets; and therefore, no anticipated exposure to effects. The project is not located in suitable habitat and therefore it is not anticipated to contain yellow billed cuckoos and would therefore have no effect on cuckoos. These char require very cold, clean water in relatively pristine streams for the spawning and rearing phases of their life cycle, thus limiting the distribution of this species largely to higher elevations (King County Department of Natural Resources 2002). Some Chinook will spawn in the lower reaches of Covington Creek although it is physically impossible for the Chinook to reach Lake Sawyer because upper Covington Creek is either dry or contains extremely low flows in the August through October spawning period.

The direct impacts of surface coal mining activities on wildlife occur during mining and are therefore short-term and minor. They include road kills by mine-related traffic, restrictions on wildlife movement created by fences, spoil piles and pits, and displacement of wildlife from active mining areas. Displaced animals may find equally suitable habitat that is not occupied by other animals, occupy suitable habitat that is already being used by other individuals, or occupy

poorer quality habitat than that from which they were displaced. The animals may suffer from increased competition with other animals and are less likely to survive and reproduce.

Big game animals are highly mobile and can move to undisturbed areas. There may be more restrictions on big game movement on or through the Mine, however, due to additional fences, spoil piles, and pits related to mining. SMCRA requires that fences, overland conveyors, and other potential barriers be designed to permit passage for large animals [30 CFR § 816.97(e)(3)].

Medium-sized mammals (such as coyotes, foxes, skunks, and raccoons) would be temporarily displaced to other habitats by mining, potentially resulting in increased competition and mortality. However, these animals would quickly rebound on reclaimed areas, as forage developed and small mammal prey species recolonized. Direct losses of small mammals would be higher than for other wildlife, since the mobility of small mammals is limited and many retreat into burrows when disturbed. Therefore, populations of such prey animals as voles, mice, chipmunks, and rabbits would decline during mining. However, these animals have a high reproductive potential and tend to re-invade and adapt to reclaimed areas quickly.

Other upland game bird species (i.e., spruce grouse, wild turkey, pheasant, and gray partridge) that could potentially occur on the Mine could be temporarily displaced to adjacent habitats during mining. These birds are highly mobile and can move to undisturbed areas. Their populations are relatively low; therefore, their relocations should not increase competition and mortality.

Displaced songbirds including those Migratory Bird Species of Management Concern (Section 3.10.1.5, *Migratory Birds*) would have to compete for available adjacent territories and resources when their habitats are disturbed by mining operations. Where adjacent habitat is at carrying capacity, this competition would result in some mortality. Losses would also occur when habitat disturbance coincides with egg incubation and rearing of young. Impacts of habitat loss would be short-term for grassland species, but would last longer for tree- and shrub-dependent species. Concurrent reclamation would minimize these impacts. A diverse seed mixture planted in a mosaic with a shrub-land phase would provide food, cover, and edge effect. Other habitat enhancement practices include the restoration of diverse landforms, direct topsoil replacement, and the construction of brush piles, snags, and rock piles. Therefore, under the Proposed Action Alternative impacts to fish and wildlife species would be minor and short and long-term.

Waterfowl and shorebird habitat on the Mine is minimal, and production of these species is very limited. Mining would thus have a negligible effect on migrating and breeding waterfowl. Sedimentation ponds created during mining would provide interim habitat for these fauna. No delineated wetlands occur on the Mine so no wetlands mitigation would be required. No fisheries habitat would be impacted within the Mine.

Under the Proposed Action Alternative, big game would be displaced from portions of the Mine to adjacent ranges during mining. Mule deer would be most affected as the Mine contain good quality habitat. White-tailed deer would not be affected, as they have not been observed on the Mine. Big game displacement would be incremental, occurring over several years and allowing for gradual changes in distribution patterns. Big game residing in the adjacent areas could be impacted by increased competition with displaced animals. Noise, dust, and associated human presence would cause some localized avoidance of foraging areas adjacent to mining activities. On existing surface mines, however, big game have continued to occupy areas adjacent to and within active mine operations, suggesting that some animals may become habituated to such disturbances (Medcraft and Clark 1986; Phillips et al. 1986). Therefore potential indirect impacts to fish and wildlife species would be long-term and minor.

A hydrologic control plan is designed to prevent adverse impacts to the hydrologic balance outside the permit area, thus maintaining the quantity and quality of surface waters and the existing fish habitat downstream of the disturbance.

3.10.2.2 No Action Alternative

Under the No Action Alternative, PCCC would begin reclamation activities immediately. Reclaimed land would become forest and fish and wildlife habitat. Medium-sized mammals (such as coyotes, foxes, skunks, and raccoons) would quickly rebound on reclaimed areas, as forage developed and small mammal prey species recolonized. These animals have a high reproductive potential and tend to re-invade and adapt to reclaimed areas quickly. Big game and avian species displaced during mining activities to adjacent lands would be expected to return to the area once reclamation activities are complete and vegetation has returned. Therefore potential indirect impacts to fish and wildlife species would be long-term and minor. Similar to the Proposed Action Alternative displacement as a result of reclamation activities under the No Action Alternative would be long-term and minor.

3.11 Land Use

3.11.1 Affected Environment

The pre-mining land use of the permit area was unmanaged forest for the upland area and fish and wildlife habitat for the Mud Lake and Ginder Lake wetlands. Prior logging of the site was predominantly used as a source of timbers in underground mining from the 1880's until the mid-1970's. There was no planned reforestation conducted during this time and re-vegetation occurred naturally. A portion of the permit area was clear-cut in 1982 to allow mining (OSMRE 1985). The land use since 1986 has been mining with the continued associated use of wildlife habitat in undisturbed areas with some forest land reestablished in the reclaimed area of the mine. The permit area consists of entirely private land. The post-mining land use approved by OSMRE in 2001 for the upland area is forestry and fish and wildlife habitat (PCCC 2011a). This is consistent with the landowner's request for a continuation of the pre-mining land use. The

landowners have determined it is compatible with a variety of longer-term uses as illustrated in the PAP in Chapters II and IV specifically Appendices II-3 and IV-8 (PCCC 2011a).

At the time of the 1985 FEIS, the planned Tacoma pipeline was scheduled to be routed through the John Henry No. 1 Mine. However, when the pipeline was constructed in 2002, it was routed around Pit 1 adjacent to the Green River Gorge Road. The construction of the pipeline and related negotiation between Black Diamond and the City of Tacoma provided additional water to Black Diamond and has facilitated development within the City of Black Diamond.

When the 1985 FEIS was issued, a portion of the proposed Mine located within the city limits was already zoned as Mineral Extraction/Forestry. However, 12 acres were zoned residential R-2400 and 36 acres zoned residential RM-9600. This required a rezone to Mineral Extraction/Forestry to allow for the placement of Spoil Piles 3 North and 3 South. PCCC's rezone application was approved March 20, 1986 after hearings before the City of Black Diamond's planning commission and council. The mining extraction/forestry designation is considered an interim zoning classification. The underlying zoning for the land within the city limits has zoning codes [Residential (R4,) Medium Density Residential (MDR8), and Master Planned Development (MPD)] (Black Diamond 2009b).

Washington State passed the GMA in 1991. The primary purpose of the Act was to establish designated Urban Growth Areas in order to prevent urban sprawl and focus growth in areas either that had existing infrastructure or which could more easily develop new infrastructure. Another purpose was to protect critical areas and natural resource lands. Urban Growth Areas established in Washington as a result of the Act included all areas within incorporated cities including Black Diamond.

The City of Black Diamond, including the historic downtown, Morganville and various additional properties, was incorporated in 1959. Currently, John Henry No. 1 Mine permit area extends within the city limits. The City of Black Diamond completed its first Comprehensive Plan in 1980. That plan proposed future annexation of lands to the northwest, east, and southwest to the City of Black Diamond. Subsequent annexations in 1985 and 1994 added lands to the northwest and southwest to the City of Black Diamond including Lake Sawyer. The portion of the John Henry No. 1 Mine located in unincorporated King County was considered for annexation, but was not approved.

The City of Black Diamond completed its first GMA Comprehensive Plan in 1996. That same year, the City of Black Diamond negotiated a "potential annexation area" agreement with King County and nearby property owners that was formalized as the "Black Diamond Urban Growth Area Agreement." Following execution of the Black Diamond Urban Growth Area Agreement, the City of Black Diamond annexed an area around Lake Sawyer and the West Annexation Area to the City of Black Diamond in 1998 and 2005.

In 2005, the City of Black Diamond adopted MPD Ordinances (Ordinance No. 05-779 and Ordinance No. 05-796). These Ordinances establish the MPD zoning district and its standards

and MPD permit requirements for parcels or groups of parcels that are greater than 80 acres in size. In 2009, the City of Black Diamond further updated several of its planning documents and environmental policies and procedures, including its Comprehensive Plan (Black Diamond 2009a), MPD Ordinance (Black Diamond 2005), and Sensitive Areas Ordinance (Black Diamond 2008). In 2010, the City of Black Diamond approved two MPD's; The Villages and Lawson Hill (*see* Section 4.1.7, *Land Use*, for additional information).

The City of Black Diamond's Comprehensive Plan includes a vision for what the City of Black Diamond would become by 2025, and emphasizes:

- Historic heritage and natural setting
- Small-town atmosphere
- Balance of moderate growth and economic viability
- Economic base
- Mix of residential types, sizes and densities, clustered to preserve maximum open space
- Trails/bikeways/greenbelts connecting housing, shopping, employment, and parks and recreation areas
- Active citizen participation in an effective and open government
- Adequate public services and environmental protection

3.11.2 Environmental Consequences

In May 2011, OSMRE solicited comments from the City of Black Diamond as a result of PCCC's permit revision application to resume mining. The City of Black Diamond had no comments regarding land use other than noting that, under the Proposed Action Alternative, PCCC would be required to submit a grading plan application and obtain a grading permit for activities associated with Spoil Piles 3 North and 3 South, as they are located within the city limits.

As explained in Section 1.1, *Background Information*, the land was rezoned to a Quarry/Mining designation by King County prior to mining in 1985. The pre-mining land use was unmanaged forest in the upland area and fish and wildlife habitat in the Mud Lake and Ginder Lake wetlands. The 29.7 additional acres of disturbance under the Proposed Action Alternative would not result in a change of zoning designation or land use designation. During reclamation this newly disturbed area will be backfilled and graded to AOC. There is no historical use of the soil for cropland and in 2015 OSMRE determined that the property contained no Prime Farmland.

3.11.2.1 Proposed Action Alternative

Under the Proposed Action Alternative, PCCC would be required to submit a grading plan application and obtain a grading permit for activities associated with Spoil Piles 3 North and 3 South. Impacts would be minor and short-term. Reclaimed land under both the Proposed Action Alternative and the No Action Alternative would be forest and fish and wildlife habitat. The underlying land use within the permit area cannot change for 5 years after reclamation is completed in accordance with SMCRA requirements. Land use impacts would be restricted to the mine permit area and would not result in any indirect impacts.

3.11.2.2 No Action Alternative

Under the No Action Alternative, PCCC would begin reclamation activities immediately and conform to the City of Black Diamond grading permit for Spoil Piles 3 North and 3 South. Reclaimed land under both the Proposed and No Action Alternative would be forest and fish and wildlife habitat. This underlying land use within the permit area cannot change for 5 years after reclamation is completed in accordance with SMCRA requirements for liability under the bond which is for the duration of mining and reclamation and coincident with the operator's responsibility under revegetation requirements. Land use impacts would be restricted to the mine permit area and would not result in any indirect impacts.

3.12 Socioeconomics and Environmental Justice

3.12.1 Socioeconomics

3.12.1.1 Affected Environment

The affected environment for Socioeconomics and Environmental Justice is comprised of the City of Black Diamond and area surrounding the John Henry No.1 Mine including King County. This affected area was identified because Black Diamond is the only urbanized area in the immediate vicinity of the mine. It is expected that this area will supply the majority of employees at John Henry No.1 Mine.

3.12.1.1.1 Population and Employment

The City of Black Diamond had an estimated population of 4,257 in 2014, representing a six percent growth since 2000. The population is comprised of approximately equal numbers of men and women, a median age of 35.7 years, and an average household size of 2.7 people. King County, which includes the City of Black Diamond and the John Henry No. 1 Mine, had a population of 2,008,997 in 2014, representing a 9.9 percent increase from 2000 (U.S. Census Bureau 2000).

Black Diamond is considered a residential community with little industry and direct employment. Most working-aged residents commute to jobs located in the Kent Valley or the Seattle area. According to the City of Black Diamond unemployment is 3.3 percent (Black Diamond 2015a). At its peak production in 1993, the mine employed 75 people and was an important employer in the greater Black Diamond area.

Under the Proposed Action Alternative, PCCC and/or contractors expect to employ 30 full-time staff during the six year mining period and 20 full-time staff during one year of reclamation. Under the No Action Alternative, 20 full-time staff would be employed during two years of reclamation.

3.12.1.1.2 Utilities

Electrical power at the John Henry No.1 Mine is provided by Puget Sound Energy through a privately-owned high voltage power line. PCCC constructed a septic system in 1991. These and other utilities are described:

- PCCC receives power from Puget Sound Energy. The load is 800 to 1,000 kilovolt-ampere (KVA).
- An underground transmission line was built along the access road to the facilities area. The transmission line is owned by PCCC and provides electricity to the office, shop, and preparation plant.
- Two ground-based step-down transformers were installed under Puget Sound Energy's supervision at PCCC's expense. One 300 KVA transformer provides 480-volt electricity to the preparation plant and the other 75 KVA transformer provides 480-volt electricity to the office and shop facilities.
- The John Henry No. 1 Mine uses a well as a source of potable water.
- PCCC pumps make up water for the plant from Pit 2. PCCC can also supply water from pond G or from Ginder Lake.
- PCCC constructed a sewage system in 1991. The system has an approximate 2,500 lineal foot drain field and a septic tank total capacity of approximately 4,500 gallons.

3.12.1.1.3 Public Services

King County and the City of Black Diamond have sufficient public services including a County and City police force, specialized enforcement teams [hazardous materials, helicopter rescue, marine rescue, and special weapons & tactics squad (SWAT)], regional and local fire and emergency medical services (EMS), and several area hospitals [including two 24-hour emergency care hospitals (St. Elizabeth Hospital and the Valley Medical Center)] (King County 2016).

Housing availability in and around the City of Black Diamond is sufficient to accommodate the estimated workforce of 30 full time employees for a period of six years and one year of reclamation under the Proposed Action Alternative. It is assumed that the majority of the workforce will come from the local City or County and therefore will not require relocation.

3.12.1.1.4 Royalty and Tax Revenues

Like all coal mines in the U.S., PCCC paid the Federal Black Lung Excise Tax and into the Abandoned Mine Land fund during previous mining operations and will continue to do so under the Proposed Action Alternative. The coal is a privately-owned reserve and would not be subject to paying royalties. Local tax contributions are expected to be small portion (less than 1 percent) of total King County tax revenues. PCCC would be required to resume abandoned mine land fees upon mining.

3.12.1.1.5 Property Values

Homeowners and landowners in those areas contiguous to the Mine in unincorporated King County expressed concern over a decrease in property values attributable to the proximity of the proposed mine development. Local realtors were contacted to determine if this was the case. One realtor noted that a monthly analysis of home sales and listings in the Black Diamond zip code area since January 2011 shows that, while there is monthly variability, the trend has been from a buyer's to seller's market with fewer homes on the market selling at higher prices. In 2011, it was considered to be a buyer's market with home prices ranging from $113 per

square foot to a maximum of $184 per square foot. Over the ensuing 17 months, prices per square foot trended up and were over $200 per sq. ft. on two occasions (Johnston 2014).

