Appendix G

Social Conditions
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1.1 Conceptual Framework

Human development and well being are expanding arenas for academic and policy research. “Human development” usually refers to components of human welfare, including measures of health, education, and standard of living. In assessing human development, the Arctic Human Development Report (AHDR) observed the following:

Most Arctic Residents value fate control or the ability to determine their own destinies. Highly valued also is cultural continuity in the sense of nurturing traditional values and ways of life, even while embracing some of the obvious benefits of modernization. Close relationships with the natural world together with a sense of belonging to the land (and the sea) are important as well. Many of the Arctic’s residents would not want to exchange this way of life for the lifestyles of residents of southern metropolises, even though such a life may offer higher standards of living in material terms (AHDR 2004).

The AHDR therefore expands the dimensions of human development and well being within the Arctic to include: standard of living, health, education, ties to nature, cultural continuity, and fate control. AHDR left it to future research to develop indicators to measure these components of human welfare. These six aspects of human development are discussed in greater detail, along with the effects of operations of the Red Dog Mine on these aspects in the remainder of this appendix.

1.1.1 Survey of Living Conditions in the Arctic Data

The Survey of Living Conditions in the Arctic (SLiCA) interviewed over 580 Native people in three regions in Alaska: the Bering Strait Region; the North Slope Region; and the Northwest Arctic region. This data set provides valuable insight into activities, ways of life, and values of the Native Iñupiat of Alaska. The lengthy, face-to-face interviews generated as many as 950 variables per respondent. SLiCA survey results show that, despite widespread poverty (in terms of traditional measures of income), 90 percent of respondents are satisfied with their life as a whole. The primary factors predicting life satisfaction are:

- family ties;
- social support networks;
- income and employment;
- subsistence activities; and
- local control of resources.

The biggest problem, cited by 83 percent of respondents, is unemployment. Forty-two percent have considered moving to another community, and the most frequently cited motive is better job
opportunities. Yet 77 percent of households prefer to combine wage paying jobs with subsistence activities. Subsistence and social relationships are the most important reasons people choose to remain in small communities, despite the lower (cash-based) standard of living (Poppel et al. 2007).

Jobs and income are also important factors for well-being. Closer analysis, however, shows that the effects of employment and income on subjective well being are mixed. Consistent with the findings of Lane (2000), the benefits of increasing income are concentrated at the low end of the income distribution, with diminishing returns to well being as income rises. Results from SLiCA research indicates the threshold is around 60 percent of the median personal income in the respective region. For people with income below that 60 percent level, increasing income correlates with increasing subjective well being, but the correlation largely disappears above that level (Poppel et al. 2007).

The relationship between employment and subjective well being is even more complicated. While the raw correlation in SLiCA data between employment and subjective well being is positive, Martin (2005) identified a negative correlation when using more variables. “The negative relationship may be because jobs take time away from participating in family, social and community activities that are [more] important for satisfaction” (Martin 2005: 142).

### 1.2 Standard of Living

Income and employment are discussed at length in the body of the SEIS (Section 3.17). This appendix provides supplemental information that has been considered in the analysis, including the cost of living and the social impacts of jobs and employment.

#### 1.2.1 Cost of Living

The primary components of cost of living are housing, energy, and food. Table 1 shows average monthly housing and utility costs for owner-occupied homes from the 2000 U.S. Census, reported in 2008 dollars. Anchorage is higher than the Alaska average, due to higher non-energy housing costs. Northwest Arctic Borough (NWAB) communities are below the Alaska average, because in general, their non-energy housing costs are lower. Table 2 reveals one reason that housing costs tend to be lower in remote rural Alaska. In 2000, 32 percent of households in remote rural Alaska were owned free and clear, with no rent or mortgage, compared to only 16 percent in non-rural areas. Only 27 percent of remote rural homes were owned with a mortgage or loan, compared to 47 percent in non-rural areas. The proportion of renters was about the same.

