

4.3 NEEDS AND WELFARE OF THE PEOPLE—SOCIOECONOMICS

This section addresses the direct, indirect, and cumulative effects of the No Action Alternative and action alternatives on the regional and state economy, education and infrastructure, cost of living, and population characteristics. Potential direct, indirect, and cumulative effects on commercial fishing and recreational tourism are discussed in Section 4.6, Commercial and Recreational Fisheries. While subsistence activities are an indispensable component of the socioeconomic system of rural Alaska communities, this section addresses the monetized economy. Subsistence activity and the importance of subsistence as it relates to income and its support in stabilizing communities during economic downtimes are discussed in Section 4.9, Subsistence. Potential impacts to the socioeconomic environment include changes to economy and income, regional education and infrastructure, cost of living, and population. In addition, cultural ties to the area can impact the socioeconomic welfare of a community. The sociocultural dimensions are discussed in Section 4.9, Subsistence and Section 4.7, Cultural Resources.

The Environmental Impact Statement (EIS) analysis area for this section includes the state of Alaska, regions, and communities where aspects of the monetized economy (including population, employment and income, government revenue, housing, and education) would be impacted by the construction, operations, and closure of all components of each alternative of the proposed project. Relevant effects on the state of Alaska are also discussed. The boroughs and communities included in the EIS analysis area for the socioeconomic analysis are:

- Lake and Peninsula Borough
 - Igiugig
 - Iliamna
 - Kokhanok
 - Levelock
 - Newhalen
 - Nondalton
 - Pedro Bay
 - Port Alsworth
- Dillingham Census Area
 - Dillingham
 - Ekwok
 - Koliganek
 - New Stuyahok
- Kenai Peninsula Borough
- Bristol Bay Borough
- Anchorage
- Alaska

Scoping comments related to socioeconomics focused on beneficial impacts of additional employment opportunities, adverse economic impacts to recreation and commercial fisheries, impacts on the use of Iliamna Lake for sport fishing and recreation, impacts on the bear viewing industry near the Amakdedori port, economic benefits to the state of Alaska, and how risks to the environment could outweigh short-term benefits. The following sections assess potential impact to these and other issues.

The magnitude of impact is discussed in terms of communities impacted or monetary implications (e.g., employment/income, potential revenue generated/lost, cost of living); the duration and geographic extent of impacts depends on the location and season in which the disturbance occurs during construction, operations, or closure; and the potential of impacts is how likely the impact would be.

Mitigation measures and actions designated to reduce or eliminate project impacts on socioeconomics are provided in Chapter 5, Mitigation.

4.3.1 No Action Alternative

Under the No Action Alternative, the project would not be undertaken. No construction, operations, or closure activities would occur. Although no resource development would occur under the No Action Alternative, permitted resource exploration activities currently associated with the project may continue (ADNR 2018-RFI 073). The Pebble Limited Partnership (PLP) would retain the ability to apply for continued mineral exploration activities under the State's authorization process, as well as any activity that would not require federal authorization. In addition, there are many valid mining claims in the area and these lands would remain open to mineral entry and exploration by other entities. Therefore, while there may be some decrease in the current level of economic activity generated by exploration of the project, exploration could continue, no changes in additional future direct or indirect effects to existing socioeconomics would be expected, and existing trends would continue.

4.3.1.1 Regional Setting

Regional Economy

The PLP employed around 100 and 150 local community members annually at the site during the pre-development phase of the project, which ended in 2012 (Loeffler and Schmidt 2017). Since then, PLP has had a minimal number of workers at the site for exploration and maintenance activities. Under the No Action Alternative, it is anticipated that PLP would continue current activities in an effort to identify future opportunities. As a result, the current number of direct and indirect jobs would remain roughly the same and there would be no impact to the regional economy.

Cost of Living

The No Action Alternative is not anticipated to result in changes to the current activities or infrastructure associated with the Pebble deposit or regional infrastructure. As a result, the No Action Alternative would have no effect on the cost of living in the potentially affected communities.

Regional Infrastructure

No impacts to the regional infrastructure would be anticipated as a result of the No Action Alternative. Because of the remoteness and small workforce, pre-development work has had little impact on the regional public infrastructure. The No Action Alternative would not affect the current or projected infrastructure, including education, health services, water, transportation, sewer, and solid waste operations.

4.3.1.2 Potentially Affected Communities

Since it is anticipated that PLP would continue current activities in an effort to identify future opportunities under the No Action Alternative, the current number of direct and indirect jobs would not be expected to change. Under the No Action Alternative, population trends in communities would continue. Declining populations in some communities can lead to school closures and other loss of services.

4.3.2 Alternative 1 – Applicant’s Proposed Alternative

4.3.2.1 Regional Setting

Regional Economy

Loeffler and Schmidt (2017) found that during the pre-development phase of the project (2009 to 2012), community members from the region accounted for about 43 percent of the project’s seasonal workforce. Since then, PLP has had a minimal number of workers at the site for exploration and maintenance activities. Under Alternative 1, the magnitude of the project’s impact on local employment would be an increase of 2,000 direct hire project employees during the construction phase, and 850 during the operations phase. The duration of these impacts would be short-term for construction employees, and long-term for operations. PLP has stated that its objective is to maximize opportunities for local hire; first, directly to residents of the EIS analysis area, or those with close ties to the area; and then to Alaska residents in general. It is estimated that during operations, 250 employees would come from surrounding communities, and the remaining 600 would be flown to the project area from Anchorage or Kenai. However, it is likely that during the construction phase, non-Alaskan labor would be required to fill the anticipated 2,000 jobs, potentially as high as 50 percent of hires (PLP 2018-RFI 027). Therefore, the geographical extent could extend from local communities to the state of Alaska, and beyond. In addition, indirect employment would increase from the services that would be needed to support construction and operation activities (e.g., air services, goods, and supplies). These activities could potentially create a large number of direct and indirect jobs in the region, relative to the population providing a measureable beneficial impact over both the short-term construction phase and long-term life of the project. These impacts would be certain to occur if the project is permitted and built.