Another realtor provided a background on values of property located adjacent to the mine (Beck 2014). In 1985, the mine opened and employment expanded rapidly. A few years later, several residential developments were proposed and constructed in Black Diamond. The largest development was the 129-lot Morgan Creek developed across the Black Diamond-Ravensdale Road from the entrance to the mine. Another 72-lot development, Lawson Hills Estates was built south of and directly adjacent to the John Henry No.1 Mine in 1992. The 30-lot Diamond Glen development was built in 1990 a half mile west of the mine site. The 10-lot Sunny Lane was built in 1993, one mile west of the mine site. One 5-acre rural residential development was platted in 1977 and completed in the early 1980's. This development, known as Diamond Acres, is surrounded by the John Henry No. 1 Mine on three sides. Eleven lots were developed, but the first home was not built until 1982, with the next seven homes built from 1985 to 1998. This period also coincided with the most active period of surface coal mining at the John Henry No. 1 Mine. The realtor provided data that shows property values in these developments have increased consistent with other regional property value changes.

3.12.1.2 Environmental Consequences

Under the Proposed Action Alternative, the Mine would employ 30 full time people during mining operations and 20 full time people during reclamation. Under the No Action Alternative, the mine would employ 20 full time people during reclamation.

As reported by knowledgeable real estate professionals in the area, property values of nearby properties have not been adversely impacted since the formal announcement of the mine reopening in May 2011. Overall, the operation of the John Henry No. 1 Mine would have little *direct or indirect* impact on the City of Black Diamond and its residents and very little socioeconomic impact in general.

3.12.1.2.1 Proposed Action Alternative

Under the Proposed Action Alternative, PCCC and its contractors would employ an average of about 30 people per day for six years during mining and 20 people per day during the one year of reclamation. The average workweek is expected to consist of 5 working days. The mine would be self-contained and would require no external utility services other than those discussed previously. Between the low levels of unemployment in the community, the likely impact to socioeconomics would be negligible, short-term and would be limited to the local area in and around Black Diamond. Impacts to public services would be negligible because these services are adequate for the estimated workforce of 30 full time employees during mining operations and 20 full time employees during reclamation. It is not anticipated that the estimated workforce would put a strain on any of these public services as they are likely to already be residents of the area.

Indirect employment and increased revenue at local retailers and restaurants could result from the Mine employees spending their salaries in and around the City of Black Diamond. Parts and

other various materials for the mine would most likely be purchased in nearby communities outside of the City of Black Diamond due to its limited amount of commercial activity causing indirect socioeconomic impacts in communities such as Maple Valley or Enumclaw. Since all employees are only expected to work for the Mine for a maximum of seven years (mining and reclamation), any indirect impacts would be negligible and short-term.

3.12.1.2.2 No Action Alternative

Under the No Action Alternative, PCCC and its contractors would employ an average of 20 people for two years for reclamation-only operations. No additional outside services would be required under this alternative than what currently exists. The socioeconomic impacts would be negligible, short-term, and limited to the local area in and around Black Diamond.

Indirect employment at local retailers and restaurants could result from the 20 reclamation employees spending their salaries in and around the City of Black Diamond. Since, employees are expected to come from the local area in and around the City of Black Diamond any indirect impacts would be local. However, due to the small scale of full time employment these impacts are expected to be negligible and short-term.

3.12.2 Environmental Justice

3.12.2.1 Affected Environment

Executive Order 12898 requires Federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations.

According to CEQ and U.S. EPA guidance established to assist Federal agencies, a minority population is present in a project area if:

- The minority population of the affected area exceeds 50%; or
- The percentage of minority population in the affected area is meaningfully greater than its population percentage in the general population.

According to 2010 Census data (U.S. Census Bureau 2010), there are few minority or low-income populations documented in the general vicinity of the mine in the City of Black Diamond compared to the population in the King County area (*see* Table 24).

Table 24. King County and City of Black Diamond Minority and Low-Income Populations

Income and Demographics	King County	City of Black Diamond
Income in the past 12 months below poverty level[1]	35,930	34
Income in the past 12 months at or above poverty level[1]	443,034	1,161
Male Population	1,002,198	1,999
Female Population	1,006,799	2,258
White	1,384,506	3,692

Income and Demographics	King County	City of Black Diamond
Black or African American	123,852	0
American Indian and Alaska Native	15,724	131
Asian	306,079	94
Native Hawaiian and Other Pacific Islander	15,323	0
Some Other Race	51,985	258
Two or More Races	111,528	82
Hispanic or Latino (any race)	184,318	279

[1] households and individuals
Source: US Census Bureau 2010

3.12.2.2 Environmental Consequences

There would be no disproportionately high and adverse (direct or indirect) human health or environmental effects on minority and low-income populations from the Proposed or No Action Alternative. Impacts to human health and environmental resources are described in Sections 3.1 – 3.17 of this EA.

3.13 Transportation

3.13.1 Affected Environment

OSMRE determined that primary transportation impacts would be related to:

- The capability of the Black-Diamond – Ravensdale Road to carry the large coal trucks.
- The capability of the existing traffic control and management system to handle additional truck and car traffic at affected intersections.

The 2035 Washington State Long Range Transportation Plan does not outline any major upgrades or projects for roadways utilized by the Proposed Action (Washington Department of Transportation and Washington State Transportation Commission 2015). King County, through a condition of PCCC's grading permit, put the burden of funding unusual road deterioration on PCCC. PCCC would apply for a grading permit two years prior to the end of mining operations and before reclamation activities.

The three roads impacted by truck traffic into and from the mine include (Parametrix 2009c), *see* Figure 14:

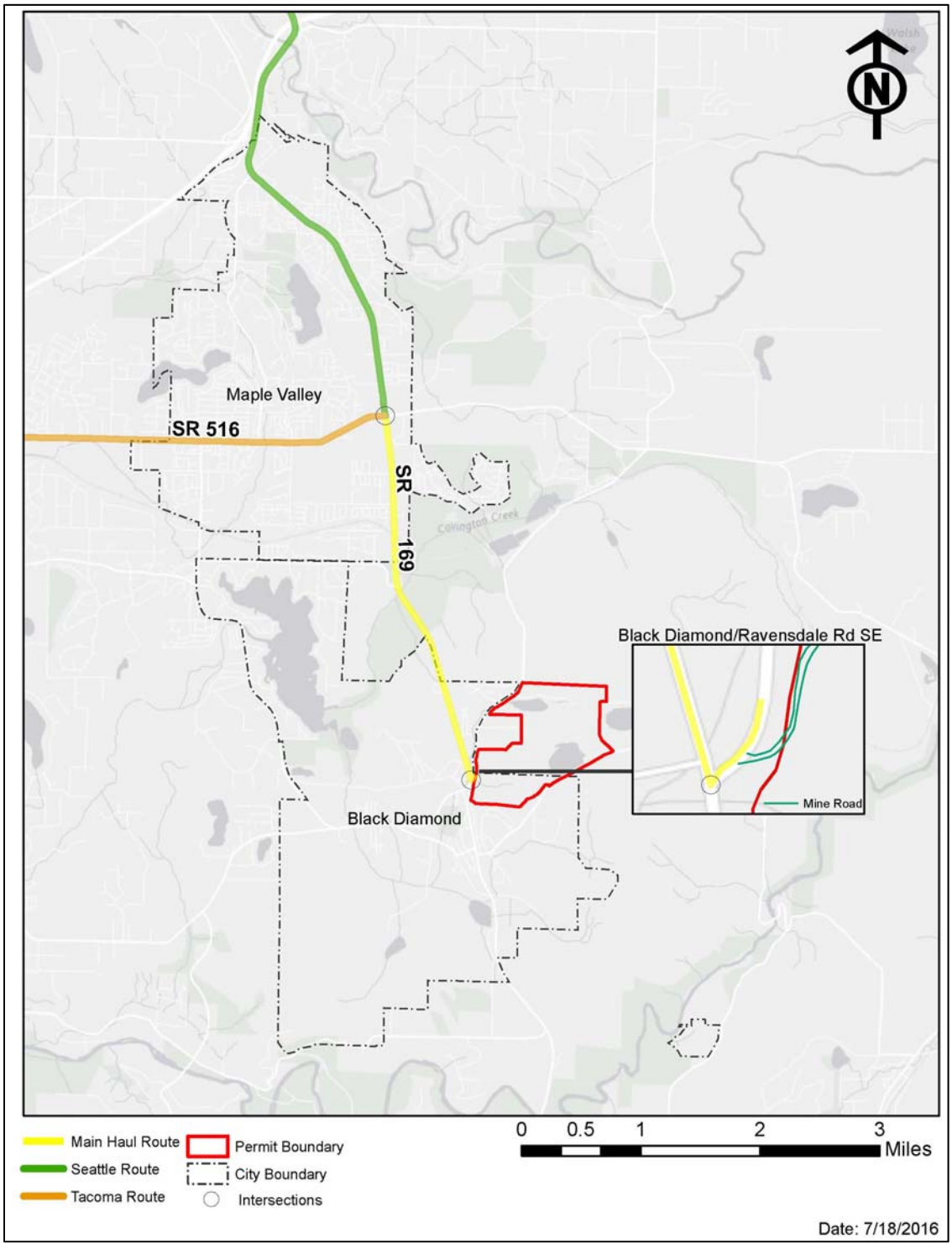
> **SR 169/Maple Valley Black Diamond Road SE** – This roadway is classified as a principal arterial that provides north-south travel. The number of lanes varies from two to four, and the posted speed limit varies from 25 mph to 50 mph. SR 169 is classified by WSDOT as an Urban-Principal Arterial (U1) and is a Highway of Statewide Significance (HSS) which includes interstate highways (I) and other principal arterials that are needed to connect major communities in the State of Washington. SR 169 is the only regional

north-south roadway that connects areas with high levels of employment and services. As a result, a majority of commuters utilize SR 169 during some point of their trip.

SR 516 – This roadway is classified as a principal arterial west of SR 169 and as a minor arterial from SR 169 to Retreat Kanasket Road SE. The number of lanes varies from two to five, and the posted speed limit varies from 30 mph to 45 mph. SR 516 is classified by WSDOT as an Urban-Minor Arterial (U2) and is not a HSS route.

Black Diamond/Ravensdale Road – This roadway is classified as a major collector that provides north-south travel. One lane is provided for each direction of travel. The posted speed limit of the Black Diamond-Ravensdale Road approaching the intersection of SR 169 is 45 mph.

Figure 13. Potential Roadways Impacted by Truck Traffic



The two intersections through which coal haul trucks must operate include the SR 169/Black Diamond/Ravensdale Road Intersection and the SR 169/SR 516 Intersection (Parametrix 2009c). Conditions at these intersections are measured in terms of Level of Service (LOS). LOS determinations are between letters “A” indicating free flowing traffic and “F” indicating that traffic

is highly congested with long delays (Transportation Research Board 2000). LOS determinations are not considered relevant for non-peak hour conditions and therefore are only used to analyze potential impacts during peak hour traffic. Washington Department of Transportation standards indicate LOS D or greater is acceptable for urban highways and LOS C or greater is acceptable for rural highways (WDOT 2010) *see* Table 25.

Table 25. Level of Service

LOS	Delay (seconds per vehicle)
A	≤10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80

Source: Transportation Research Board 2000

SR 169/Black Diamond/Ravensdale Road Intersection – This is an un-signalized four way intersection. During a 2009 study, the AM peak hour the LOS was C or above the standard. During the PM peak hour the LOS was F. This was primarily due to west bound traffic (213 during that hour) on the Black Diamond - Ravensdale Road attempting to turn left onto SR 169. This resulted in a 94.5 second delay per vehicle turning left (Parametrix 2009c). This intersection has been proposed to the City of Black Diamond for improvements in anticipation of future residential development (City of Black Diamond 2016).

SR 169/SR 516 Intersection – This is a fully signalized intersection located within the City of Maple Valley. The intersection has five lanes in all directions and carries a LOS category D according to the draft 2015 Maple Valley Comprehensive Plan update (Maple Valley 2015). Average delay time during the peak PM hour is now 44 seconds. Peak PM traffic volumes in 2014 through the intersection were about 1,750 vehicles per hour and 21,700 total vehicles per day in all directions traveling through the intersection.

There are several different factors to consider when analyzing potential impacts to transportation. Those include the annual average daily traffic values (AADT), percent of AADT that is comprised of trucks, peak hour traffic levels which for purposes of this analysis are between the hours of 7 am – 9 am and 4 pm – 6 pm by request of King County, and LOS, *see* Table 26 [King County Department of Permitting and Environmental Review (DPER) 2014].

Table 26. Existing Traffic Conditions

Roadway	AADT (2016)	Truck Traffic[2]	Peak Hour AADT (AM/PM)[3,4]
SR 169/Maple Valley Black Diamond Road SE[1]	23,540	2,354	15,066
SR 516[1]	25,169	2,517	16,108
Black Diamond-Ravensdale Road[5]	1,752	175	1,121
Intersections			
SR 169/Black Diamond - Ravensdale Road[5]	3,875	388	2,480
SR 169/SR 516	22,716	2,272	14,538

[1] Average across all roadway sections.
[2] Assumes 10% of all AADT is truck traffic – actual percentages may vary.
[3] Peak hour occurs between 7 am – 9 am and 4 pm – 6 pm on weekdays. Column shows total traffic during all 4 hours.
[4] Assumes peak hour accounts for 16% of total daily traffic based on closest peak hour traffic recorder (SR901).
[5] Calculated value based on PM peak hour traffic as 16% of daily traffic extrapolated to 2016 values assuming a 0.9% annual growth rate.
Sources: Parametrix 2009c, WDOT 2014, WDOT 2016

Another factor considered when analyzing potential impacts to roadway traffic and safety is the minimum sight distance required for stopping and entering an area roadway without disrupting traffic. Sight distance measurements were not available from the direction of the Mine; however, Transpo Group examined entering and stopping sight distances at the SR 169 and Black Diamond – Ravensdale Road intersection from the sand and gravel mine entrance. Entering sight distance is defined as the distance necessary for a motorist to safely enter the traffic stream without causing traffic on the major street to appreciably reduce its travel speed. Stopping sight distance is defined as the distance necessary to enable a motorist to stop before reaching a stationary object in its path. King County road standards require an entering sight distance of 620 feet and stopping sight distance of 460 feet (King County 2007) at this intersection in both directions. Transpo Group measured the distances at 500 feet and 360 feet respectively in both directions thereby meeting the safety standard set by King County.

3.13.2 Environmental Consequences

For purposes of this EA, two transportation scenarios are analyzed for the Proposed Action Alternative: Scenario 1 would result in approximately 10 trucks per day during non-barge operations and Scenario 2 would result in 82 trucks over 36 hours to load barges for transport. Current traffic levels on potential truck transport routes would see less than 5 percent change in AADT. Coal haulage trucks would predominantly operate during off-peak hours while the aggregate mining operations in the area used the road during normal business hours to a much greater extent than PCCC.

3.13.2.1 Proposed Action Alternative

Under the Proposed Action Alternative, coal would be transported from the mine in trucks with trailers that average 32 tons of coal per load. PCCC's expected peak annual production is 84,000 tons; coal haulage intensity would vary depending on PCCC's coal delivery schedules

and customer location. Coal would be hauled out at the average rate of about ten (9.9) truck trips per day over seven days per week (Table 27).

The mine and plant operating hours are 6 a.m. until 10 p.m. based on King County operating and trucking restrictions. It has not yet been determined if the mine will operate one or two shifts per day but regardless, shift starting and stopping time will not coincide with the Peak hours at the intersection of Black Diamond – Ravensdale Road and SR 169. Vendor deliveries to the mine will run 5-10 deliveries per working day and will be during normal working hours.

Employee traffic from 30 full time workers would account for 60 round trips per day arriving and leaving at different points in the day depending on operating shift schedules. Even on the most congested roadway (SR 169) at 23,540 vehicles per day (*see* Table 27) the addition of 60 trips per day would only be a 0.3% increase.

The City of Black Diamond reviewed worst-case traffic impacts as discussed in this EA and the conditions King County imposed in the grading permit. Given the King County grading permit condition that prevents coal haulage during the peak traffic hours, Black Diamond determined it was satisfied that the issue of truck traffic has been adequately addressed and requires no further study (Black Diamond 2015b).