Energy costs, which make up a large share of total household costs – especially for rural households – have increased substantially since 2000. As a result, these 2000 aggregate numbers do not reflect the current reality. Energy costs increased more since 2000 for rural Alaska communities than for urban areas. As a result, ownership costs in the NWAB have moved closer to the Alaska average. Table 3 shows median annual home energy costs by region for 2000 and 2008, estimated for 2008 based on consumption levels in 2000 at May 2008 prices. Since 2000, the median real cost of home energy for Anchorage households increased less than 50 percent, while in remote rural Alaska—which includes the NWAB—it increased by over 130 percent.
1.2 Standard of Living

Table G-1. Average Selected Monthly Owner Costs for Specified Owner-occupied Housing Units, 2000 (2008 dollars)

<table>
<thead>
<tr>
<th>Location</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchorage</td>
<td>$1,689</td>
</tr>
<tr>
<td>Alaska</td>
<td>$1,406</td>
</tr>
<tr>
<td>Kotzebue</td>
<td>$1,313</td>
</tr>
<tr>
<td>Northwest Arctic Borough</td>
<td>$947</td>
</tr>
<tr>
<td>Kiana city</td>
<td>$876</td>
</tr>
<tr>
<td>Noatak</td>
<td>$827</td>
</tr>
<tr>
<td>Noorvik</td>
<td>$791</td>
</tr>
<tr>
<td>Kobuk</td>
<td>$768</td>
</tr>
<tr>
<td>Buckland</td>
<td>$768</td>
</tr>
<tr>
<td>Selawik</td>
<td>$682</td>
</tr>
<tr>
<td>Ambler</td>
<td>$670</td>
</tr>
<tr>
<td>Deering</td>
<td>$660</td>
</tr>
<tr>
<td>Shungnak</td>
<td>$632</td>
</tr>
<tr>
<td>Kivalina</td>
<td>$620</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau

Table G-2. Home Ownership in Alaska, 2000

<table>
<thead>
<tr>
<th>Ownership Status</th>
<th>Non-rural</th>
<th>Remote Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owned free and clear</td>
<td>16%</td>
<td>32%</td>
</tr>
<tr>
<td>Owned with mortgage or loan</td>
<td>47%</td>
<td>27%</td>
</tr>
<tr>
<td>No cash rent</td>
<td>4%</td>
<td>8%</td>
</tr>
<tr>
<td>With cash rent</td>
<td>33%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, IPUMS (Ruggles et. al 2008)


<table>
<thead>
<tr>
<th>Year</th>
<th>Anchorage</th>
<th>Kenai &amp; Mat-Su</th>
<th>Mid-Size &amp; Roaded</th>
<th>Remote Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>$1,866</td>
<td>$2,239</td>
<td>$2,488</td>
<td>$3,284</td>
<td>$2,239</td>
</tr>
<tr>
<td>2008**</td>
<td>$2,735</td>
<td>$3,465</td>
<td>$4,934</td>
<td>$7,586</td>
<td>$3,504</td>
</tr>
<tr>
<td>% increase of median</td>
<td>47%</td>
<td>55%</td>
<td>98%</td>
<td>131%</td>
<td>56%</td>
</tr>
</tbody>
</table>

* Includes costs for electricity, gas, and heating fuel, but not gasoline or other fuel for transportation.
** Estimated at 2000 consumption levels at May 2008 prices (Haley et al. 2008)
Sources: U.S. Census Bureau (IPUMS), Institute of Social and Economic Research (Haley et al. 2008)

Table 4 shows the estimated average monthly electric bill paid by customers in Kotzebue, Kivalina and Noatak, after the Power Cost Equalization (PCE) subsidy. In 2008 dollars, the average monthly bills

---

1 The U.S Census Bureau defines selected monthly owner costs as “the sum of payments for mortgages, deeds of trust, contracts to purchase, or similar debts on the property (including payments for the first mortgage, second mortgage, home equity loans, and other junior mortgages); real estate taxes; fire, hazard, and flood insurance on the property; utilities (electricity, gas, and water and sewer); and fuels (oil, coal, kerosene, wood, etc.). It also includes, where appropriate, the monthly condominium fees or mobile home costs (installment loan payments, personal property taxes, site rent, registration fees, and license fees).” Specified owner-occupied housing units are defined as “1-family houses on less than 10 acres without a business or medical office on the property. The data for ‘specified units’ exclude mobile homes, houses with a business or medical office, houses on 10 or more acres, and housing units in multiunit buildings.”