Alternative 1 would provide year-round operations employment, which would help reduce the impacts of the seasonal fluctuations in employment that are prevalent in the region. Depending on the construction schedule and nature of activities, some construction employment while beneficial to the local economy may be short-term and seasonal in nature and/or limited in duration.

Loeffler and Schmidt (2017) also found during the pre-development phase that communities near the mine site provided a much higher percentage of local labor than more distant communities, such as those in the Dillingham Census Area or other coastal communities. In addition, opportunities and incomes from other sources of employment (e.g., commercial fishing) were greater in distant communities. Therefore, the impact on employment and income during the exploratory phase had a much higher magnitude of impact on the communities closest to the mine site than on more distant communities. It can be anticipated that the same pattern would occur during the operations phase; communities near the mine site and ferry/port terminals would see a greater employment impact than communities farther away, such as communities in the lower Bristol Bay watershed. This beneficial impact would last though the life of the project.

As most of the state’s professional and business service firms, including PLP’s office, are based in Anchorage, the Anchorage region would be anticipated to see an increase in jobs. However, the increase would be minor in relation to the larger and more diverse economy of Anchorage (approximately 130,000 employed workers in 2016). The extent of impacts from additional employment opportunities due to construction of the natural gas pipeline could reach to the Kenai Peninsula, with its oil services support industry. Similarly, services, particularly transportation and lodging that are based in Iliamna, and to a lesser extent in Homer, would also

be anticipated to see an increase in jobs. These increases would be higher over the short-term construction phase, and would be expected to occur if the project is permitted and built.

Cost of Living

As described in Section 4.12, Transportation and Navigation, Alternative 1 would result in the construction of mine and port access roads, spur roads, and ports. Although some components are described as private, PLP has stated that they would work with all local communities to identify the best solutions for use of the access roads and ferry for community transportation (PLP 2018-RFI 027). Because the higher cost of living in rural areas is primarily associated with the high transportation cost of food, fuel, and other supplies (ADOL 2008, 2017a), Alternative 1 has the potential to reduce transportation costs to the communities located near the transportation corridor should arrangements be made to allow some controlled public use of the mine and port access roads and spur roads. It should be noted that state and local authorizations may affect final road alignment and uses. Reduced transportation costs would lower the high cost of living for the communities near the transportation corridor, specifically Kokhanok, Iliamna, Newhalen, and potentially Nondalton. This would be a beneficial long-term impact lasting the life of the project. The beneficial impacts would be expected to occur if the project is permitted and the transportation system is built as described for Alternative 1.

Communities adjacent to the natural gas pipeline (Kokhanok, Newhalen, and Iliamna) would have the opportunity to connect to the pipeline, depending on arrangements made with PLP. Natural gas would likely be less expensive than diesel heating oil. This impact could lower cost of living once equipment (e.g., furnace, water heater) is converted to natural gas. However, communities would be responsible for funding the connections and conversions, lowering the potential of a long-term economic benefit. These beneficial impacts would be long term, lasting through the life of the project, and would be expected to occur if the project is permitted and the natural gas pipeline is built.

Regional Infrastructure

The temporary and long-term camps housing workers would be self-contained, and operated and maintained by PLP throughout the project. The work camps would be in remote areas, and employees would not have access to services in local communities. Therefore, local community services would not be adversely impacted by additional workforce population needs. In addition to housing facilities, the camps would be equipped with appropriate emergency medical facilities, electrical power generation, fuel storage, and facilities for sewage treatment and solid waste disposal and management. Potable water for the camps would be trucked in or sourced from on-site wells.

The direct effects of all phases of the project on public utilities in communities in the EIS analysis area would not be apparent, except for communities situated along the corridor of the natural gas pipeline, which may develop infrastructure to take advantage of the supply of natural gas or experience reduced costs of goods and services through access to the project transportation system. However, local employment opportunities could offset current trends of outmigration in some communities, and provide service fee revenue to maintain or even improve community infrastructure. These direct beneficial impacts would last the life of the project and would extend to communities in the EIS analysis area.

The sections below address the direct and indirect impacts to the regional infrastructure from activities associated with Alternative 1. However, the sections do not address changes in the regional infrastructure associated with potential decisions made by Lake and Peninsula Borough (LPB) or the State of Alaska related to the use of increased tax revenues. An increase in tax

revenues may lead to an increase in spending on regional infrastructure, which would improve infrastructure for the population of the region.

Education

The PLP has supported training and education programs in Alaska, such as the Alaska Native Science and Engineering Program, Teacher Industry Externship Program, and Alaska Resource Education (PLP 2018e). These activities would be anticipated to increase with Alternative 1 as the needs of the workforce expand. Conversely, some cultural education opportunities would be displaced, such as the current cultural camps that are held at the site of the proposed Amakdedori port, at Groundhog Mountain, Frying Pan Lake, Upper Talarik Creek and Koktuli River watersheds, and a stand of cottonwoods (Alaska Heritage Resources Survey site ILI-00254). This would be an adverse impact lasting the duration of the project if suitable alternatives cannot be found. The extent of impacts would be to communities in the EIS analysis area.

While the project is not anticipated to result in an increased number of schools in the region, it may benefit the educational opportunities of some communities through an increased revenue stream to the LPB and access to PLP-supported education programs. Because of declining population (i.e., out-migration) in some communities, schools are at risk of closing (LPB 2012). The project could reduce or eliminate this decline, thus allowing the local schools to remain open and continue to serve the local communities. This is a beneficial long-term effect, which would last for the life of the project. Conversely, steady employment and income may provide some families the ability to move to other areas, which may decrease the population of some communities. These impacts would be expected to occur if the project is permitted and built as described for Alternative 1.