WDOT reviewed impacts to traffic on State Highways in the project area. WDOT analyzed a worst-case scenario of 82 truck trips per day over a 20-hour period accessing State Highways SR 169 and SR 516 as discussed in this EA. WDOT determined that the proposed project would have insignificant traffic impacts to SR 169 and SR 516 over the proposed 6-year period of coal haulage (WDOT 2016).

On December 24, 2014, King County Department of Permitting and Environmental Review (DPER) issued a periodic review and decision regarding PCCC's grading permit. In that decision, the County added *four* additional conditions to the grading permit to mitigate traffic impacts. The periodic review analyzed average truck traffic of only 10 trucks per day, five days per week (King County DPER 2014).

These include:

1. *All loaded trucks shall be covered.*
2. Once hauling begins, PCCC shall monitor the mine exit onto Black Diamond – Ravensdale Road for possible tracking of mud on area roadways. If it is determined that tracking is a chronic problem during inclement weather, PCCC shall have 60 days to provide a workable solution to prevent further tracking. All trucks leaving the site will be covered.

3. Loaded trucks will be limited to exiting the site westbound onto the Black Diamond – Ravensdale Road.

4. No hauling can occur during peak traffic hours; *7 am to 9 am and 4 pm to 6 pm daily*..

King County also noted that they were not aware of any capacity, safety or other impacts or concerns that would result from using that portion of the Black Diamond – Ravensdale Road from the mine entrance to SR 169 at the haulage levels proposed. PCCC has informally agreed with King County to expand the peak hour definition to 7-9 a.m. and 4-6 p.m. respectively. This agreement will be formalized before PCCC begins hauling operations in accordance with King County Grading Permit conditions (King County DPER 2014).

Subsequent to the issuance of the FEIS, PCCC constructed a wheel wash to clean trucks leaving the mine site. Dirt is removed both by the action of the truck driving through the wash and by the water sprays. Dirt would settle out in the wheel wash and not track onto the Black Diamond – Ravensdale Road. The effectiveness of this system *will* be monitored by PCCC and King County and improved if necessary to keep mud and dirt off the county road.

Since King County has directed PCCC not to haul during peak traffic hours, short-term direct traffic impacts would be negligible and short-term. Potential impacts to area intersections would also be negligible and short-term due to the avoidance of travel during peak hour and low increase in overall AADT values 0.3 – 4.5%, *see* Table 27.

Table 27. Proposed Action Traffic Conditions

Roadway	Baseline AADT (2016)	# of Mining Truck Trips per Day[6]	# of Employee Trips per day	# of Delivery Vehicles Trips per Day	Total AADT	% change	% Truck Traffic for Total AADT[2]	Peak Hour for Total AADT (AM/PM)[3,4]
SR 169/Maple Valley Black Diamond Road SE[1]	23,540	19.8	60	20	23,640	0.42%	2,364	15,129
SR 516[1]	25,169	19.8	60	20	25,269	0.39%	2,527	16,172
Black Diamond-Ravensdale Road[5]	1,752	19.8	60	20	1,852	5.39%	185	1,185
Intersections								
SR 169/Black Diamond - Ravensdale Road[5]	3,875	19.8	60	20	3,975	0.42%	2363.98	15,129
SR 169/SR 516	22,716	19.8	60	20	22,816	0.42%	2,282	14,602

[1] Average across all roadway sections.
[2] Assumes 10% of all AADT is truck traffic – actual percentages may vary.
[3] Peak hour occurs between 7 am – 9 am and 4 pm – 6 pm on weekdays. Column shows total traffic during all 4 hours.
[4] Assumes peak hour accounts for 16% of total daily traffic based on closest peak hour traffic recorder (SR901).
[5] Calculated value based on PM peak hour traffic as 16% of daily traffic extrapolated to 2016 values assuming a 0.9% annual growth rate.
[6] 19.8 truck trips per day equals 1 loaded truck and 1 unloaded truck for the average of 9.9 trucks per day
Sources: Parametrix 2009c, WDOT 2014, WDOT 2016

3.13.2.1.1 Barge Transport

Hourly truck traffic intensity depends on various factors. For example, barge loading could occur in Tacoma, Seattle or possibly at other barge loading sites in Puget Sound where coal stockpile capacity and barge loading rate would determine peak trucking conditions. PCCC has not yet selected a proposed barge loading site or sites but it is assumed that all suitable barge sites would be accessible by the proposed trucking routes. That will depend on market conditions when production begins. It is assumed that trucks would directly discharge onto conveyors which load onto barges or into trucks which directly dump on the barge. The worst-case condition is when 4,000-ton barges would be loaded over a minimum of 36 hours. This scenario results in truck traffic of four truck trips per hour or 82 truck trips over a 20.5-hour day. As shown in Table 27, area roadways have enough capacity to accommodate the increase of 82 truck trips per day for barge loading.

With 84,000 tons per year production and 4,000 tons per barge, 21 barges per year, or about one every two weeks, are required if all production is barged. The haul route would be southwest along the Black Diamond – Ravensdale Road to SR 169 then north to the intersection of SR 169 and SR 516. For coal delivery to Seattle customers or a Seattle barge loading site, the trucks would continue north on SR 169 to I-405 and then on I-405 to I-5. For coal delivery to customers or a barge loading site located in Tacoma or further south, the trucks would turn west on SR 516 and proceed to SR 18 and then onto I-5 into Tacoma. Exact trucking routes for barge offloading at the Port of Richmond in British Columbia to the cement plant in Delta, BC are unknown but would be expected to experience the same level of traffic on area roadways (82 truck trips per day). However, the distance between the port and offload site is much shorter (approximately 1 mile) than the original loading from the Mine to the port.

According to the U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center, the Port of Seattle handled 99,499 vessel trips and the Port of Tacoma handled 39,482 vessel trips, of foreign and domestic cargo, in 2014 (USACE 2016). The barges used to transport coal would be subject to the vessel traffic service regulations established under the Ports and Waterways Safety Act and managed by the U.S. Coast Guard while traveling in Puget Sound (USCG 2015). Since the route from Port of Tacoma or Port of Seattle to the Port of Richmond in British Columbia is heavily traveled daily, the addition of 21 barges *per year* traveling through the Puget Sound Waterways and loading and unloading at port facilities would be negligible and short-term.

3.13.2.1.2 Emergency Services

Emergency service vehicles response time delays can result from several factors including potential traffic congestion. Under the Proposed Action Alternative, daily increases to roadway traffic would be minimal and would avoid travel during peak hour conditions where emergency services would experience the most delay due to traffic congestion. Therefore, potential impacts to emergency service vehicles would be negligible and short-term.

3.13.2.2 No Action Alternative

Under the No Action Alternative, coal would not leave the mine site. Approximately 20 people will be employed during the two years of reclamation and will travel to the site in the morning and leave in the late afternoon or evening. Normal operating hours are 6 am until 10 pm. Employee and vendor traffic into and out from the mine will likely be outside peak hours at the intersection of Black Diamond – Ravensdale Road and SR 169 due to shift schedules accommodating potential mine operation hours of 7 am – 10 pm. Shift one would need to arrive before 7 am and would leave in mid-afternoon with second shift starting mid-afternoon and leaving in the late evening. Impacts to traffic associated with reclamation would be negligible, short-term, and local. Under the No Action Alternative, coal would not leave the mine site and therefore would not result in any barge traffic or delays to emergency services. Indirect impacts would be negligible and short-term.

3.14 Recreation

3.14.1 Affected Environment

There are no parks or recreational facilities located within one mile of the Mine. The City of Black Diamond maintains a three-acre park in the middle of the city adjacent to the Black Diamond elementary school. This school is located approximately 5,300 feet from the current disturbed area of Pit 2, and just over 4,000 feet from Pit 2 at its closest approach under the Proposed Action Alternative, which would be estimated to occur in 2017 – 2018. The elementary school is currently undergoing renovations and will reopen in fall 2017 (Enumclaw School District 2016). The school is approximately 2,000 feet from the John Henry No. 1 Mine Revision Permit boundary (King County 2016). The school and the park provide space for little league baseball and soccer practice and games and has basketball courts, tennis courts, and a new skateboard arena.

Lake No. 12 located east of the permit boundary is a recreational and residential lake. Recreational uses include fishing and swimming. Lake Sawyer is located over a mile west of the western permit boundary and is also a residential and recreational lake. In addition to fishing Lake Sawyer supports a variety of water sports during the summer including water skiing and wake boarding.

3.14.2 Environmental Consequences

The mine property was privately owned land and was not used for recreational purposes before mining began in 1986. The approved post-mining land use does not include recreational uses. There have been no direct adverse environmental impacts observed from the mine's historic operation on either Lake No. 12 or Lake Sawyer recreational activities. As described in Section 3.15, *Visual Resources*, any potential visual impacts to recreational users has been diminished by the vegetation barrier along the Green River Gorge Road.

3.14.2.1 Proposed Action Alternative

There are no parks or recreational facilities located within one mile of the Mine therefore there would be no direct impacts from the Proposed Action Alternative. There are no parks or recreational facilities located within one mile of the Mine therefore there would be no indirect impacts from the Proposed Action Alternative.

3.14.2.2 No Action Alternative

There are no parks or recreational facilities located within one mile of the Mine therefore there would be no direct impacts from the No Action Alternative. There are no parks or recreational facilities located within one mile of the Mine therefore there would be no indirect impacts from the No Action Alternative.

3.15 Noise and Vibration

3.15.1 Affected Environment

King County Noise Ordinance No. 3139 and the Washington Administrative Code, Chapter 173-60, require that the basic permissible sound level during daytime hours of operation be less than 57 dBA at the receiving rural residences in unincorporated King County (including those residences around Lake No. 12 and the Diamond Ridge Acres subdivision) and less than 60 dBA for the offsite residential properties in Black Diamond. Prior to mining, PCCC commissioned a Noise Mitigation Study (Towne, Richards and Chartiere, Inc. 1983). This study is included as Appendix III-4 of the PAP (PCCC 2011a). Noise mitigation berms including Spoil Pile 1, the berm along the east edge of the mine site, Spoil Pile 2 and Spoil Pile 3 South were constructed and were effective at mitigating noise impacts on surrounding residents as no noise complaints were filed with King County that would have potentially required additional monitoring. Spoil Pile 1 primarily served to attenuate noise from coal processing activities. In addition, the coal processing plant was enclosed to minimize noise.

A source of potential noise and vibration impacts would be from blasting the rock overburden prior to haulage and backfilling. All blasts are designed by a licensed blaster to ensure that they are conducted in a controlled manner and achieve compliance with all regulations. Blast holes are drilled in a fixed pattern to a depth of 25 feet below ground surface. The blast holes are loaded with explosives and detonated in a controlled manner and sequence to minimize vibration and fly rock. Blasting would occur only during daylight hours and the proposed schedule would be published every 12 months in a local newspaper. As a condition of its King County Grading Permit, PCCC would only be allowed to blast between the hours of 10 am and 4 pm (King County DPER 2014). Noise levels associated with mining activities and ground vibrations from blasting attenuate with distance. They are expected to be perceptible, but not significant, outside the proposed mining area. PCCC is responsible for maintaining records of all blasts.

OSMRE concluded in the 1985 FEIS that based upon the blasting procedures outlined in the PAP, blasting operations would not produce ground vibrations in excess of 0.3 inch per second

(maximum peak particle velocity) at the closest structure not owned and/or occupied by the operator. Vibrations of this magnitude would not cause damage to structures but would be perceptible to humans and animals (OSMRE 1985). Vibration impacts related to blasting under the Proposed Action Alternative would follow the same procedures analyzed in the 1985 FEIS and therefore vibration impacts would be similar in nature.

3.15.2 Environmental Consequences

To mitigate noise impacts, King County set defined hours for mining operations that run 6 am until 10 pm on weekdays. In accordance with King County's rezone ordinance, this restriction does not apply to truck traffic in and out of the mine (King County 1985). Vibration from blasting under the Proposed Action Alternative would be controlled as required in the regulations (30 CFR 816.61-68). PCCC's approved blasting plan can be found in Section 3.3.2 of the PAP.

Potentially negative impacts from blasting are controlled in a number of ways. Spoil Piles 3 North and 3 South and the berm along the eastern edge of the mine site act to reduce the impact of noise from blasting on the local community. Blasting operations are done in compliance with the Federal performance standards at 30 CFR §§ 816.61 through 816.68. Condition 9006 of the King County Grading Permit limits blasting to the hours between 10:00 am until 4:00 pm.

During the first three years of mining under the Proposed Action Alternative the minimum distance to the nearest non-mine structure is 1,005 feet. As the mine advances to the west it would terminate 530 feet from the nearest structure located on SE 310th Street. There is also a small-scale residential community located across the street from the mine entrance/exit. The Black Diamond elementary school is located approximately 5,300 feet from the current location of Pit 2, and just over 4,000 feet from Pit 2 at its closest approach under the Proposed Action Alternative, which would be estimated to occur in 2017 – 2018.

3.15.2.1 Proposed Action Alternative

Noise levels would increase in the vicinity of residents off of SE 310th Street from mining operations and increased traffic at the mine entrance/exit at the residential development across the street. Construction equipment used during mining operation would not exceed standards set in the King County Code 12.86.520 for operation of heavy equipment and King County Code 21A.22 for mineral extraction. Under the truck transport scenario, increased transportation noise would be negligible because the additional traffic would only result in a less than 5 percent increase on area roadways and any truck noise associated with entering or exiting the mine would be short-term and last only a few minutes 3 to 4 times per day. Under the barge transport scenario, there would be 82 trucks entering/exiting the mine within a 36 hour period resulting in increased noise levels for the residential development across the street. Trucks used to transport coal would conform to King County Code 12.86.200 and King County grading permit standards and not exceed the maximum permissible sound levels under WAC 173-62-030. Those standards state for all motor vehicles over 10,000 pounds the maximum sound level (dBA) for 45 mph or less is 86 dBA, over 45 mph is 90 dBA and stationary is 86 dBA. Although the number of trucks is greater than the 10 trucks per day, 82 trucks within a 36-hour period are

still less than 15 percent increase to AADT levels on area roadways. Noise impacts related to barge transport would be considered minor and short-term.

Noise impacts to the Black Diamond elementary school are expected to be negligible and short-term due to its distance from mining operations (approximately 1 mile) and potential coal hauling routes. Any increase in noise levels would be dissipated by natural topographic and manmade features before reaching the school.

As discussed in the King County grading permit, DPER utilizes noise sampling equipment periodically during inspections and if it's determined that an exceedance of the standards may be occurring it can require the permittee to provide a supplemental noise study with proposed mitigations to address the issue (King County DPER 2014). It should also be noted that King County recently amended its Noise Ordinance to shift the enforcement focus for neighborhood noise from solely technical decibel limits to public disturbance provisions. A "public disturbance" is "any sound that unreasonably disturbs or interferes with the peace, comfort or repose of a person or persons."

Reclamation activities take place away from most surrounding residential areas. The exceptions are the reduction in volume and size of Spoil Pile 1 near Lake No. 12, Spoil Pile 3 South near Lawson Hills Estates and Spoil Pile 3N near one residence along SE 310th Street. This activity uses the same equipment as used elsewhere, namely articulated trucks and excavators in the case of the Proposed Action Alternative. In each instance, as layers of the spoil piles are removed to achieve AOC, the outer edge of the pile would be mined last. This allows most overburden removal activities to take place behind that outer edge which creates an effective temporary noise mitigation berm. This does not mitigate noise when the outer edge of the layer is removed but it does mitigate it during much of the spoil pile removal activities. As only the upper levels of the spoil piles are removed to achieve AOC, this activity occurs 100-200 feet farther from local residences as when the spoil piles were constructed.