Transportation

Alternative 1 would expand the transportation infrastructure in the region once the transportation corridor and ferry/port facilities are complete. Although the mine and port access roads and port are described as private, PLP has stated that they would work with all local communities to identify the best solutions for controlled use of the access roads and ferry for community transportation needs, which would help reduce the local cost of living (PLP 2018-RFI 027). Access to the infrastructure would be limited to local residents and businesses; it would most likely consist of escorted, scheduled convoys for private vehicle transport, and require coordination with PLP on third-party commercial-haul traffic on the access roads. Road traffic would be coordinated with scheduled third-party transportation by the ferry. The duration of this beneficial impact would be measurable and long term, lasting for the life of the project. The impacts would be certain to occur if the project is permitted and the transportation corridor and port facilities are constructed.

Because many of the workers and supplies would be transported to the region by air, the Iliamna Airport and local airfields would see increased use. While no direct impacts are expected to airport infrastructure, the airport would likely see indirect impacts, such as an increase in fuel sales and maintenance activities related to increased air traffic. This in turn could create additional indirect employment and economic activity at Iliamna and other airport hubs. Section 4.12, Transportation and Navigation, describes the impacts to air, surface, and water transportation systems. The impacts would be long term lasting for the life of the project, but would be greater over the short-term construction phase. The impacts would be expected to occur if the project is permitted and built.

With port and ferry features removed at closure, only the access roads and shallow draft barge facilities would remain for use in transporting bulk supplies associated with the closure operations, unless an agreement was reached for a third party to take over ferry operations. Access to the remaining infrastructure would likely be similar to that described above.

Health Services

The mine site would have on-site medical facilities to support workers. Many of the workers would be trained in emergency response and first aid. Most immediate care operations would be handled internally. Patients may be transported to a local clinic or airlifted to larger regional hospitals if needed. Therefore, existing health services are not anticipated to be directly impacted by the project. However, depending on the level of development associated with support services, there may be indirect beneficial or adverse impacts on these facilities for the life of the project. The extent of any indirect impacts would be anticipated in the communities nearest the mine site (i.e., Iliamna and Newhalen), which may have the highest level of indirect development to support the mining operations. In addition, an increased revenue stream to the LPB and stabilization of population levels attributable to employment opportunities could result in improvements to community health care facilities throughout the borough. The duration of these impacts would be long term over the life of the project and would be expected to occur if the project is permitted and built.

Water, Sewer, and Solid Waste

The project would construct temporary water and wastewater facilities at various sites used for project construction camps, and at the mine site, ferry terminals, and at Amakdedori port during operations. In addition, project generated solid waste would be addressed on site or removed from the area. As a result, existing community water, sewer, and solid waste facilities would not be directly impacted by the project. However, depending on the level of indirect activity associated with support services, there may be indirect beneficial or adverse impacts on these facilities lasting for the life of the project. The extent of indirect impacts would be the communities nearest the mine site. Similarly, an increased revenue stream to the LPB and stabilization of population levels attributable to employment opportunities could result in improvements to community water, wastewater, and solid waste services and facilities throughout the borough. The duration of these impacts would be long term over the life of the project and would be expected to occur if the project is permitted and built.

4.3.2.2 Potentially Affected Communities

Construction and operations would have direct and indirect impacts to local and regional socioeconomic conditions.

Population

As discussed in Section 3.3, Needs and Welfare of the People—Socioeconomics, the population of some of the potentially affected communities has been declining, particularly in the LPB. Much of this decline has been associated with the lack of employment opportunities in the communities.

Alternative 1 would result in an additional estimated 2,000 direct jobs created during the construction phase and 850 direct jobs created during the operations phase. It is estimated that during operations, 250 employees would come from surrounding communities, and a majority of the remaining 600 would be flown in from Anchorage or Kenai (PLP 2018-RFI 027). Workers would be transported from multiple locations, including from local communities, to the mine site

via aircraft or other approved transport such as local roads, and would stay in work camps during their shift. Therefore, workers could live throughout the state and in other states and still have the ability to work at the mine. As a result, the local communities would not be anticipated to see a large increase in population from the project, particularly from in-migration. The largest impacts could occur in Iliamna, Kokhanok, Newhalen, and potentially Nondalton, which may see an increase in population related to any businesses that are developed to support the project.

While a large in-migration of population is not anticipated, Alternative 1 may lead to changing population patterns in the region. The population in some potentially affected communities has been declining (out-migration). The magnitude of project impacts could reduce or eliminate the population decline because of the increase in employment opportunities and indirect effects on education and infrastructure; it could also result in some past residents returning to communities. Conversely, steady employment and income may provide some families the ability to move to other areas, which may decrease the population of some communities. Therefore, the impacts on population are difficult to anticipate.

Economy and Income

Estimating how many local community members would obtain work through the project (or would be interested in obtaining work) is difficult, but any increase in the number of jobs would help the local communities. Loeffler and Schmidt (2017) found that during the pre-development phase of the Pebble Project (2009 to 2012), community members from the region accounted for about 43 percent of the project's seasonal workforce. Communities near the mine site were found to provide a much higher percentage of local labor than more distant communities, where opportunities and incomes from other sources of employment (e.g., commercial fishing) were greater. Therefore, the impact on employment and income during the exploratory phase had a much higher magnitude of impact on the communities closest to the mine site than more distant communities.

PLP has stated that its objective is to maximize opportunities for local hire; first, directly to residents of the EIS analysis area, or those with close ties to the area; and then to Alaska residents in general. However, it is likely that during the construction phase, substantial local resident and non-Alaskan labor would be required to fill the anticipated 2,000 jobs required, potentially as high as 50 percent of hires (PLP 2018-RFI 027).

A majority of jobs would be taken by Alaskans during operations. PLP has estimated that 250 employees would come from the surrounding communities, with 50 of these employees coming from communities connected to the project site by road (PLP 2018-RFI 027). The majority of the remaining 600 employees would likely be from the Anchorage and Kenai areas. Therefore, the extent of beneficial impacts would be larger than the EIS analysis area and communities in that area. Operations jobs would be long term lasting for the life of the project and would be certain to occur if the project is permitted and built.

The direct jobs created by the project would be attractive to many residents with the requisite skills. In general terms, developments like the project provide economic benefits to individuals, families, and communities in increased and steady income. Many of the communities in the region, especially those in the LPB, have a lower median household income and a higher unemployment rate than Anchorage or Alaska as a whole. Therefore, employment through the project would have an impact on the income levels in the local communities.

The exploratory phase of the project revealed that the income earned by residents employed by the project was an important part of the total income earned in local communities, especially those communities close to the mine site (Loeffler and Schmidt 2017). The income earned by residents close to the mine working for PLP was greater than the income earned for commercial

fishing, indicating that even the limited employment during the exploratory phase had large impacts on the communities. In communities that were located further from the mine site, commercial fishing was a larger part of total income. Indirect employment that is developed to support the construction and operations of the project would provide additional opportunities for community residents.

On average, mining jobs pay much higher than most industry categories. The average monthly wage in Alaska for the mining industrial classification in the third quarter of 2017 was \$9,047, and mining support activities was \$7,855, which was higher than the average for Alaska of \$4,414 (ADOL 2017b). It should be noted that this average wage is likely for mine operations; construction wages would likely be lower. Because these figures are an average of all people employed in that classification, the monthly wage includes executives, specialized experts, and low-skill positions. Not all local residents would make the average wage. However, the wages earned would likely be higher than the median household incomes of the potentially affected communities (see Section 3.3, Needs and Welfare of the People–Socioeconomics), which would be an improvement to the welfare of the community members. For example, income from mining could be double the median household income in the LPB of about \$45,000. In addition, construction and operations of the mine would likely create opportunities for support services, creating indirect employment and income. This would most likely occur in support and transportation hubs, such as Iliamna and Port Alsworth, and in larger communities such as Anchorage and the Kenai Peninsula Borough (KPB). McDowell (2018c) estimates that modeling an employment multiplier of approximately 2.0 accurately captures the magnitude of total direct and indirect employment of the mining industry in Alaska (McDowell 2018c). Overall, the project would provide long-term beneficial impacts on the economy from employment and income in the region and state. These benefits would be expected over the life of the project and would be certain to occur if the project is permitted and built.

Tax Revenue and Other Fiscal Effects

The magnitude of impacts from construction and operations would generate revenues for local governments and the state of Alaska. The revenue sources would potentially include mining license taxes, corporate income taxes, property taxes, sales taxes borough severance taxes, and production royalty payments, depending on the nature of mining production, real property value, and taxation measures authorized by statute or ordinance. The duration of revenues to state and local governments would begin during the construction phase, and escalate during the operations phase when mining license taxes, production taxes, severance taxes, and corporate income taxes would become effective. At the time the mine ends operations, and buildings, foundations, pipelines, and other infrastructure facilities are removed or reclaimed, these revenues would end, unless reuse of some of these facilities was negotiated with another party. These tax revenues would be realized if the project is permitted and built.

Mining License Tax and Corporate Income Tax

Alaska levies a mining license tax and corporate income tax on net income received in connection with mining properties and activities in the state. The collection of mining license tax and corporate income tax on project net income would have a beneficial effect on state government revenues. The magnitude and extent of the benefit as estimated by IHS (2013) would be \$27 million annually in state taxes (2011) during the construction phase, and an estimated \$69 million annually in state corporate taxes during the operations phase. IHS estimates the operations phase would also generate \$44 million annually from state mining license taxes.

Corporate income tax may increase further through the indirect and induced impacts of the mine construction and operation.

State Royalty Payments

Alaska requires holders of state mining locations to pay a production royalty on all revenues received from minerals produced on state land, per the Production Royalty Law, which applies to all revenues received from minerals produced from a state mining lease (Section 38.05.212). The production royalty is 3 percent of net income generated (ADNR 2015).

The collection of state royalty payments on project net income would have a beneficial long-term (extending for up to decades over the life of the project) effect on state government revenues. IHS (2013) estimates that magnitude of the benefit would be \$21 million annually (2011) in state royalty payments during the operations phase. The duration of this benefit would be long term; it would be certain to occur if the project is permitted and built.

Borough Severance Taxes

Mining operations are subject to severance taxes on resource extractions in a taxing jurisdiction, which would be the LPB. IHS (2013) estimates that the magnitude and extent of project benefits would be \$29 million annually in severance taxes paid to LPB during the operations phase. The estimated severance tax would represent a significant increase in revenue for LPB when compared to the estimated total revenue from external sources of approximately \$5 million for fiscal year 2019 (LPB 2018d). Another potential source of revenue available to local governments is Payment in Lieu of Taxes (PILT), which is available to local governments as an alternative to property or severance taxes; the Northwest Arctic Borough currently receives PILT from the operation of the Red Dog mine. This beneficial effect would be expected to last over the life of the project and would be certain to occur if the project is permitted and built.

Borough Property Taxes

Real property can be subject to property taxes. The LPB does not have a property tax (LPB 2018d), but the KPB has a borough property tax of 4.7 mills¹, plus any other taxes assigned per the Tax Authority Group (e.g., hospital, road maintenance). The mill rate for the KPB is 4.70, meaning that for every \$1,000 of assessed taxable property value, the KPB receives \$4.70 in revenue.