Noise would also occur as trees are removed on the spoil piles. All reclamation activities related to reduction in size of the spoil piles would occur during "limited hours" in accordance with the King County grading permit. Under King County Code 12.86.500, sounds originating from forest harvesting and silviculture are exempt any time from King County noise restrictions in a rural, commercial or industrial district in King County. Such sounds are also exempt during the daytime for all other districts (KCC 12.86). Trees would likely be removed with mechanized equipment. The noise impacts associated with tree removal are expected to be similar to impacts from mining and reclamation equipment as logging uses similar equipment powered by similar engines. In the case of timber removal direct impacts would be extremely short-term (less than one month) and minor.

Blasting would occur in a controlled manner that limits vibration. Blasts would be controlled and monitored as required by OSMRE regulations at 30 CFR § 816.67. Specific permit stipulations required under the Proposed Action Alternative as described in the PAP (PCCC 2011a) include:

- Blasting operations would be limited to occur between the hours of 10 am and 4 pm;
- The blasting schedule would be published in a local newspaper once each year;
- Pre-blast surveys would be conducted if requested by property owners;
- Blasters would be required to be certified by OSMRE;
- Blast designs would be required to be submitted to and approved by OSMRE if blasting within 1,000 feet of a structure were to occur;
- An audible blast warning and all-clear signals, covering a range of ½ mile from the proposed blast location, would be provided;
- Air blast limits set by 30 CFR § 816.67(b) would be adhered to;
- Vibration limits set by 30 CFR § 816.67(d) would be adhered to;
- Guards would be posted on adjacent public road to restrict traffic during blasts;
- Nearby properties would be periodically monitored to ensure compliance with Federal air and vibration blast standards.

Direct impacts from mining operation, coal transport, and reclamation noise and blasting are expected to be minor and short-term, mostly confined within the mine site but could be local at times. PCCC must comply with both King County and Federal regulations related to noise and blasting. OSMRE periodically monitors potential noise and vibration impacts to ensure compliance with OSRME regulations. Noise and vibration impacts would be restricted to the mine permit area and would not result in any indirect impacts.

3.15.2.2 No Action Alternative

Reclamation activities under the No Action Alternative would take place away from most surrounding residential areas, with exception of Spoil Pile 1 near Lake No. 12 and Spoil Pile 3 South near Lawson Hills Estates. In each of those instances, most overburden removal activities would take place behind a temporary berm that would be reduced in size as the height of the spoil pile is reduced. Noise impacts would be further avoided by the operating hour restrictions (7:00 am – 10:00 pm) imposed by the King County and Black Diamond rezone ordinances and grading permits. Since the haul road is located in the middle of the mine area, noise impacts at the permit boundary or closest residence would likely be less than what would be expected to occur under the Proposed Action Alternative. Under the No Action Alternative, noise levels would be periodically monitored as required by King County as discussed above and, noise mitigation efforts would be implemented if required to meet King County regulations. Blasting is not required and there would be no vibration impacts under the No Action Alternative. Noise impacts would be local, short-term, and minor because PCCC must comply with King County noise regulations. Noise and vibration impacts would be restricted to the mine permit area and would not result in any indirect impacts.

3.16 Visual Resources

3.16.1 Affected Environment

As a condition of the 1985 King County rezone ordinance (King County, 1985), PCCC was required to construct a wooden fence along the Green River Gorge Road. In 2003, subsequent to the construction of the Tacoma Pipeline along the Green River Gorge Road, King County

allowed PCCC to remove the wooden fence and replace it with a vegetation barrier. Based on visual resource standards established in the BLM's Visual Resource Inventory Manual the visual resources in the Mine would most likely be considered a Class III or Class IV with moderate to least value (BLM 1986).

3.16.2 Environmental Consequences

The vegetation barrier along the Green River Gorge Road has developed since it was planted in 2003. It is currently an effective visual barrier that separates the mine from the Green River Gorge Road. Douglas fir trees were planted on approximately eight foot centers along the relatively steep slope as required by King County. The success rate in 2008, after five years, was about 90 percent and the trees are now 8 to 12 feet high. This success rate has not changed since 2008 and the trees continue to grow. In addition, natural volunteer vegetation of deciduous trees, including alder and maple, has populated the corridor and these supplement the Douglas fir plantings. Visual impacts to residences surrounding the mine were minimized once the spoil piles and noise mitigation berm were constructed from 1986 – 1992.

3.16.2.1 Proposed Action Alternative

Proposed mining and ongoing reclamation activities would be visible from surrounding residential properties. The height of Spoil Pile 1 and Spoil Pile 3 South would be reduced and some visual connection with external properties may occur. This would be controlled by sequencing spoil removal such that loading operations would take place behind a berm. These effects, if they occur, would constitute a direct, minor, and short-term impact and would be confined within or adjacent to the permit boundary. Visual impacts would be restricted to the mine site and therefore no indirect impacts would occur.

3.16.2.2 No Action Alternative

The No Action Alternative would have the same visual impacts as the Proposed Action Alternative during reclamation. No additional impacts are foreseeable. The direct impacts would be minor and short-term and confined within or adjacent to the permit boundary. Visual impacts would be restricted to the mine site and therefore no indirect impacts would occur.

3.17 Cultural Resources

3.17.1 Affected Environment

An archeological survey of the mine site was conducted in 1983 by Dr. Brian G. Holmes (Holmes 1983). No prehistoric sites were located but evidence of past underground mining was noted. No additional cultural resources have been encountered since mining began in 1986. The Washington State Office of Archeology and Historic Preservation has concluded that the mine would have no effect on known cultural resources included in or eligible for inclusion in the National Register of Historic Places (Washington Office of Archeology and Historic Preservation 1984).

3.17.2 Environmental Consequences

Due to the absence of cultural resources, there would be no impacts or need for mitigation under either the Proposed Action Alternative or the No Action Alternative. Should unreported cultural resources be discovered during future mine operation under either the Proposed Action or the No Action Alternative, such discovery would be reported and work would cease in the area until the discovery can be evaluated by a qualified archeologist.

3.17.2.1 Proposed Action Alternative

There are no direct *or indirect* impacts on cultural resources from the Proposed Action Alternative.

3.17.2.2 No Action Alternative

There are no *direct or indirect* impacts on cultural resources from the No Action Alternative.

3.18 Human Health and Safety

3.18.1 Affected Environment

The affected environment for public health and safety includes the mine operations and individuals who could be exposed to dust, noise, heat stress, and chemicals from PCCC's mining and reclamation activities. Many activities conducted during mining operations carry inherent health and safety risks. Typical risks encountered include exposure to dust, noise, heat stress, and chemicals, as well as the opportunity for accidents due to working directly with or in proximity to large equipment. Procedures used during operation and maintenance activities associated with the project, such as blasting or construction, also pose health and safety risks. However, the establishment of appropriate policies and procedures, and the monitoring of those procedures to verify that they are properly observed, helps to reduce the risk involved. The Federal Mine Safety and Health Act (MSHA) of 1977 regulates mine employee health and safety associated with PCCC's operations. During mining and reclamation, permits will be required along with safety inspections to minimize the frequency of accidents and maximize worker safety. PCCC's MSHA mine identification number is 45 02967. MSHA inspectors normally complete a full inspection every six months but can inspect as frequently as they deem necessary to ensure compliance with the regulations. Inspections do not take place when the mine is idle for extended periods of time.

This section brings forward pertinent information from the other affected environments and examines potential impacts associated with the Proposed and No Action Alternative from a human health and safety perspective.

PCCC utilizes a number of different mechanisms to ensure that public health and safety is adequately maintained throughout the mine's operations. These existing measures are described below.

3.18.1.1 Dust and Debris

Dust and debris on roads is reduced by the use of a wheel washing facility prior to trucks exiting the mine area.

3.18.1.2 Site Access

"No Trespassing" signs are posted around the property to warn the public of the dangers within the mine site. When staff is not present on the mine site, all access gates are locked.

3.18.2 Environmental Consequences

Health and safety at John Henry No.1 Mine is managed by establishing appropriate policies and procedures and monitoring those procedures to verify that they are properly observed and executed. PCCC's safety and health standards include requirements for ground support systems, coal piles, electrical systems, combustible fluid storage, shops, equipment specifications and maintenance, explosives storage and handling, dust control, monitoring and reporting requirements, alarm systems, worker personal safety equipment, and restrictions for public access. To comply with MSHA standards, all mining and reclamation operations will require the necessary MSHA mine permit, an MSHA-approved miner-training plan, and escape and evacuation plan since work carried out in the presence of heavy equipment and machinery inherently bears a degree of risk. It is acknowledged that air quality is also a health and safety consideration which is considered in terms of NAAQS under Air Quality Section E.1.7. NAAQS are determined based on the USEPA's assessment of health-protective air quality levels. In addition, transportation at and near the mine site also poses risk for workers as well as the public.

3.18.2.1 Proposed Action Alternative

Under the Proposed Action Alternative the current health and safety practices, described above, PCCC would continue to implement a health and safety program to protect employees and the public. PCCC's health and safety requirements would comply with current health and safety requirements in its standard operating procedures, and compliance with mandated safety rules will continue to be required. Safety risks would be present, including exposure to dust, noise, heat stress, and chemicals. The opportunity for accidents due to working directly with or in proximity to large equipment will also continue.

3.18.2.1.1 Climate Change

While there will be impacts on human health from global climate change, assessing specific impacts from either the Proposed or No Action Alternative would be speculative and not discernible.

3.18.2.1.2 Air Quality

The State of Washington implements the Federal NAAQS, and develops air quality attainment and maintenance plans, in order to keep Washington in compliance with the NAAQS standards. NAAQS are determined based on the USEPA's assessment of health-protective air quality levels. The Puget Sound airshed has been in compliance with the annual $PM_{2.5}$ standard since the EPA promulgated it in 1997 (PSCAA 2014). The Black Diamond area is in compliance with the Federal air quality standards for these pollutants (PSCAA 2014). Mining at the historic maximum rate of 350,000 tons per year showed negligible impacts on local or regional air quality. Negligible impacts are defined as human health and safety will not be affected, or the effects will not be measurable or perceptible using standard scientific tests. Under the Proposed Action Alternative, mining at the proposed rate of 130,000 tons per year would have even lower

impacts. PCCC is not required to implement an air quality monitoring program, but does maintain a dust control program.

As noted in Section 3.5, *Air Quality*, in an effort to prevent off site impacts and to protect worker health and safety, all active roads within the mine site are watered as necessary during dry or dusty conditions. The temporary spoil piles were covered with topsoil, seeded, and revegetated. Coal waste is mixed with overburden in the backfill area and not stored separately. Coal stockpiles are watered as necessary, but this is not frequent due to relatively damp weather conditions. As topsoil is spread it is immediately reseeded and with favorable growing conditions, vegetation establishes quickly. This has proven an effective means of controlling fugitive dust emissions. No thermal dryers are used, but the preparation plant feed hopper and the crushers at the coal preparation plant are equipped with water spray devices to minimize dust. The blast hole drill also uses water to minimize dust from the drilling operations. Disturbed acreage is kept to a minimum, and is topsoiled and seeded as soon as possible to eliminate possible sources of dust.

BACT is applied where required at the coal processing plant. Application of BACT helps PCCC to attain limits for coal processing and conveying equipment (including breakers and crushers), coal storage systems, transfer and loading systems, open storage piles (of processed coal and refuse), and associated equipment. PCCC's plant operating and maintenance plan targets no visible emissions from coal processing and conveying equipment. Specifically:

- The enclosed crusher with water sprays is BACT;
- If the material was dry, fully enclosed conveyors would be BACT, in this case given the wetness of handled product conveyor covers are BACT;
- Enclosed coal preparation plant is BACT.

Impacts on air quality from the Proposed Action Alternative are generally confined within the permit area but potentially could be local. The impacts are short-term and negligible due, in part, to the fact that prevailing winds in the dry summer months are from the North and Northwest and the land use to the South and Southeast is forest with no residences.

Federal regulations, enforced by MSHA, require worker dust monitoring to protect worker health. PCCC must comply with these regulations.

3.18.2.1.3 Water Resources

As is demonstrated in the CHIA, the Proposed Action Alternative would have little impact on water resources outside the permit area. The City of Black Diamond obtains its water from two external sources that are not impacted by mine activities. There are no known future water users that may be impacted. Water discharges are strictly regulated by WDOE through the NPDES Permit. Water is sampled and tested on a regular basis to make sure it meets appropriate standards to protect public health. Ground water impacts would be minor due to some noticeable drawdown on one off-site well (Reichert well) that is monitored in accordance with OSMRE and WDOE regulations, *see* Section 3.4.2, *Groundwater*. Impacts on public health and safety would be negligible and short-term. There were no reported adverse impacts on

downstream water users while the mine operated at full production and none are expected at the lower production levels predicted under the Proposed Action Alternative.

3.18.2.1.4 Transportation

Coal trucks leaving the mine enter onto the Black Diamond – Ravensdale Road which is a county Tier 2 road. Tier 2 roads provide generally reliable access, are heavily travelled, provide access to smaller geographical areas, and serve as alternatives to Tier 1 roads. Tier 2 roads receive a lower level of storm and snow response, receive maintenance to keep them in good condition and, in general, preservation efforts would be more reactive and prioritized based on level of risk and availability of funding. DPER have determined that it is not aware of any safety impacts or concerns that would result from the level of traffic expected under the Proposed Action Alternative (King County DPER 2014).

Under the Proposed Action Alternative, indirect impacts related to the transport of coal including potential impacts to emergency service response times on area roadways, as described in Section 3.13.2.1.2.2, *Emergency Services*, would occur resulting in minor and short-term impacts to human health and safety. The projected delay in emergency service response times on transportation routes used for hauling coal from the John Henry No. 1 Mine are uncertain due to the different transportation methods and routes that could be used, *see* Section 3.13, *Transportation*.

3.18.2.1.5 Vegetation and Wildlife

There is no evidence that there would be any adverse impacts on food sources including fish under the Proposed Action Alternative. There is no commercial farming in the general area. Water quality is strictly monitored by WDOE through the NPDES permit and there is no evidence that water quality in the upper Green River basin has had any adverse impact on Puget Sound Chinook or Puget Sound Steelhead runs.

3.18.2.1.6 Noise and Vibration

King County noise limits are set to prevent detrimental health impacts. Under the Proposed Action and No Action Alternatives, PCCC must comply with those regulations. Blasting operations would occur. Residents would be offered pre-blast survey and would continue to be notified and warned of blasting operations, and notification of the blasting schedule will continue to be posted and advertised. Blasts will continue to be monitored for air blast and ground vibration. PCCC mine's blasting records will continue to be monitored by OSMRE on a monthly to quarterly basis. Vibration performance standards under SMCRA were established to prevent adverse impacts to protected structures, detrimental health impacts to citizens and mine employees and are monitored for each blast. MSHA has strict noise limits to protect mine worker safety and health that the operator must comply with.

3.18.2.2 No Action Alternative

Under the No Action Alternative mining activities will not resume and public health and safety risks related to coal-production operations and blasting would not occur. During the reclamation period, PCCC would continue to comply with all applicable federal, county, and state rules and regulations regarding health and safety and handling and disposal of hazardous materials and

wastes. Safety procedures regarding on site truck traffic will continue to be followed throughout the duration of reclamation activities, although fewer vehicles will be required for these activities. Impacts resulting from cessation of mining activities on public health and safety in terms of job-related accidents would be negligible and short-term. Under the No Action Alternative, coal would not leave the mine site and therefore would not result in any indirect transportation of coal resulting in no impacts to human health or safety.

3.19 Short Term Uses and Long Term Productivity

The NEPA regulations at 40 CFR § 1502.16 require a discussion of the "relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity."

3.19.1 Local Area

In the long term, following reclamation under either alternative, the land surface would be topographically lower and, although the reclaimed surface would resemble original contours, it would lack some of the original diversity of geometric form.

Soils and vegetation have been disturbed and the associated wildlife habitat that the John Henry No. 1 Mine previously provided before mining operations began has been lost in the short term, during mining and reclamation. Soils would be replaced and vegetation would be restored, as required by the mining plan.

There would be loss and displacement of wildlife in the short term but, based on monitoring of previously reclaimed lands on other coal mines within the U.S., it is anticipated that the reclaimed lands would provide habitat that would support a diversity of wildlife species similar to pre-mining conditions over the long term.

Mining operations and associated activities would degrade the air quality and visual resources of the area on a short-term basis. Following coal removal, removal of surface facilities, and completion of reclamation, there would be no long-term impact on air quality. The long-term impact on visual resources would be minor.

The short-term economy of the region would be enhanced as a result of the Proposed Action Alternative. Mining at the John Henry No. 1 Mine would last up to six years with one year of reclamation activities under the Proposed Action Alternative.

3.19.2 Greenhouse Gas Emissions

GHGs have been raised as a concern due to the greenhouse effect. The greenhouse effect is a theory that certain gases in the atmosphere impede the release of radiation from the earth, trapping heat in the atmosphere like glass over a greenhouse. GHGs currently include carbon dioxide (CO2), methane (CH4), water vapor, ozone, and nitrous oxide (NO2). If the coal in the John Henry No. 1 Mine is mined, additional GHGs would be released into the atmosphere. A discussion of emissions and by-products that are generated by burning coal to produce electricity is included in Chapter 3, Section 3.5.2 of the EA. Under the Proposed Action

Alternative, mining and continuous reclamation activities would result in 71,690 MT CO2e/y and reclamation activities would result in 3,137 tons of CO2e MT CO2e/y (*see* Table 8, *Summary of Direct and Indirect CO_2e Emissions Proposed Action Alternative*).

3.20 Irreversible or Irretrievable Commitments of Resources

The major commitment of resources would be the mining and consumption of 737,000 short tons of minable coal reserves under the Proposed Action. It is estimated that <1 percent of the energy produced would be required to mine the coal, and this energy would also be irretrievably lost.

The characteristics of topsoil would likely be irreversibly changed. Soil formation processes, although continuing, would be irreversibly altered during mining-related activities. Newly formed soil material would be unlike that in the natural landscape.

Direct and indirect wildlife deaths caused by mining operations or associated activity would be an irreversible loss.

Loss of life may conceivably occur due to the mining operations and vehicular traffic. According to the MSHA the John Henry No. 1 Mine did not have any fatal or reported injuries for contractors or mine employees from 2014 - 2017 (MSHA 2016). Any injury or loss of life would be an irretrievable commitment of human resources.

There are no known historic and prehistoric sites on the mine areas. However, disturbance of any encountered historic and prehistoric sites on the mine areas would be mitigated to the maximum extent possible. However, accidental destruction of presently unknown archeological or paleontological values would be irreversible and irretrievable.

3.21 Summary of Impacts to the Affected Environment Under the Proposed Action Alternative

A summary of the anticipated impacts to the Affected Environment under the Proposed Action Alternative is provided in Table 28.

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Table 28. Impact Assessment Summary for the Proposed Action Alternative

Resource	Assessment Approach	Impact Designation and Assessment			Intensity Definition	Permit Stipulations, Design Features, and Best Management Practices
		Direct or Indirect[1]	Short- or Long-Term	Intensity		
Topography	Evaluation of Final Mine Topography and Required Spoil Movement Associated with each Alternative	Direct	Long	Minor	A change in slope or elevation that will be detectable and long-term but will resemble the AOC of undisturbed landforms within the permit area.	Contemporaneous reclamation; reclamation to AOC.
Geology	Evaluation of the Mining Plan and Coal Extraction Associated with each Alternative	Direct	Long	Moderate	Changes that will not result in a loss of scientific and educational values for geologic and paleontological resources or potential mineral resource development.	Contemporaneous reclamation.
Water Resources and Hydrology	Evaluation of Historic Data; Water Quality Modeling of Phosphate	Direct and Indirect	Short	Minor and Negligible (groundwater quantity)	•Changes in water quality at NPDES outfalls that sometimes (0-33%) exceed applicable water quality standards. •Changes in yearly average flow from NPDES discharges which have a measurable effect on downstream watersheds. •Changes in water quality that occasionally (0%-33%) exceed applicable water quality standards and are attributable to mining.	Contemporaneous reclamation; maintenance of sedimentation structures, proper handling of spoil, topsoil, and coal processing waste materials.

Resource	Assessment Approach	Impact Designation and Assessment			Intensity Definition •Mining related drawdown which can be quantified at water supply wells outside the permit area.	Permit Stipulations, Design Features, and Best Management Practices
Climate	Evaluation of Greenhouse Gas Emissions	Direct and Indirect	Short	Negligible	Causing no discernible impact on global climate. .	Use high efficiency equipment.
Air Quality	Evaluation of criteria pollutants and HAPs relative to standards	Direct and Indirect	Short	Negligible	Maintaining PM_{10} and $PM_{2.5}$ levels below PSCAA modeled levels and opacity levels on the coal preparation and handling facilities at less than 10%.	Watering mine roads for dust suppression; cleaning trucks leaving the permit area. Existing controls at coal combustion facilities.
Soils	Evaluation of the Proposed Mining and Reclamation Plans	Direct	Long	Moderate	Soils will not be affected by erosion and the effects on soil productivity will be below the levels of detection with no long-term effects.	Use of 4 feet of topsoil or suitable material as a plant growth medium for reclamation.

Resource	Assessment Approach	Impact Designation and Assessment			Intensity Definition	Permit Stipulations, Design Features, and Best Management Practices
Vegetation	Evaluation of T&E Plant Species and the Mining and Reclamation Plans	Direct and Indirect	Long	Minor = Direct Negligible = Indirect	Direct effects on vegetation community structure and composition that will be limited to areas disturbed by mining and reclamation with no changes in the plant community structure or composition elsewhere in the permit area.	Timely seeding and revegetation of disturbed areas.
Wetlands	Evaluation of Potential Wetlands	Direct	Long	Minor	Direct effects on wetlands removal that would be limited to areas disturbed by mining and reclamation with no changes in the plant community structure or composition elsewhere in the permit area.	Minimizing the amount of disturbed area; preservation of Mud Lake Wetlands.

Resource	Assessment Approach	Impact Designation and Assessment			Intensity Definition	Permit Stipulations, Design Features, and Best Management Practices
Fish & Wildlife	Evaluation of T&E Species and other Wildlife	Direct and Indirect	Short and Long	Minor = Wildlife Negligible = Birds and Fish	Effects on wildlife species could be detectable and long- and short-term. The effects will be limited to local changes to the population.	Minimizing the amount of disturbed area; preservation of Mud Lake Wetlands.
Land Use	Evaluation of Pre and Post Mining Land Uses	Direct	Short	Minor	There will be no changes to existing or future land use.	Reestablishment of land uses that existed prior to mining.
Socioeconomics	Evaluation of Potential Mine Employment and Environmental Justice	Direct and Indirect	Short	Negligible	Effects on the socioeconomic environment will not be distinguishable from changes that were occurring from other social and economic activities within the surrounding communities.	Hire local employees and contractors.
Transportation	Evaluation of Potential Coal Truck and Other Traffic	Direct and Indirect	Short	Negligible	There will be no discernible changes to existing traffic patterns at key intersections.	Use of wheel washers prior to trucks exiting the mine site.
Recreation	Evaluation of the Proposed Action's Effects on Recreation in the Area	None	None	None	Recreational activities will not be affected or changes in use and/or experience will be below or at the level of detection by the recreational user.	No recreation sites exist within 1-mile of the permit boundary.
Noise and Vibration	Evaluation of Previous Noise and Vibration Complaints	Direct	Short	Minor		Use of noise mitigation berms, following the

Resource	Assessment Approach	Impact Designation and Assessment			Intensity Definition	Permit Stipulations, Design Features, and Best Management Practices
						performance standards 30 CFR 816.
					Noise levels will be detectable from current levels but will not exceed King County noise standards. Vibrations associated with blasting would occur but would not exceed regulatory limits.	
Visual Resources	Evaluation of the Mining and Reclamation Plans	Direct	Short	Minor	Change to the visual appearance of the site will generally be noticeable but subtle. It will usually be subordinate, but will be noticed by viewers without being pointed out.	Sequencing spoil movement, utilizing berms and other barriers.

Resource	Assessment Approach	Impact Designation and Assessment			Intensity Definition	Permit Stipulations, Design Features, and Best Management Practices
Cultural Resources	Archaeological Survey	None	None	None	No impacts.	No prehistoric sites are known to exist at the Mine.
Human Health and Safety	Evaluation of Public Health and Safety related to air quality, water resources, transportation and noise and vibration	Direct or Indirect	Short	Negligible	Human health and safety will not be affected, or the effects will not be measurable or perceptible using standard scientific tests.	Mandated safety rules and standard operating procedures for blasting. See air quality, water resources, transportation and noise and vibration.

[1] Where indirect impacts aren't designated in the Table the resource area analysis determined that impacts associated with the Proposed Action would only occur within the mine permit boundary and therefore would not result in indirect impacts.

4.0 CUMULATIVE IMPACTS

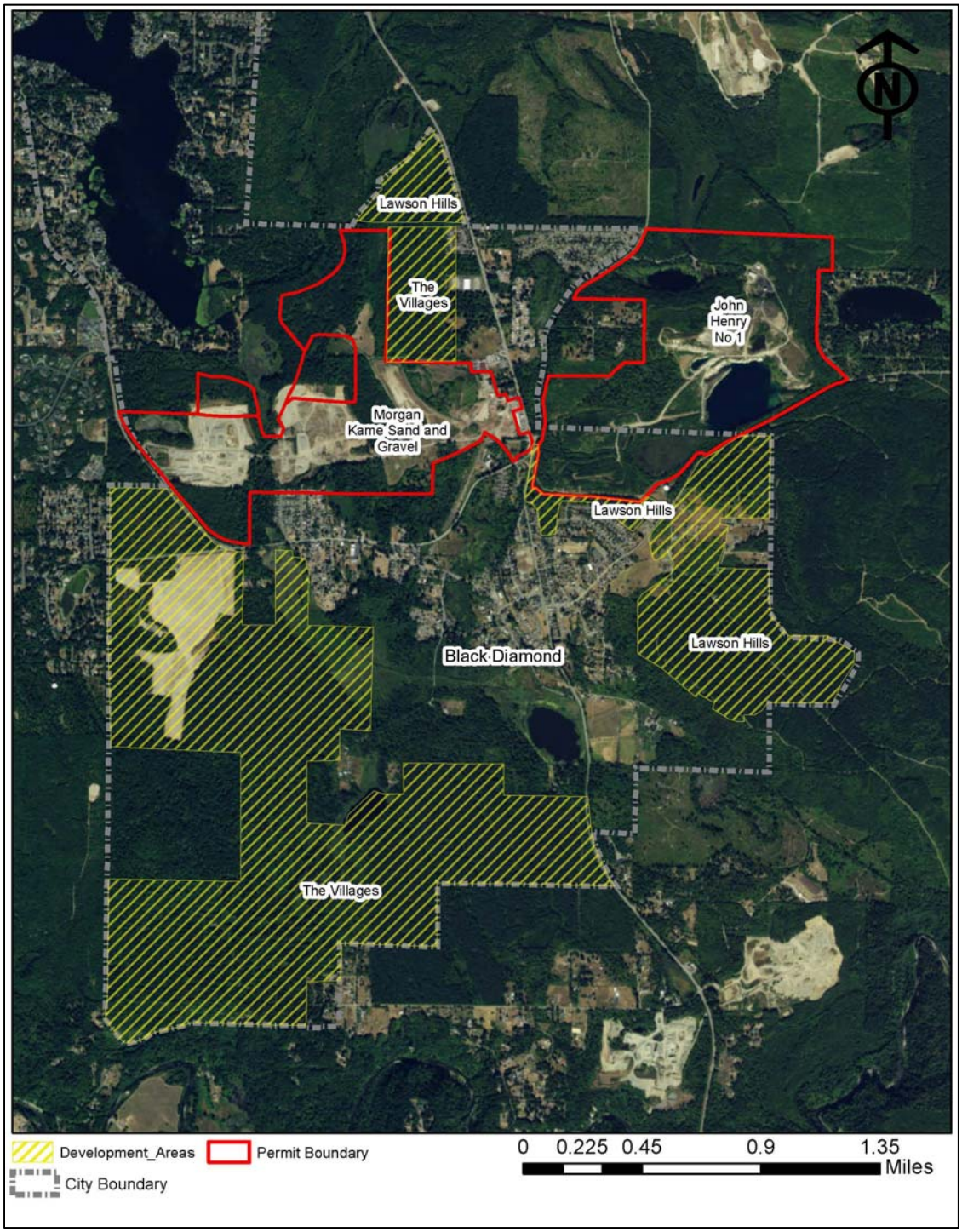
Cumulative impacts are those environmental impacts that could result from the implementation of the Proposed Action Alternative or the No Action Alternative, when added to the impacts from all other past, present, and reasonably foreseeable activities, regardless of who is conducting such activities. Figure 15 shows approximate locations for all past, current, and future projects analyzed in Section 4.1.

The scope of the cumulative impacts analysis is limited to those resources where the proposed action could have an additive impact in combination with other past, present, and reasonably foreseeable and similar future actions. Resource areas that would not result in an incremental impact to those identified in the direct and indirect impacts sections were not analyzed in cumulative impacts including: geology/paleontology, cultural resources, soils, topography, vegetation, noise and vibration, recreation, and human health and safety.

All GHG emissions contribute to cumulative climate change on a global scale. However, it is not scientifically possible to determine the impact that would result on the global climate conditions from the emissions from this specific proposed action or in total from the emissions of other actions. The variables involved in such an analysis would make this determination conjectural and not within the rule of reason.

For the hydrologic and wildlife resource areas, the geographic scope is focused upon the expanded watershed area through Lake Sawyer and into Covington Creek. Due to the discontinuous nature of groundwater occurrence in the John Henry No. 1 Mine permit area there would not be any anticipated cumulative impacts from past, present, or future projects therefore only potential cumulative impacts associated with surface water is carried forward for analysis (OSMRE 2014).

Figure 14. Cumulative Impacts Study Area



Based on the analysis presented in Chapter 3, *Affected Environment and Environmental Consequences*, the Proposed Action Alternative would affect the following resources and could contribute to an incremental cumulative impact:

- Surface Water
- Air Quality
- Vegetation
- Wetlands and Riparian Zones
- Fish and Wildlife
- Special Status Species
- Land Use
- Socioeconomics
- Transportation
- Visual
- Recreation

Past Actions. The primary existing (past) disturbances within the geographic area includes mining within the permit area from 1986 until 1999 and residential development within Black Diamond, including residential development around Lake Sawyer. Lake Sawyer was annexed into Black Diamond in 1998. The Morgan Kame sand and gravel operation is located in Black Diamond about a half mile west of the western permit boundary encompassing 220 acres. That operation, at its peak, produced over 400,000 tons per year, but is now operating at a reduced production level of less than 100,000 tons per year. The Cadman Black Diamond 293 acre sand and gravel mining and concrete manufacturing operation is located to the south of the John Henry No. 1 Mine along SE Green Valley Road. The Reserve Silica sand and gravel operation is located to the north of the John Henry No. 1 Mine along Black Diamond Ravensdale Road and is approximately 47 acres in size.

Present Actions. Present actions are focused on coal mining, sand and gravel mining, and residential development.

Reasonably Foreseeable Future Actions. Two large-scale residential developments within Black Diamond, the Villages and Lawson Hills MPDs, have the potential to contribute to cumulative impacts. Lawson Hills MPD is in closest proximity to the mine permit area and abuts it in places along the south and southeast borders. Initial land clearing for the first phase of this development of the Lawson Hills has not yet begun. Water lines and required traffic improvements have not yet been constructed. Initial housing development is expected in 2017 with 89 dwelling units. The developer expects to construct 83 dwelling units per year thereafter (Nelson 2014). Under the Proposed Action Alternative, PCCC is expected to complete mining in 2024. By 2024, approximately all units will have been constructed and occupied in the MPD's. Under the No Action Alternative, reclamation will be completed when the first houses are constructed. Ultimately, in the two MPD's, the developer expects to construct 6,050 dwelling units over 1,567 acres that includes 783 acres of open space while adding over 11,000 people to Black Diamond (Parametrix 2009a).