Real property, including the Amakdedori port facilities and any other infrastructure located in the Kenai Peninsula Borough, would be taxed at a rate of 4.7 percent of its assessed taxable value. This includes the assessed value of the infrastructure itself, as well as a portion of the assessed land value (subject to lease terms). Mill rates are set annually by the borough assembly, municipalities, and service area boards. Beneficial impacts of increased property taxes to all boroughs affected would be long term and would be expected to occur if the project is permitted and constructed.

Right-of-Way Acquisition

The right-of-way (ROW) for the transportation corridor connecting the Amakdedori port to the mine site could be another fiscal element of the project. The State of Alaska would own 66 percent of the corridor, Alaska Peninsula Corporation would own 31 percent, and Iliamna Natives Limited would own 4 percent. Based on costs for a similar mine ROW and the value of

¹ A mill represents 0.1 percent of \$1, equal to \$1 of tax revenue for each \$1,000 of assessed taxable property value.

state lands (ADNR 2008), a preliminary estimate of the magnitude of ROW costs for the transportation corridor ranged between \$1 million and \$1.5 million, which would be paid to the state government and to the Native corporations, creating a long-term beneficial economic effect.

The pipeline corridor would cross state and federal waters, as well as state and Alaska Peninsula Corporation lands. Historically, ROW costs account for approximately 7 percent of the total construction cost of a pipeline (Rui et al. 2011). These benefits would be certain to occur if the project is permitted and the transportation corridor and pipeline are constructed.

Housing

Staff working at the mine would be housed in on-site facilities (i.e., work camps), and would follow a fly-in/fly-out or local road commute work arrangement. Therefore, there would not be an increase in housing demand in communities related to an influx of the direct employment of workers. However, employment opportunities could slow or reverse the decline in some communities, or encourage former residents to move back. This would affect the demand for local housing.

Communities closest to the mine and ferry terminals (i.e., Iliamna, Newhalen, Kokhanok, and potentially Nondalton) may see changes to the population as a result of support activities, which may lead to an increase in demand for housing. As presented in Section 3.3, Needs and Welfare of the People—Socioeconomics, vacant housing units are available in these communities. Although the condition of the vacant units is not known, some of the units could accommodate at least a portion of any increase in population. Housing is also available in the larger communities in the region where workers may reside. Overall, adverse impacts to housing supply would not be expected.

Education

While the project is not likely to result in substantive demographic increases that would support an increase in the number or capacity of schools in the potentially affected communities in the immediate vicinity of the project, an increase in tax revenue to the LPB and the education programs supported by PLP could benefit schools and the student population. In addition, the local employment opportunities associated with the project could reduce the population decline in some communities, which could allow schools at risk of closing to remain open; a long-term beneficial effect lasting for the life of the project.

As with other mining operations in Alaska, employment at the mine would require at least a high school education or general equivalency diploma. Therefore, students may see employment opportunities provided by the mine as an incentive to complete at least a basic level of education, which could increase the high school graduation rates in the potentially affected communities. Similar to the experience with other Alaska mining projects, it might also provide opportunities for participating in vocational training, particularly if PLP, the LPB, and Alaska Native organizations provide support.

4.3.2.3 Alternative 1 – Kokhanok East Ferry Terminal Variant

The Kokhanok East Ferry Terminal Variant would result in similar impacts to those described above for all project components. For this variant, the State would own 72 percent of the Kokhanok East Ferry Terminal Variant, and Alaska Peninsula Corporation would own 28 percent.

4.3.2.4 Alternative 1 – Summer-Only Ferry Operations Variant

Regional Economy – Alternative 1 includes a variant for summer-only ferry operations, in which the transportation corridor would only operate during the open water season (PLP 2018-RFI 065). As a result, more employees for truck drivers and ferry/terminal workers would be needed during summer operations, but fewer would be needed during winter operations, leading to less year-round employment opportunity and a larger number of seasonal employees. Therefore, this impact would be less beneficial than that described for Alternative 1 without the variant.

Cost of Living – Under the Summer-Only Ferry Operations Variant, communities that would rely on the project transportation system may opt to stockpile food, fuel, and other supplies or receive shipments via air when the ferry is not operating. Overall, the variant would likely lower the high cost of living for the communities near the transportation corridor, but not to the extent of the Alternative 1.

Economy and Income – Under the Summer-Only Ferry Operations Variant, the transportation corridor would only operate during the open water season. As a result, more employees (e.g., truck drivers, ferry/terminal workers) would be needed during summer operations, but fewer would be needed during winter operations (PLP 2018-RFI 065). This would lead to a smaller number of year-round employees and a large number of seasonal employees. Due to the small populations of the potentially affected communities, it is less likely that the communities would be able to meet all of the demand for the increased number of seasonal employees (in addition to the year-round employees), requiring more employees to come from outside the region for the seasonal work. In addition, other employment opportunities are available to local residents during the summer (e.g., construction and commercial fishing), whereas fewer opportunities exist during the winter months. Therefore, the variant would likely shift some of the positions held by community members from year-round to seasonal, which would also lower the overall income that is earned by community members and decrease the incentive to retain population in the region compared to year-round employment under year-round ferry operations.

4.3.2.5 Alternative 1 – Pile-Supported Dock Variant

The Pile-Supported Dock Variant would result in similar impacts to those described above for all project components.

4.3.3 Alternative 2 – North Road and Ferry with Downstream Dams

4.3.3.1 Regional Setting

Regional Economy

While the alignment of the transportation corridor and natural gas pipeline would change, Alternative 2 would have the same overall impacts to the regional economy as Alternative 1, but would have a different level of effects on specific communities due to differences in transportation corridor routes. Impacts to specific communities are discussed below.