Another small scale residential development is the Reserve at Woodlands which would be a residential community consisting of 77 dwelling units over 394 acres located to the southwest of the John Henry No. 1 Mine. The developer is Oakpointe which is also one of the development partners for the Lawson Hills and Villages developments. Based on a County agreement with the developers of the Reserve at Woodlands, a regional stormwater facility would be constructed within the Reserve at Woodlands. The Reserve at Woodlands would not begin construction until after Lawson Hills and Villages developments have commenced (King County 2011). For the cumulative impact analysis the Villages, Lawson Hills, and Reserve at Woodlands developments are analyzed together due to their similar construction impacts and close proximity to one another (Stiles 2015).

In 2015, Maple Valley, which includes the City of Black Diamond, updated its Comprehensive Plan in conformance with the requirements of the Washington State GMA (RCW 36.70A). The Comprehensive Plan Update covers a period of 20 years and focuses on transportation, parks and recreation, public services and utilities, capital facilities, environmental quality, and economic development. The Plan outlines several proposed projects to continue to meet the needs of the growing population which are described below under the relevant resource (Maple Valley 2015).

Actions Eliminated from Further Study. Two coal export terminals proposed in Washington State were eliminated from further study: the Gateway Pacific Terminal in Cherry Point, Washington, and the Millennium Bulk Terminal in Longview, Washington. The Gateway Pacific Terminal EIS process was terminated on May 9, 2016 by the U.S. Army Corps of Engineers due to a determination of potential adverse impact on the Lummi Indian Nation's treaty fishing rights (WDOE 2016b). The Millennium Bulk Terminal released the Draft EIS on April 29, 2016 for public comment; however, due to high transportation costs and a low annual production it is not reasonably foreseeable that PCCC coal would be shipped out of this terminal (WDOE 2016c). For purposes of indirect impacts associated with air quality the Millennium Bulk Terminal is located outside of the indirect impact study area in Cowlitz County therefore causing no regional cumulative air quality impacts.

As described in Section 1.6, *Proposed Action Alternative*, PCCC has a contract in place for 60% of their annual coal production (50,400 tons per year) at the Lehigh Cement Plant in British Columbia and has previous consumers from past mining that could resume purchases once operations begin. If all existing contracts and previous customers did not purchase the coal, it is unlikely this coal would be exported to other customers because of low annual production rates and high transportation costs.

The Keta Creek Fish Hatchery is located approximately 7 miles southwest of the Proposed Action study area in Auburn, WA on Crisp Creek, a tributary of the Green River. It is owned and operated by the Muckleshoot Indian Tribe and the hatchery stock is Green River Fall Chinook. Potential impacts to the fish hatchery were not analyzed because as stated in Section 3.3,

Water Resources, there would be negligible impacts to the Green River and therefore no impacts to any tributaries (NOAA 2009). *Although both Crisp Creek and Rock Creek/Lake Sawyer both eventually drain into the Green River, they are in completely different and separate watersheds. Therefore, there is no possibility of impacts to the Keta Creek Fish Hatchery.*

4.1 Cumulative Impact Assessment

A cumulative impact assessment was conducted for the resource areas previously described in Chapter 3, *Affected Environment and Environmental Consequences*.

4.1.1 Surface Water

4.1.1.1 Historic John Henry No. 1 mining

As stated in Section 3.3.1, *Surface Water*, phosphorus and TSS levels have dropped since mining ceased in 1999. It's anticipated that phosphorus loading would increase from the Proposed Action Alternative, but not likely to the levels observed during the pre-1999 period of mining.

4.1.1.2 Historic Residential Development around Lake Sawyer

Potential sources of cumulative impacts to surface water associated with urban growth include: septic sewer systems, lawn fertilizers, and release of sediments during seasonal turnovers, other urban development, and native environment sources (aquatic plants and air). Cumulative phosphorus impacts from these sources and other urban development are not anticipated to change significantly now or in the near future and are assessed in the Lake Sawyer Management Plan and other reports produced by King County, WDOE and various agencies (King County SWM, 2000).

As a city with a population less than 100,000, all stormwater-related activities are regulated under the Black Diamond's Western Washington NPDES Phase II Permit (Phase II Permit). Among other requirements, the Phase II Permit requires the City of Black Diamond to have programs that directly address operation and maintenance of existing stormwater collection, treatment, and discharge systems; pollution prevention from sites of development, redevelopment, commercial, industrial, residential, and municipal activities; and an Illicit Discharge Detection and Elimination program to identify, isolate, and terminate illicit discharges to the City of Black Diamond's storm sewer. Therefore, any historic development that has occurred within the City of Black Diamond has been done in accordance with NPDES permitting standards and not resulted in a cumulative impact.

4.1.1.3 Sand and Gravel Mining

There are sand and gravel mining operations around the Black Diamond area which ultimately drain into Lake Sawyer. The Morgan Kame Sand Gravel Mine is located approximately a mile west of the permit boundary along Rock Creek just before it empties into Lake Sawyer. The sand and gravel mine represents a potential mining-related contribution of phosphorus to Lake

Sawyer and other surface water in the area. This operation is managed through a Sand and Gravel General NPDES Permit issued by WDOE which applies to it and other similar operations throughout the State. Since there is no data on phosphorus concentrations and flow related to discharge from the nearby sand and gravel operation, it is difficult to ascertain numerically how it could contribute to a cumulative impact to Lake Sawyer. However, turbidity is limited to a daily maximum of 50 nephelometric turbidity units (NTU) and total suspended solids is limited to a quarterly average of 25 mg/L which should reduce phosphorous loading to Lake Sawyer.

The Reserve Silica sand and gravel operation discharges into the Lake Sawyer watershed and falls under a Sand and Gravel General NPDES permit with the same specified limits on turbidity and total suspended solids as other operations in the watershed.

For site disturbances of more than 1 acre, or for sites smaller than 1 acre which are part of a larger common plan of development, a Construction Stormwater General NPDES Permit must be obtained from WDOE. The Construction Stormwater General Permit details specific actions the permittee must implement to prevent and mitigate water quality impacts due to construction activities. These would help limit cumulative impacts, which are expected to be negligible to minor and short term. Therefore, any constructed sand and gravel mining operations in the area are regulated under an NPDES permit reducing any potential cumulative impact.

4.1.1.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

The Villages is part of a proposed MPD for the Black Diamond area covering 1,190 acres, part of which lies within the Lake Sawyer watershed. Predicted total phosphorus concentrations in discharges from the Villages development to Rock Creek and Jones Lake are 0.038 mg/L and 0.053 mg/L, respectively (A.C. Kindig & Co, 2008). The Villages is currently in early phases of development, and the 150 acres currently disturbed is covered under WDOE's Construction Stormwater General NPDES Permit which sets specific limits to turbidity, which should decrease total phosphorus loading to Lake Sawyer. This NPDES permit is a general permit issued to numerous construction operations throughout the State of Washington. Specifically, it sets numerical limits for certain 303(d) listed waters (turbidity, fine sediment, or phosphorus) and specifies a numerical effluent limit of 25 NTUs, or alternatively no more than 5 NTUs over background turbidity when the background turbidity is 50 NTUs or less, or no more than a 10% increase in turbidity when the background turbidity is more than 50 NTUs. Because Lake Sawyer is 303(d) listed for phosphorus impairment, these standards apply here and should be effective in limiting phosphorus contributions from construction operations in this watershed.

The entirety of the 376 acre proposed Lawson Hills development lies within the Lake Sawyer watershed and mostly abuts the southern end of the John Henry No. 1 Mine permit boundary (A.C. Kindig & Co, 2008). Estimated post-treatment total phosphorus discharges from the Lawson Hills development varies between 0.036 and 0.051 mg/L depending on the subwatershed, with combined discharges to Rock Creek averaging 0.045mg/L.

The Reserve at Woodlands is assumed to have impacts similar to those presented for the Villages and Lawson Hills, but at a smaller scale due to the reduced number of dwelling units to be constructed (77 dwelling units for the Reserve at Woodlands versus 6,050 dwelling units for the Villages and Lawson Hills). Lawson Hills and the Reserve at Woodlands have yet to be constructed but are planned for the near future.

The MPDs would preserve natural hydrologic functions to a degree by designating certain lands within the developments as Open Space. Designated open space for the Lawson Hills MPD includes the area between Spoil Piles 3N and 3S and State Highway 169. Mining operations at John Henry No. 1 Mine are projected to be completed by 2024 when it is estimated that all dwellings within the MPD would be constructed and occupied.

In developing baseline data for the two MPD FEIS's, grab samples of water were taken during storm and baseflow events between December 2006 and April 2007. This measured an average phosphorus concentration of .021 mg/L (Parametrix 2009a). This "undeveloped" state compares to an average discharge from the John Henry No. 1 mine of less than 0.024 mg/L over the past 15 years at Discharge Point 002 and 0.025 mg/L at Discharge Point 001 which is expected to continue under the Proposed Action Alternative. *Therefore, cumulative impacts associated with other projects and the Proposed Action is expected to be minor and short term.*

4.1.1.5 Maple Valley Comprehensive Plan

The Maple Valley Comprehensive Plan includes measures to promote water conservation, protect the quality and quantity of public groundwater, mitigate discharges that pollute state waters, and protect water quality (Maple Valley 2015). The Proposed Action and No Action Alternative would adhere to all NPDES and SMCRA permit requirements thereby meeting all proposed water conservation efforts outlined by the Comprehensive Plan. Therefore, cumulative impacts associated with other projects and the Proposed Action is expected to be negligible and short term.

4.1.1.6 Other

Other potential cumulative impacts exist in the Lake Sawyer watershed from abandoned mines in the area. There are no anticipated impacts to other resources analyzed in cumulative impacts associated with the abandoned mine lands and Jones Lake therefore these are only analyzed in this section. The Lawson Hill Mine, located to the south of the John Henry No. 1 Mine, has a small permanent discharge from the main adit, which drains into Jones Lake and then into Rock Creek and Lake Sawyer. Although this location has higher specific conductivity than typical surface water of the area, total phosphorus only averaged 0.009 mg/L at this location based on data provided in the Lawson Hills MPD Water Quality Technical Report.

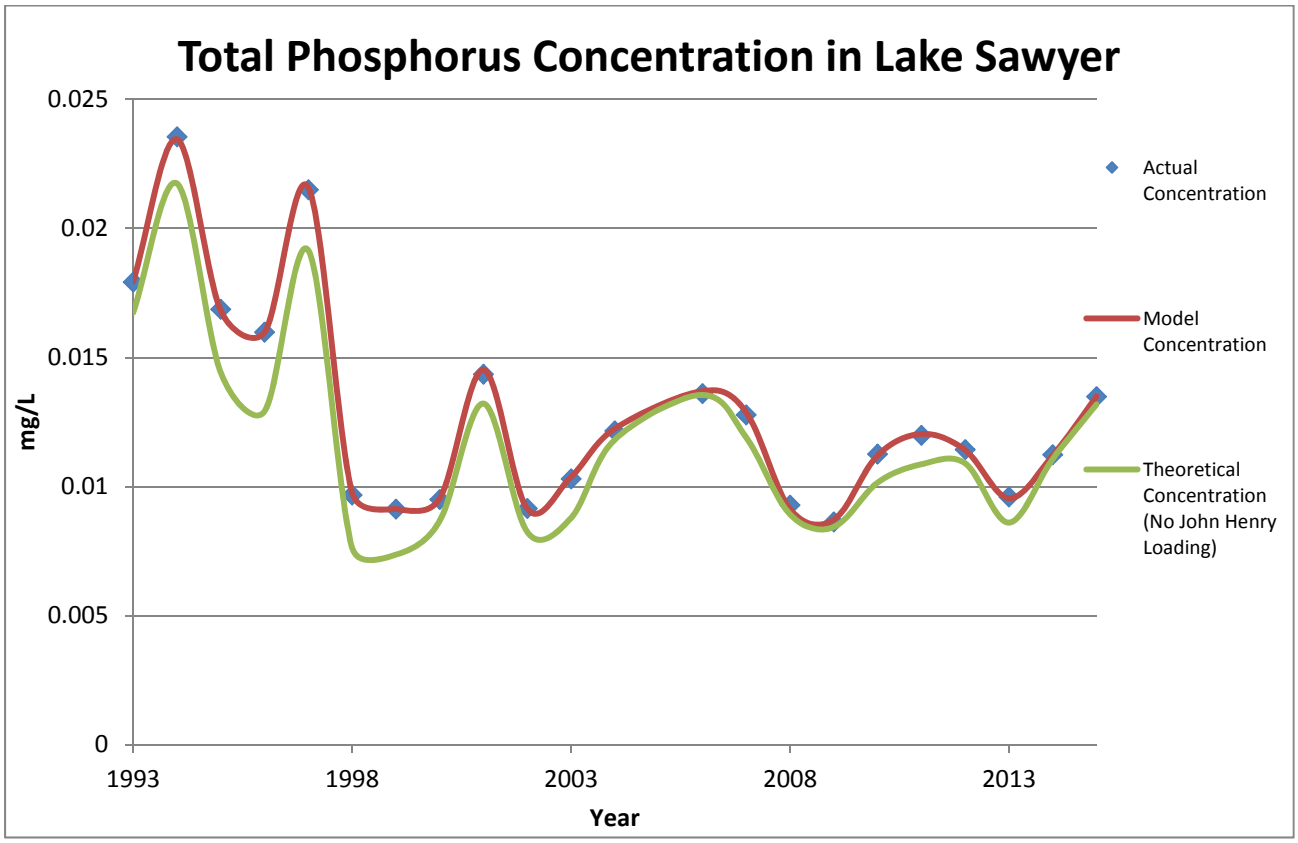
Jones Lake, located to the southeast of Lake Sawyer, is also a potential source of total phosphorus loading from re-suspension of phosphorus-laden sediment and other materials which have accumulated in the lake. Data collected by King County from April through October

2003 indicated that total phosphorus levels in the lake varied from 0.017 – 0.086 mg/L (A.C. Kindig & Co, 2008).

4.1.1.7 Summary

In summary, a water quality report and associated model drafted by King County Surface Water Management was released in 2000 which specified how much phosphorus can discharge into Lake Sawyer and still maintain the target steady state concentration of 16 µg/L. The assumptions from this model were utilized by OSMRE in the CHIA to approximate the impact of the John Henry No. 1 Mine on phosphorus loading in the watershed. Yearly average phosphorus loading rates were derived from the water monitoring data for discharges 001 and 002 and compared to in-lake yearly average phosphorus concentrations at 1 meter. Figure 16, based on the total phosphorus loading model from the CHIA, illustrates the yearly average phosphorus concentration in Lake Sawyer, marked by the red line, and the hypothetical concentration, without any discharge from the John Henry No. 1 Mine NPDES points, marked by the green line.

Figure 15. Phosphorus Loading TMDL Model



The primary conclusion drawn from the phosphorus-loading model is that a high natural variability associated with the phosphorus levels in Lake Sawyer exists. The total loading percentage from the mine operation has tended to be higher when the mine was active, and a lower rate of loading can be observed in the years from 2000 to 2015. Sufficient data was not available to calculate internal phosphorus loading from the lake itself and cumulative loading rates from other operations within the watershed.

The cumulative impact of phosphorus loading in Rock Creek *from human activity* is difficult to quantify specifically given the lack of loading data from all contributing operations and urban/suburban areas. However, given the water resource protection measures in place for each operation reviewed the long-term cumulative impacts on phosphorus levels in Lake Sawyer would be minor. In this case minor is defined as changes in water quality at Rock Creek where it enters Lake Sawyer that sometimes (0-33%) exceed background levels for total phosphorus. The potential increases in phosphorus expected from urban development through the MPD's must be mitigated in accordance with their MPD Agreements with the City of Black Diamond. Ultimately phosphorus loading in excess of permit standards will require the MPD developer to install phosphorus treatment facilities. As noted above, by the time the mining ceases operations in 2024, all residential units would be constructed and occupied at Lawson Hills MPD. Due to the MPD agreements with the City of Black Diamond, this makes it unlikely that there will be any cumulative impacts from the mine and the MPDs as reflected in water quality of Rock Creek as it enters Lake Sawyer.

Tetratech produced a final report on baseline (2011 – 2014) water quality monitoring within the Rock Creek watershed dated March 17, 2015 in support of the development of the two MPD's (Tetra Tech 2015). This report details information on the total phosphorus loading rates at three water monitoring sites within the Rock Creek watershed located at Abrams Road (upstream), Auburn-Black Diamond Road (midstream), and 312th Street (downstream adjacent to Lake Sawyer). The total annual average phosphorus loading at these three sites was reported at 201.69, 376.88, and 406.76 kg/year, respectively. This compares to an annual average loading rate of 51.5 kg/year total phosphorus from the John Henry No. 1 Mine. Discharges from the John Henry No. 1 Mine average 12.6 percent of the total phosphorus contributions in the Rock Creek watershed. For reference, the John Henry No. 1 Mine permit area comprises 10.8 percent of the Rock Creek watershed; one could conclude from this information that the mine is contributing phosphorus loading at a level typical of the Rock Creek watershed.

It was a conclusion of the CHIA that phosphorus loading into the Lake Sawyer increases slightly during time periods in which the John Henry No. 1 Mine is active. However, the differences in phosphorus loading between the No Action and Proposed Action Alternatives would be negligible given that the proposed action alternative adds 29.7 acres of total new disturbance. There would be a minor and long-term cumulative impact to phosphorus loading whether that

activity consists of reclamation-only or mining and reclamation given that the amount of reclamation work remaining to be conducted at the mine is much greater than the proposed new disturbance.

4.1.2 Air Quality

4.1.2.1 Historic John Henry No. 1 mining

Any previous mining of the John Henry No. 1 Mine would not result in cumulative air quality emissions since mining activities ceased in 1999. Air quality impacts associated with the Proposed Action Alternative is described in Section 3.5, *Air Quality*.

4.1.2.2 Historic Residential Development around Lake Sawyer

Since construction of these residences is complete there would be no construction emissions released and cumulative impacts would be limited to vehicle emissions from new residents. Cumulative impacts of these vehicles and the truck traffic under the Proposed Action Alternative would not result in a significant increase in area traffic and the residential traffic currently occurring was considered as part of the air quality analysis baseline using WDOE 2011 emission inventory data which covers the time when historical residential development would have occurred (*see* Section 3.5, *Air Quality*).

4.1.2.3 Sand and Gravel Mining

Air quality emissions related to sand and gravel mining would be restricted to the immediate area in and around the Morgan Kame sand and gravel mine and would primarily be associated with mining equipment and fugitive dust from mining, transportation, and storage. Cumulative impacts would be negligible and short-term because the Morgan Kame mine was operational during the last inventory data from WDOE in 2011 and therefore included as part of the air quality analysis baseline used to determine that direct and indirect impacts would be negligible.

4.1.2.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

The proposed MPD projects and the center of Black Diamond are both located to the south and west of the mining area. Sufficient data to perform the calculations *for potential cumulative impacts* was not provided *in the MPD proposals* (such as hours of operation, equipment type, etc) (City of Black Diamond 2011). *The Villages MPD includes information on modeled concentrations due to concerns over the increase in motor vehicle emissions related to their action as well as cumulative impacts from the Lawson Hills MPD; however, the model did not incorporate potential truck traffic related to the John Henry No. 1 Mine. As stated in the Villages MPD Final EIS, "Air quality dispersion modeling was used to calculate peak-hour CO concentrations at the most congested intersection using worst case meteorological conditions and other model inputs. The analysis is considered to be conservative and provide a worst case assessment." Cumulative modeled concentrations in 2025 range from 7.9 to 12.0 ppm CO for the 1-hour standard and 6.7 to 8.4 ppm CO for the 8-hour standard. Other criteria pollutants were not modeled.*

Based on the available information, it can be inferred that the effects of emissions from MPD activities in conjunction with those under the Proposed Action Alternative would be temporary and at any given time would occur only where operations are occurring. The effects of the

emissions on ambient air quality would vary with time due to the operational schedule, mobility of emission sources, type of equipment in use, and local meteorological conditions; therefore, they are not anticipated to lead to pollutant concentrations that would violate the NAAQS or impair regional air quality conditions and would be considered negligible and short-term. Indirect cumulative impacts from coal transportation and increased residential traffic would be considered moderate and short-term due to the increase of potentially 6,050 additional vehicles (assuming 1 vehicle per residential unit constructed); however, once mining operations cease by 2024 there would no longer be any impacts from coal transportation traffic.

4.1.2.5 Maple Valley Comprehensive Plan

Components of the Maple Valley Comprehensive Plan that would result in air quality emissions would include construction of roadway improvements along SR 169, additional utility services, upgraded community facilities, and various improvements and upgrades to area parks. These projects are expected to be small-scale construction operations (i.e. only utilizing 1 or 2 pieces of diesel or electric equipment) and short-term in duration (i.e. less than 3 months) therefore any emissions would be negligible.

4.1.2.6 Summary

In summary, cumulative impacts for air emissions would be minor and primarily be associated with the future development of the MPDs.

4.1.3 Fish and Wildlife

4.1.3.1 Historic John Henry No. 1 mining

Impacts of previous mining operations from 1986 – 1999 were analyzed in Section 3.10, *Fish and Wildlife*, Table 23.

4.1.3.2 Historic Residential Development around Lake Sawyer

Residential development around Lake Sawyer would have removed wildlife habitat and moved area species into adjacent lands. Since development around Lake Sawyer did not pick up until after mining operation had already begun it is presumed that species migrated into lands further from both Lake Sawyer and the Mine.

4.1.3.3 Sand and Gravel Mining

Table 23 presents wildlife data from the Morgan Kame sand and gravel mine. Other area mining operations would have removed wildlife habitat and forced species to migrate into adjacent lands with suitable habitats. It is presumed that species migrated into lands further from both sand and gravel mining operations and the John Henry No. 1 Mine.

4.1.3.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

Impacts on fish and wildlife have potential to be cumulative as land is cleared for the MPDs over the next fifteen years. The MPDs would mitigate these impacts by maintaining open space corridors that connect with surrounding undeveloped rural lands including the mine site (Parametrix 2009a). As noted in Section 3.7, *Vegetation*, under the Proposed Action Alternative, PCCC would disturb an additional 29.7 acres of land. The site would be planted with Douglas fir as part of reclamation activities. PCCC has also planted 123 acres of Douglas fir and maintains

162 acres of mixed deciduous forest within the permit area. This has provided extensive additional wildlife habitat. Given the 15-year time frame for MPD development and 5.5-year mine life the cumulative impacts would be negligible and could be positive as the mine site provides an area for elk, black bear, and black tailed deer to migrate into as the MPD's are developed. Under the No Action Alternative no additional wildlife habitat is disturbed although temporary habitat on the spoil piles will be removed and replaced as part of the reclamation plan. The land is reclaimed to forest and fish and wildlife habitat over one year under the Proposed Action Alternative and two years under the No Action Alternative. No negative cumulative impacts are expected.

4.1.3.5 Maple Valley Comprehensive Plan

The Maple Valley Comprehensive Plan includes a section on Plants and Animals under the Environmental Quality element. The section outlines several mitigation measures for future urbanization such as residential and commercial design standards, vegetative protection requirements, land use, and zoning restrictions, critical area regulations, incentives for open space and stream corridor preservation and revegetation projects, and public education and involvement programs (Maple Valley 2015). Two designated wildlife corridors have been established and are maintained by the city of Maple Valley.

4.1.3.6 Summary

In summary, potential cumulative impacts to fish and wildlife would be minor and short-term. Impacts associated with increased development such as the MPDs resulting in loss of habitat would be minor and short-term since the Mine would be reclaimed after six years under the Proposed Action Alternative providing suitable habitat once vegetation is re-established.

4.1.4 Vegetation

4.1.4.1 Historic John Henry No. 1 mining

Impacts of previous mining operations from 1986 – 1999 were analyzed in Section 3.8, Vegetation.

4.1.4.2 Historic Residential Development around Lake Sawyer

Residential development around Lake Sawyer would have removed vegetation through disturbance. Continued urbanization would include a process of habitat alteration that changes the characteristics of the plant communities and the habitat for wildlife.

4.1.4.3 Sand and Gravel Mining

Other area mining operations would have removed wildlife habitat through vegetation. Slopes would be reforested and the valley floor would be revegetated with grasses.

4.1.4.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

Additional mining under the Proposed Action Alternative would impact vegetation within the permit boundary. Mining under the Proposed Action Alternative would add to the past and present actions, and reasonably foreseeable future actions within the SMCRA permit boundary.

This would result in minor contributions to cumulative impacts due to the removal of forested areas for mining and the eventual return to reclaimed forest habitat. As noted in Section 3.7, *Vegetation*, under the Proposed Action Alternative, PCCC would disturb an additional 29.7 acres of land. The site would be planted with Douglas fir as part of the reclamation activities. PCCC has also planted 123 acres of Douglas fir and maintains 162 acres of mixed deciduous forest within the permit area. Under the No Action Alternative no additional vegetation would be disturbed; although, temporary vegetation on the spoil piles would be removed and replaced as part of the reclamation plan. No negative cumulative impacts are expected.

4.1.4.5 Maple Valley Comprehensive Plan

The Maple Valley Comprehensive Plan includes a section on Plants under the Environmental Quality element. The section outlines several mitigation measures for future urbanization such as residential and commercial design standards, vegetative protection requirements, land use, and zoning restrictions, critical area regulations, incentives for open space and stream corridor preservation and revegetation projects, and public education and involvement programs (Maple Valley 2015). Ground-disturbance type projects require consultation with the City in order to reduce the cumulative impacts on natural resources.

4.1.4.6 Summary

In summary, potential cumulative impacts to vegetation resources would be minor and short-term. The overall contribution to cumulative impacts to vegetation under the Proposed Action Alternative would be minor due to the localized effects and the improved productivity on mined lands that become reclaimed. Impacts associated with increased development such as the MPDs resulting in loss of forested areas would be minor and short-term since the Mine would be reclaimed after seven years under the Proposed Action Alternative providing suitable forest habitat once vegetation is complete.

4.1.5 Wetlands and Riparian Zones

4.1.5.1 Historic John Henry No. 1 mining

Impacts of previous mining operations from 1986 – 1999 were analyzed in Section 3.9, Wetlands and Riparian Zones.

4.1.5.2 Historic Residential Development around Lake Sawyer

Habitat potentially affected is consistent with the definition of EFH and is protected by federal law against significant adverse effects.

4.1.5.3 Sand and Gravel Mining

Habitat potentially affected is consistent with the definition of EFH and is protected by federal law against significant adverse effects. The only species with EFH habitat designation within the project area is Coho salmon and no direct impact to any fish-bearing creek is expected. The Morgan Kame gravel mine included riparian and wetland management buffers meeting current City of Black Diamond Sensitive Areas Ordinance requirements. City requirements include: a 225-foot buffer measured from the ordinary high water mark of Rock Creek as required by

BDMC 19.10.325.C; a 225-foot buffer measured from the edge of the Frog Lake wetland complex as required by BDMC 19.10.230.B; the existing wider buffers would be enhanced through planting of the additional area beyond the current buffer; the expansion area wider buffers would be set aside for permanent protection (Black Diamond 2009c).

4.1.5.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

The residential developments would be constructed in clusters to minimize impacts to environmentally sensitive areas including wetlands. Also, the proposed stormwater control systems would maintain wetland recharge for wetlands located on the property in order to protect wetland hydrology and function, therefore reducing any cumulative impacts (Parametrix 2009a).

4.1.5.5 Maple Valley Comprehensive Plan

Both the Cedar and Green Rivers, and their tributaries, contain Chinook, Coho, and Sockeye Salmon. The NMFS has listed several of these species as threatened or endangered under the Endangered Species Act. Lake Wilderness is managed for trout. Large and small mouth bass are also found in Lake Lucerne and Pipe Lake (Maple Valley 2015). Mitigation measures such as: residential and commercial design standards, vegetative protection requirements, land use, and zoning restrictions, critical area regulations, incentives for open space and stream corridor preservation and revegetation projects, and public education and involvement programs are implemented by City of Maple Valley.

4.1.5.6 Summary

Wetlands would be disturbed by mining and reclamation activities that eliminate non-jurisdictional wetlands in either the long-term (life of the project) or the short-term (temporary, up to seven years). The primary cumulative impacts to wetlands would be from elimination of 2.58 acres of wetlands as a result of the continued mining of coal at the John Henry No. 1 mine. However, these wetlands would be reclaimed to lowland forest and there would be no cumulative impacts to other streams and riparian zones within the permit boundary.

4.1.6 Special Status Species

4.1.6.1 Historic John Henry No. 1 mining

Impacts of previous mining operations from 1986 – 1999 were analyzed in Section 3.10.1.5, Special Status Species.

4.1.6.2 Historic Residential Development around Lake Sawyer

Residential development around Lake Sawyer would have removed wildlife habitat and moved area species into adjacent lands. Since development around Lake Sawyer did not pick up until after mining operation had already begun it is presumed that species migrated into lands further from both Lake Sawyer and the Mine. Lake Sawyer is considered aquatic priority habitat and continues to have regular concentrations of waterfowl and/or raptors, including the American white pelican and Bald eagle. Previous residential development around Lake Sawyer has

historically occurred in approved zoning areas for residential or industrial development, and therefore would not result in reduced critical habitat special status species.

4.1.6.3 Sand and Gravel Mining

Table 23 presents wildlife data from the Morgan Kame sand and gravel mine. Other area mining operations would have removed wildlife habitat and forced species to migrate into adjacent lands with suitable habitats. It is presumed that species migrated into lands further from both sand and gravel mining operations and the John Henry No. 1 Mine.

4.1.6.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

Impacts on fish and wildlife have potential to be cumulative as land is cleared for the MPDs over the next fifteen years. The MPDs would mitigate these impacts by maintaining open space corridors that connect with surrounding undeveloped rural lands including the mine site (Parametrix 2009a). As noted in Section 3.7, *Vegetation*, under the Proposed Action Alternative, PCCC would disturb an additional 29.7 acres of land. The site would be planted with Douglas fir as part of reclamation activities. This has provided extensive additional wildlife habitat. Given the 15-year time frame for MPD development and seven year duration of the Proposed Action Alternative, the cumulative impacts would be negligible and could be positive as the mine site provides an area for elk, black bear and black tailed deer to migrate into as the MPD's are developed. Under the No Action Alternative no additional wildlife habitat is disturbed although temporary habitat on the spoil piles will be removed and replaced as part of the reclamation plan. The land is reclaimed to forest and fish and wildlife habitat under the Proposed Action Alternative and two years under the No Action Alternative. No negative cumulative impacts are expected.

4.1.6.5 Maple Valley Comprehensive Plan

Both the Cedar and Green Rivers, and their tributaries, contain Chinook, Coho, and Sockeye Salmon. The NMFS has listed several of these species as threatened or endangered under the Endangered Species Act. Mitigation measures for future vegetative protection requirements, land use and zoning restrictions, critical area regulations, incentives for open space and stream corridor preservation, and revegetation projects have been implemented by the City (Maple Valley 2015).