Cost of Living

For the region as a whole, the impacts on the cost of living of Alternative 2 would be largely the same as the impacts of Alternative 1, and would likely lower the high cost of living for the communities near the transportation corridor. However, because of the different alignments of the transportation corridor and natural gas pipeline, Pedro Bay would be beneficially impacted

over the life of the project, and Kokhanok would likely see fewer beneficial impacts. This would be expected to occur if Alternative 2 is selected and the project is permitted and built.

Regional Infrastructure

While the alignment of the transportation corridor and natural gas pipeline would change, Alternative 2 would have the same overall impacts to the region as Alternative 1. However, Pedro Bay would experience more direct impacts, and Kokhanok would be impacted to a lesser extent.

4.3.3.2 Potentially Affected Communities

While the alignment of the transportation corridor and natural gas pipeline would change, Alternative 2 would have the same overall impacts to the socioeconomic indicators of the potentially affected communities as Alternative 1. However, Pedro Bay would experience greater impacts and Kokhanok would be less impacted.

Revenues from the ROW acquisition for the transportation corridor and the natural gas pipeline would be similar to Alternative 1 and would impact the State (which owns 40 percent of the corridor), Cook Inlet Region, Inc. (1 percent), Iliamna Natives Limited (27 percent), Pedro Bay Corporation (16 percent), Tyonek Corporation (1 percent), Seldovia Native Association, Inc. (3 percent), and Salamatof Native Association, Inc. (<1 percent).

4.3.3.3 Alternative 2 – Summer-Only Ferry Operations Variant

Regional Economy – Alternative 2 includes a variant for summer-only ferry operations. The impacts of the variant would be the same as described in the similar Alternative 1 variant.

Cost of Living – Alternative 2 includes a variant for summer-only ferry operations. The impacts of the variant would be the same as described in the similar variant for Alternative 1.

Potentially Affected Communities – Alternative 2 includes a variant for summer-only ferry operations. The variant would be the same as described for Alternative 2.

4.3.3.4 Alternative 2 – Pile-Supported Dock Variant

The Pile-Supported Dock Variant would result in similar impacts to those described above for all project components.

4.3.4 Alternative 3 – North Road Only

4.3.4.1 Regional Setting

Regional Economy

While the alignment of the transportation corridor and natural gas pipeline would change, Alternative 3 would have the same overall impacts to the regional economy as Alternative 1. The distribution of effects between communities would be similar to Alternative 2.

Cost of Living

For the region as a whole, the impacts on the cost of living for Alternative 3 would be largely the same as the impacts of Alternative 1; the magnitude of the impact would be to lower the high cost of living for the communities near the transportation corridor, similar to Alternative 2. However, because of the different alignments of the transportation corridor and natural gas

pipeline, Kokhanok would likely experience less of a benefit, while Pedro Bay would likely experience more of a benefit over the long term. These impacts would be expected to occur under Alternative 3.

Regional Infrastructure

While the alignment of the transportation corridor and natural gas pipeline would change, Alternative 3 would have the same overall impacts to the region as Alternative 1, with the exception of the ferry terminals. However, Kokhanok would experience fewer impacts, while Pedro Bay would experience more. One potential benefit of the alternative is that it would be more likely that regional governments and/or the state would maintain the access roads for public use following closure of the mine.

4.3.4.2 Potentially Affected Communities

While the alignment of the transportation corridor and natural gas pipeline would change, Alternative 3 would have the same overall impacts to the socioeconomic indicators of the potentially affected communities as Alternative 1. However, Kokhanok may experience fewer impacts, while Pedro Bay would experience greater impacts.

Revenues from the ROW acquisition for the transportation corridor and the natural gas pipeline would be similar to Alternative 1 and would impact the State (which owns 32 percent of the corridor), Cook Inlet Region, Inc. (1 percent), Iliamna Natives Limited (19 percent), Pedro Bay Corporation (38 percent), Tyonek Corporation (6 percent), Seldovia Native Association, Inc. (>1 percent), and Salamatof Native Association, Inc. (>1 percent).

4.3.4.3 Alternative 3 – Concentrate Pipeline Variant

Regional Economy – The magnitude of impacts of this variant would be decreased employment of truck operators and increased employment at the dewatering facility. Overall, the total number of employees needed during operations would likely decrease, which would decrease overall income and employment in the region. It could potentially have greater impact on property taxes for KPB than Alternative 1, depending on final footprint and project specifics.

Regional Infrastructure – The magnitude of impact of this variant would be the construction of the pipeline(s) and a dewatering facility near the port, which would likely be of no value and/or benefit to the potentially affected communities or the region as a whole, other than potential property tax revenue.

Potentially Affected Communities – The magnitude of impacts of this variant would be decreased employment of truck operators and increased employment at the dewatering facility. Overall, the total number of employees needed during operations would likely decrease, which would decrease the overall income and employment in the potentially impacted communities. However, the Kenai Peninsula Borough would receive an increase in property taxes levied on the assessed value of the portion of the concentrate pipeline located in the borough. This impact would be long term and would be expected to occur under Alternative 3.

4.3.5 Summary of Key Issues

See Table 4.3-1 for a summary of key issues.