4.1.6.6 Summary

In summary, potential cumulative impacts to special status species would be minor and short-term. Impacts associated with increased development such as the MPDs resulting in loss of habitat would be minor and short-term since the Mine would be reclaimed after seven years under the Proposed Action Alternative providing suitable habitat once vegetation is re-established. The determination for bull trout would remain the same as analyzed in 2001 - not likely to adversely affect. Since 2001, the bald eagle has been de-listed and therefore is no longer subject to an ESA section 7 analysis. There would be minimal cumulative effects for the Whitebark pine, North American wolverine, Marble-murrelet, Oregon spotted frog, Yellow-billed cuckoo, or the Streaked-horned lark. A determination of "may affect, not likely to adversely affect" for the Puget Sound Chinook salmon, and designated critical habitat has been made by

OSMRE. *Letters of consultation with the National Marine Fisheries Service (NMFS) and USFWS are provided in Appendix C, Consultation.*

4.1.7 Land Use

4.1.7.1 Historic John Henry No. 1 mining

Before mining began at the John Henry No. 1 Mine the area was designated as unmanaged forest for the upland area and fish and wildlife habitat for the Mud Lake and Ginder Lake wetlands (OSMRE 1985). The land use since 1986 has been mining with the continued associated use of wildlife habitat in undisturbed areas with some forest land reestablished in the reclaimed area of the mine. The Proposed Action and No Action Alternatives would reclaim the land to forest and fish and wildlife habitat.

4.1.7.2 Historic Residential Development around Lake Sawyer

Land use changes associated with the previous residential development around Lake Sawyer, occurred in approved zoning areas for residential or industrial development, and therefore would not result in reduced open space or removal of critical habitat.

4.1.7.3 Sand and Gravel Mining

Sand and gravel mining in the area has disturbed approximately 560 acres, primarily coniferous forest. Similar to the John Henry No. 1 Mine the mining areas will be reclaimed to be consistent with a forestry and uncategorized, cleared land use designation upon completion.

4.1.7.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

The proposed residential development for the Villages and Lawson Hills would convert 783 acres of open space to residential development when all 6,050 dwelling units are built. At a total of 1,158 acres, each dwelling unit would be built on approximately 0.25 acres. The open space to residential acreage ratio is approximately 1:2. So for every 2 acres of disturbed land one of those is an open space acre. This means that by 2024, of the 1,158 acres disturbed approximately 579 of those acres would be converted from open space to residential property. The Reserve at Woodlands is already zoned for residential development and therefore would not result in a loss of open space. Reclaimed land under both the Proposed Action Alternative and the No Action Alternative would be forest and fish and wildlife habitat. This positive impact would provide additional open space in proximity to the MPD's thereby replacing some fish and wildlife habitat lost due to residential construction. Also, as part of the MPDs proposal development agreements were established with the City and outline fish and wildlife buffers and open space boundaries to help maintain existing and future parks and open spaces.

4.1.7.5 Maple Valley Comprehensive Plan

The Maple Valley Comprehensive Plan describes several small scale upgrades to area parks including the Lake Wilderness Park near the City of Maple Valley. The Plan also describes one new park facility to be named Summit Park located west of Maple Valley Black Diamond Road SE (SR 169), south of Kent-Kangley Road, and north of SE 276th Street. This park falls outside of City limits; therefore, it would not convert any existing land designations surrounding the mine. However, residents of Black Diamond could use its facilities and benefit from having it

close by. The Plan goes on to describe the King County incentives to preserve open space on private property such as tax reductions and the Community Stewardship Grants (Maple Valley 2015).

4.1.7.6 Summary

In summary, land use changes associated with the John Henry No. 1 Mine occurred in approved zoning areas for residential or industrial development and therefore would not result in reduced open space or removal of critical habitat. The greatest land use impacts would result from the proposed residential developments; however, these would be phased developments and by the time the Proposed Action and No Action Alternatives the mine itself would be reclaimed into forest and fish and wildlife habitat therefore, cumulative impacts related to land use are minor and long-term.

4.1.8 Socioeconomics and Environmental Justice

4.1.8.1 Historic John Henry No. 1 mining

Since previous mine operations ceased in 1999 the John Henry No. 1 Mine no longer provides area employment until the Proposed Action Alternative or No Action Alternative is approved.

4.1.8.2 Historic Residential Development around Lake Sawyer

Since these homes have already been constructed there would be no construction related jobs. The increase in area population from occupancy of these households would contribute to the City of Black Diamond and King County taxes; however, those increases would be considered minor.

4.1.8.3 Sand and Gravel Mining

The Morgan Kame sand and gravel mine employees between 12 – 24 people at any given time and varies based on the current production level (Black Diamond 2009c). The workforce for the Cadman Black Diamond and the Reserve Silica sand and gravel operation is unknown but conservatively assumed to be similar to that of the Morgan Kame Mine. There are no anticipated changes to employment at the sand and gravel mines operating in the area and therefore no cumulative impacts.

4.1.8.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

The population within the City of Black Diamond is expected to show more rapid growth over the next 25 years as the two MPDs are completed. The socioeconomic and environmental impacts for the Villages and Lawson Hills MPD are calculated and discussed in separate EISs (Parametrix 2009a and 2009b). Construction employment associated with building over 6,050 new residential units and substantial new commercial units in Black Diamond over the next 15 years dwarfs the projected 30 employees needed under the Proposed Action Alternative over six years for mining operations and 20 employees for one year for reclamation and 20 employees over two years for reclamation under the No Action Alternative (Parametrix 2009a). No discernible cumulative impacts are expected except for the positive short-term impact of local employment.

4.1.8.5 Maple Valley Comprehensive Plan

Minor construction projects outlined in the Maple Valley Comprehensive Plan would add short-term, temporary employment to area residents. The majority of economic development described in the Plan related to the development of the MPDs within the City of Black Diamond as described in Section 4.1.6.4, *Villages, Lawson Hills, and Reserve at Woodlands Residential Developments*. One project that would improve the City of Black Diamond's existing utilities is for the installation of a new high-pressure natural gas supply main in the south end of Maple Valley near Auburn-Black Diamond Road and 224th Avenue SE to accommodate future growth associated with the proposed MPDs thereby reducing any strain on utilities to existing residents (Maple Valley 2015).

4.1.8.6 Summary

In summary, there would be no disproportionately high and adverse impacts on minority and low-income populations as described in Section 3.11.2, *Environmental Justice*, therefore there would be no cumulative impacts. Cumulative impacts to socioeconomic resources would be negligible and short-term due to the seven-year duration of the Proposed Action Alternative and two years of reclamation under the No Action Alternative.

4.1.9 Transportation

4.1.9.1 Historic John Henry No. 1 mining

Previous mining at the John Henry No. 1 Mine has ceased and therefore there would not be any associated truck traffic from vendors, employees, or coal transport.

4.1.9.2 Historic Residential Development around Lake Sawyer

Residential development around Lake Sawyer would have resulted in an increase in vehicle traffic however this increase in traffic was included as part of the baseline traffic analyzed along with the Proposed Action Alternative in Section 3.12, *Transportation*.

4.1.9.3 Sand and Gravel Mining

Truck trips from the Morgan Kame sand and gravel mine have historically ranged and are expected to continue to range from between 120 to 340 truck trips per day during the construction season from April through October (Black Diamond 2009c). The daily truck trips for the Cadman Black Diamond and the Reserve Silica sand and gravel operation is unknown but conservatively assumed to be similar to that of the Morgan Kame Mine (for a total of approximately 360 to 1,020 trucks per day from all sand and gravel operations) (Black Diamond 2009c). The cumulative impact of adding an average of ten (9.9) additional trucks to the traffic (or even 82 truck trips per day under the most *active* barge loading conditions) from the John Henry No. 1 Mine would be minor *and short term*. This is especially the case because King County prohibits truck traffic from the mine site during peak traffic hours.

4.1.9.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

The two MPD's would eventually add significant additional traffic that will be mitigated through traffic improvements to maintain required LOS at major intersections (Parametrix 2009c). *As stated in the Villages MPD, "The transportation analysis indicates the need for improvements at*

28 intersections, and the completion of the 2025 transportation network as proposed in the City's Comprehensive Plan. These roadways will provide for sufficient circulation and will meet the level of service standards set forth by the City." Table XX below presents those recommended mitigation measures described in the Villages MPD (Parametrix 2009c).

Table XX. Villages MPD Transportation Mitigation Measures

Study Intersection	Alternative 1	Alternative 2
SE 288th Street/216th Avenue SE	Signalize.	Signalize.
SR 169/SE 288th Street	Signalize.	Signalize. Add NBL turn pocket.
SE Covington Sawyer Road/ 216th Avenue SE	Add NBL turn pocket.	Add EBL, NBL, SBL, and SBR turn pockets.
SE Auburn Black Diamond Road/ 218th Avenue SE	NA	Provide a refuge on EB approach for NBL turning vehicles.
SE Auburn Black Diamond Road/ Morgan Street	Provide a refuge on EB approach for NBL turning vehicles.	Provide a 100-foot refuge on EB approach for NBL turning vehicles.
SR 169/Roberts Drive	NA	Add SBL, SBR, NBL, and EBL turn pockets.
SR 169/SE Black Diamond Ravensdale Road (Pipeline Road)	Add SBR turn pocket.	Add SBR and WBL turn pockets.
SR 169/Baker Street	Add EBL turn pocket.	Add EBR and SBR turn pockets.
SR 169/Jones Lake Road (SE Loop Connector)	Signalize.	Signalize.
SR 169/SE 240th Street SR 169/Witte Road SR 169/SE Wax Road SR 169/SE 231st Street SR 169/SR 18 EB Ramps	Add third SB lane from Wax Road to Witte Road ending it as a right-only lane at Witte Road.	Add additional SBT lane on SR 169 from north of 231st Street to Witte Road. Add second shared NBTR lane at SR 169/240th Street.
SR 516/SE Wax Road	Add second SBL turn pocket.	Add second SBL and WBR turn pockets.
SR 516/168th Place SE	NA	Add NBL and EBR turn pockets.
SE 272nd Street/160th Avenue SE	Add SBR turn pocket. Provide a 100-foot refuge on WB approach for SBL turning vehicles.	Add SBR turn pocket. Provide a 100-foot refuge on WB approach for SBL turning vehicles.
SE Kent Kangley Road/ Landsburg Road SE	Add a SBL turn pocket.	Add SBL turn pocket and provide a refuge on WB approach for SBL turning vehicles.
SR 169/SE Green Valley Road	Provide a refuge on SB approach for EBL turning vehicles.	Add EBL turn pocket and provide a refuge on SB approach for EBL turning vehicles.
SE Auburn-Black Diamond Road/ SE Green Valley Road	Provide a refuge on EB approach for NBL turning vehicles.	Provide a refuge on EB approach for NBL turning vehicles.
SR 169/North Connector	Signalize. Add NBL and SBR turn pockets.	Signalize. Add NBL and EBR turn pockets.
Lake Sawyer Road/Pipeline Road	NA	Signalize. Add EBL, NBL, SBR turn pockets.
SE Auburn Black Road/ Annexation Road	Signalize.	Signalize. Add EBL, EBR, WBL, WBR, NBL and SBR turn pockets.
SR 169/South Connector	Add EBR turn pocket. Provide refuge on SB approach for EBL turning vehicles.	Signalize. Add NBL and SBR turn pockets.

According to the City of Black Diamond's 6-year Transportation Improvement Plan, improvements would include a new arterial roadway, road extensions, and intersection improvements including Ravensdale/SR 169, as well as safety upgrades and maintenance (City of Black Diamond 2016). By the time the mining ceases operations in 2024, it is expected that all units would be constructed and occupied. The cumulative traffic with the MPD's impacts will be moderate and short-term due to the planned mitigation measures committed to by the MPD

Agreements with the City of Black Diamond and the short duration of the Proposed Action Alternative.

4.1.9.5 Maple Valley Comprehensive Plan

The Maple Valley Comprehensive Plan outlines three potentially funded roadway improvement projects on roads that would be used to haul coal from the John Henry No. 1 Mine. The Plan states that along SR 516 from 160th Avenue SE to 164th Avenue SE turn lanes would be added and traffic signals modified to accommodate growing traffic levels. Along SR 169 between 222th and 244th and Witte and SE 240th the roadway would be widened beginning in 2017 and ending in 2019. These planned improvements would allow for the City of Black Diamond to accommodate future traffic growth scenarios associated with the coal hauling, sand and gravel mine operations, and MPD developments (Maple Valley 2015).

4.1.9.6 Summary

In summary, there would be minor, short-term cumulative impacts from area projects and the Proposed Action and No Action Alternatives. Incremental traffic increases would be projected to be minor with a maximum of 368 (MPD new residences and Proposed Action Alternative employment) vehicles added to area roadways. Potential roadway improvements could assist with these growing numbers on SR 516 and 169. Traffic increases under the No Action Alternative would be less than 360 vehicles per day. It is expected that current roadways within King County would be equipped to handle this increase.

4.1.10 Visual

4.1.10.1 Historic John Henry No. 1 mining

Previous land clearing and grading associated with activities at the John Henry No. 1 Mine occurred between 1986 and 1999. This area as well as the 29.7 acres of disturbance encompass the mine permit boundary and would result in a minor visual cumulative impact similar to that described in Section 3.15, *Visual Resources*, for the Proposed Action Alternative. This area would be reclaimed land under both the Proposed Action Alternative and the No Action Alternative.

4.1.10.2 Historic Residential Development around Lake Sawyer

Previous land clearing and construction of new structures associated with the development of new residences around Lake Sawyer are completed and resulted in a change to the visual landscape. The increase in residences around Lake Sawyer would result in an increase in those impacted by changes to visual resources under the Proposed Action Alternative and were taken into account in Section 3.15, *Visual Resources*.

4.1.10.3 Sand and Gravel Mining

The sand and gravel mining encompasses 560 acres of land disturbance and mining activities. There are no additional mining activities or expansions planned therefore visual impacts related to sand and gravel mining would remain the same and not result in cumulative impacts.

4.1.10.4 Villages, Lawson Hills, and Reserve at Woodlands Residential Developments

Reclaimed land under both the Proposed Action Alternative and the No Action Alternative would be forest and fish and wildlife habitat. This positive impact would provide additional open space and improve aesthetics of the community in proximity to the MPD's thereby replacing some fish and wildlife habitat lost due to residential construction.

4.1.10.5 Maple Valley Comprehensive Plan

Components of the Maple Valley Comprehensive Plan would result in temporary and minor impacts to visual resources from small-scale construction and improvement projects (Maple Valley 2015). Most of the potential visual impacts would occur outside of the city limits and therefore not cause a cumulative effect with the Proposed Action Alternative.

4.1.10.6 Summary

In summary, no cumulative impacts are expected except for a short period while Spoil Pile 3S is reclaimed under the Proposed Action and No Action Alternatives. Those impacts would be minor and short-term. This is because the change to the visual appearance of the site during mining and reclamation activities will generally be noticeable but subtle. Potential visual impacts would usually be subordinate, but may be noticed by viewers without being pointed out.

5.0 PERSONS / AGENCIES CONTACTED

5.1 OSMRE Western Region Interdisciplinary Review

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5.2 Pacific Coast Coal Company

David Morris, General Manager
Mike Conaboy, Environmental Coordinator
William Kombol, Manager, Palmer Coking Coal Company

5.3 Interagency Consultation

U.S. Department of Labor, Mine Safety and Health Administration
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers
Washington Department of Ecology
City of Black Diamond
King County Department of Development and Environmental Services
Washington Department of Archeology and Historic Preservation
Washington Department of Natural Resources, Division of Geology and Earth Sciences
Washington Department of Fish and Wildlife

5.4 Tribal Contacts

Muckleshoot Indian Tribe
Confederated Tribes of the Warm Springs Reservation of Oregon
Puyallup Tribe of the Puyallup Reservation
Snoqualmie Indian Tribe
Stillaguamish Tribe of Indians of Washington
Confederated Tribes and Bands of the Yakama Nation
Suquamish Indian Tribe of the Port Madison Reservation

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