Table 4.3-1: Summary Impact Table for the Socioeconomic Environment

Project Impact	Alternative 1 (and variants)	Alternative 2 (and variants)	Alternative 3 (and variant)
Population	<p>Communities nearest the project components (Newhalen, Iliamna, Nondalton, and Kokhanok) may see a slight population increase.</p> <p>There would be no difference in impacts from variants.</p>	<p>Same as Alternative 1 except that impacts would be less likely to occur to Kokhanok because it would not be located on the transportation corridor and would occur in Pedro Bay.</p> <p>There would be no difference in impacts from variants.</p>	<p>Same as Alternative 1, except that impacts would be less likely to occur to Kokhanok and more likely to occur in Pedro Bay.</p> <p>There would be no difference in impacts from the variant.</p>
Economy and Income	<p>Alternative 1 would provide year-round employment, a positive impact which would help reduce the impacts of the seasonal fluctuations in employment. During construction, there would be an estimated 2,000 direct jobs, and during operations there would be an increase of direct employment by 850 people, plus indirect employment related to support services. Communities nearest the project components (Newhalen, Iliamna, Nondalton, and Kokhanok) would likely see the greatest impacts in employment and income.</p> <p>The Summer-Only Ferry Operations Variant would result in less year-round employment and greater seasonal employment, with less income remaining in the potential affected communities.</p>	<p>Same as Alternative 1 except that impacts would be less likely to occur to Kokhanok and more likely to Pedro Bay.</p> <p>The impacts of the Summer-Only Ferry Operations Variant would be the same as described for the variant for Alternative 1.</p>	<p>Same as Alternative 1, except that impacts would be less likely to occur to Kokhanok and more likely to Pedro Bay.</p> <p>The Concentrate Pipeline Variant would have less employment opportunities, which would decrease overall income.</p>
Tax Revenue and Other Fiscal Effects	<p>Alternative 1 would generate:</p> <ul style="list-style-type: none"> • \$27 million annually in state taxes (2011) during construction. • \$69 million annually from state corporate taxes during the operations phase. • \$21 million annually (2011) from state royalty payments during the operations phase. • \$29 million annually in severance taxes for LPB. • Annual property taxes to KPB based on the assessed value of project related real property. 	<p>Same as Alternative 1.</p>	<p>Same as Alternative 1.</p> <p>The Concentrate Pipeline Variant would have greater impact on property taxes for KPB than Alternative 1, and the total number of employees needed during operations would likely be less.</p>

Table 4.3-1: Summary Impact Table for the Socioeconomic Environment

Project Impact	Alternative 1 (and variants)	Alternative 2 (and variants)	Alternative 3 (and variant)
Cost of Living	Reduced transportation costs would likely lower the high cost of living for the communities near the transportation corridor (Newhalen, Iliamna, Nondalton, and Kokhanok), a positive impact. The natural gas pipeline would also provide opportunities for adjacent communities to lower their winter heating costs, a positive impact. The Summer-Only Ferry Operations Variant would likely have less impact than Alternative 1, as transportation costs would only be reduced in the summer.	Same as Alternative 1 except that impacts would occur to Pedro Bay and not Kokhanok. The Summer-Only Ferry Operations Variant would likely have less impact than Alternative 1, as transportation costs would only be reduced in the summer.	Same as Alternative 1, except that impacts would occur to Pedro Bay and not Kokhanok. The Concentrate Pipeline Variant could potentially have greater impact than Alternative 1 because of greater potential for public use of the north access road.
Regional Infrastructure	Alternative 1 would increase the infrastructure in the region. The impact of the transportation corridor depends on the access afforded to communities. Communities located along the natural gas pipeline may also benefit from the infrastructure.	Same as Alternative 1 except that impacts would be less likely to occur to Kokhanok and more likely to occur to Pedro Bay. There would be no difference in impacts from variants.	Same as Alternative 1 except that impacts would be less likely to occur to Kokhanok and more likely to occur to Pedro Bay. There would be no difference in impacts from the variant.

4.3.6 Cumulative Effects

The cumulative effects analysis area includes the region around the potentially affected communities, and to a lesser extent, the state of Alaska. Similar to the proposed project, opportunities would also exist for employment for people living across a broad area of Alaska. Potential cumulative effects could occur on the regional and state economy, infrastructure, cost of living, government revenue, and population characteristics.

The reasonably foreseeable future actions (RFFAs) identified in Section 4.1, Introduction to Environmental Consequences, that could contribute to the regional and state socioeconomic cumulative impacts and are carried forward in this analysis include expansion of the Pebble Project, continuing exploration of mineral deposits; oil and gas development in Cook Inlet; road improvement projects; and continuance of commercial recreation activities in the greater regional area, as summarized below:

- Pebble Project Expansion
- Pebble South/PEB*
- Big Chunk South*
- Big Chunk North*
- Fog Lake*
- Groundhog*
- Shotgun*
- Johnson Tract*
- Donlin Gold
- Alaska Stand Alone Pipeline
- Drift River Oil Pipeline
- Cook Inlet Lease Sales*
- Alaska LNG
- Onshore Hydrocarbon Exploration*
- LPB Transportation Projects

- LPB Community Development and Capital Improvement Projects
- LPB Renewable Energy Initiatives
- Bristol Bay - Nushagak and Naknek/Kvichak State Management Districts - Salmon
- Lower Cook Inlet Management Area- Salmon and Herring
- Federal, state institutional, and private surveys and research*

**Indicates exploration and research activities only.*

4.3.6.1 Past and Present Actions

Past and present actions that have contributed to the existing socioeconomic conditions of potentially affected communities include natural resource extraction, commercial and subsistence fishing activities, commercial recreation and tourism, community development and infrastructure, mining exploration activities, and the construction and operation of the Williamsport-Pile Bay Road. Changes in fishing technology and the variability of fish returns have impacted the regional economy from year-to-year. The trend of declining local ownership of fishing permits has decreased the amount of local employment and income in some parts of the region, notably the area around Iliamna Lake. Fluctuations in oil prices have affected the availability of state and local revenue, affecting capital improvement projects and services in the region. When major projects are developed, there is often high employment associated with construction cycles, which then drops during operation cycles. Additionally, seasonal employment fluctuation exists at the regional level, largely due to seasonality of commercial fishing, construction, and tourism industries. Limited transportation infrastructure keeps cost of living high, which is offset somewhat by subsistence hunting and fishing. Declining population in some communities of the LPB have resulted in school closures when the number of students drops below the state minimum of 10 students to keep schools open.

4.3.6.2 Reasonably Foreseeable Future Actions

No Action Alternative

The No Action Alternative would not contribute to cumulative effects on the regional and state economy, infrastructure, cost of living, and population characteristics. While there may be some decrease in the current level of economic activity generated by exploration of the Pebble project, exploration activities could continue.

Alternative 1 – Applicant’s Proposed Alternative

Pebble Mine Expanded Development Scenario – The Pebble mine expanded development scenario would extend the life of the project to recover more of the estimated reserves. The Pebble mine expanded development scenario would continue, and likely increase, the beneficial and adverse impacts that would be realized from the project. Employment and income impacts, as well as tax revenue and cost of living reductions, realized from the expansion would continue through the 78-year expansion period. If a severance tax on production was imposed by the LPB, increased production would generate additional local tax revenue. Similarly, if a new deepwater port was constructed in Iniskin Bay, it would generate additional tax revenue for the KPB. Any impacts to population, housing, and education would be anticipated to remain the same as experienced during the operation of the project, but extend for the longer period of

expansion. However, Pedro Bay would experience greater impacts under the Pebble mine expanded development scenario than if just the proposed project were implemented alone.

Donlin Gold – While the proposed Donlin Gold Project could potentially create state-wide competition for skilled workers, it would be located in a different region and would have little contribution to the regional socioeconomic effects. From a state-wide perspective, both the Donlin Gold Project and the Pebble Mine Project could create a competing need for support services and secondary/indirect jobs associated with such services.

Other Mineral Exploration Projects – The RFFAs related to continuing mining exploration activities would likely induce some measurable cumulative effects to the socioeconomic characteristics of the potentially affected communities during the exploratory phases, primarily through limited employment and support service activities. The cumulative impacts from mineral exploration and the project would be greatest during summer months since most mineral exploration activities would be limited to summer. Therefore, the contribution to cumulative effects would be greater with the Summer-Only Ferry Operations Variant, along with other mineral exploration projects during summer months, contributing to the seasonal work imbalance and further increasing the demand for summer employees and likely requiring more employees from outside the region for seasonal work.

Oil and Gas Exploration and Development – The RFFAs related to oil and gas exploration and development would likely induce some measurable cumulative effects to the socioeconomic characteristics of the potentially affected communities during the exploratory phases. If these projects are developed, they could create a competing need for direct employees, support services, and secondary/indirect jobs associated with such services, but offshore exploration activities would be supported out of the KPB, where there is a mature oil support service industry. Any continuing onshore oil and gas exploration on the Alaska Peninsula would be small in scale, and supported out of King Salmon rather than Iliamna Lake communities.

Road Improvement and Community Development Projects – The RFFAs related to transportation and infrastructure improvements, as well as renewable resources, could have an impact on the potentially affected communities. The projects could create small scale construction and operations employment opportunities, improve services, and potentially lower the cost of living. It is possible that such projects would support additional business development, taking advantage of the infrastructure and energy improvements. Community construction projects are a particularly important source of seasonal employment and income for small communities. These impacts would be anticipated to be greater if the project is implemented, which could increase development as support-related businesses take advantage of the additional opportunities provided by the mine.

Alternative 2 – North Road and Ferry with Downstream Dams

Pebble Mine Expanded Development Scenario – Expanded mine site development and associated contributions to cumulative impacts to the region would be the same as Alternative 1. Under Alternative 2, project expansion would continue to use the existing Diamond Point port facility, would use the same natural gas pipeline, and would use the constructed portion of the north access road. After 20 years, the ferry would be discontinued, road connections between ferry terminals would be constructed similar to what is described in Alternative 3, and the port site and associated facilities would be constructed at Iniskin Bay as discussed under Alternative 1 above. The concentrate pipeline from the mine site to Iniskin Bay would be constructed similar to Alternative 3, and a diesel pipeline from the mine site to Iniskin Bay would be constructed as discussed under cumulative effects for Alternative 1. Beneficial cumulative impacts from Alternative 2 combined with the Pebble mine expanded development scenario to income and

infrastructure would be less than Alternative 1 because the north ferry operation would be discontinued, and the south transportation system/ferry would not be in place. Therefore, employment opportunities would be lower since employees would not be required at those locations and the facilities would not generate taxable income.

Other Mineral Exploration Projects, Road Improvement and Community Development Projects – Cumulative effects of these activities would be similar to those discussed under Alternative 1.

Alternative 3 – North Road Only

Pebble Mine Expanded Development Scenario – Expanded mine site development and associated contributions to cumulative impacts would be the same as Alternative 1. Under Alternative 3, project expansion would continue to use the existing Diamond Point port facility, would use the same natural gas pipeline, and would use the same north access road and Concentrate Pipeline Variant, but extend the concentrate pipeline to Iniskin Bay. The port site and associated facilities would be constructed at Iniskin Bay as discussed under Alternative 1 above. A diesel pipeline from the mine site to Iniskin Bay would be constructed as discussed under cumulative effects for Alternative 1. Cumulative tax generation and cost of living benefits would be similar to Alternative 2. Beneficial cumulative impacts from Alternative 3 combined with the Pebble mine expanded development scenario to income and infrastructure would be less than Alternative 1 and 2 because no ferry operation would be in place and the north access road system used for the Pebble mine expanded development scenario would already be built under Alternative 3. Therefore, employment opportunities associated with truck traffic would be lower since employees would not be required at those locations and the facilities would not generate additional taxable income.

Other Mineral Exploration Projects, Road Improvement and Community Development Projects – Cumulative effects of these activities would be similar to those discussed under Alternative 1.