2 We calculated these figures from average kWh sold, average gross billed, and fiscal year-end PCE amount, by subtracting from the average gross billed the average kWh sold (to a maximum of 500) times the PCE amount. We adjusted the numbers to 2008 dollars using the Anchorage CPI.
range from about $60 to $200, and are typically between $100 and $150. Kivalina and Noatak have both seen increases in their electric bills since 2000. In contrast, Kotzebue’s average monthly bill declined by almost half. This can be attributed primarily to an increase of Kotzebue’s PCE subsidy from $0.0919 per kWh in 2005 to $0.1731 per kWh in 2006.

Table G-4. Estimated Average Net Monthly Electric Bill for Residential Customers (2008 dollars)

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Kotzebue</th>
<th>Kivalina</th>
<th>Noatak</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>$115.68</td>
<td>$89.93</td>
<td>$137.84</td>
</tr>
<tr>
<td>2001</td>
<td>$110.81</td>
<td>$117.84</td>
<td>$144.91</td>
</tr>
<tr>
<td>2002</td>
<td>$118.24</td>
<td>$142.90</td>
<td>$125.99</td>
</tr>
<tr>
<td>2003</td>
<td>$110.99</td>
<td>$107.25</td>
<td>$129.72</td>
</tr>
<tr>
<td>2004</td>
<td>$127.46</td>
<td>$141.43</td>
<td>$194.41</td>
</tr>
<tr>
<td>2005</td>
<td>$114.10</td>
<td>$131.45</td>
<td>$159.45</td>
</tr>
<tr>
<td>2006</td>
<td>$67.31</td>
<td>$82.05</td>
<td>$106.13</td>
</tr>
<tr>
<td>2007</td>
<td>$57.74</td>
<td>$116.18</td>
<td>$156.29</td>
</tr>
</tbody>
</table>

Source: Alaska Energy Authority and ISER calculations

The Cooperative Extension food cost survey in March, 2008, shows current cost comparisons between Kotzebue and Anchorage for food, electricity, heating oil and gasoline. As Table 5 shows, current electric costs in Kotzebue are much higher than in Anchorage, even after being offset by the PCE subsidy. Heating oil costs $4.45 per gallon in Kotzebue. For comparison, the energy-equivalent amount of natural gas in Anchorage would cost about $1.08. At the time of the survey, gasoline cost $5.50 per gallon in Kotzebue compared to $3.30 per gallon in Anchorage. The cost of food for a typical family of four in Kotzebue is nearly twice the cost of food for a similar family in Anchorage.

Table G-5. Cost of Food, Electricity, and Fuel for Kotzebue and Anchorage, March 2008

<table>
<thead>
<tr>
<th>Weekly Food Cost (family of 4)</th>
<th>Electricity (1000 kWh)</th>
<th>Heating (oil or gas)*</th>
<th>Gasoline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kotzebue</td>
<td>$261.73</td>
<td>$154.01</td>
<td>$4.45</td>
</tr>
<tr>
<td>Anchorage</td>
<td>$134.05</td>
<td>$128.82</td>
<td>$1.08</td>
</tr>
</tbody>
</table>

* Price for Kotzebue is per gallon of heating oil; price for Anchorage is the cost of the energy-equivalent quantity of natural gas (1.348 CCF).


Although none of the smaller communities in the NWAB were included in the survey, their costs are higher than Kotzebue because of additional transportation costs and decreased economy of scale. For example, on October 22, 2008 fuel prices in Noatak were $9.79 per gal for heating oil and $10.99 per gallon of gasoline; Kivalina residents were paying $7.75 per gallon of heating fuel and $7.15 per gallon of gasoline. Ambler fuel prices are more volatile because fuel is flown in by airplane. Gasoline in Ambler on the same day was $9.40 per gallon of heating fuel and $9.60 per gallon of gasoline. Kotzebue prices had climbed to $6.36 per gallon of heating oil and $5.85 for gasoline. Communities with barged in fuels that must last the whole iced over winter season are locked into these high prices based on summer delivery prices. They will see no relief as oil prices decline.

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3 Grant Hildrent, Northwest Arctic Borough Planning Commission, personal communication, October, 2008 based on his conversations with fuel suppliers.
1.2.2 Impacts of Existing Red Dog Mine Operations on Cost of Living

The Red Dog Mine transports workers and supplies directly to the mine site thus reducing the potential for direct effects on the cost of living in the NWAB. Food, housing and energy provided to mine employees while at the mine may lower the cost of living for individuals or families with members employed at the mine site. Similarly, wages from mine employment helps individual families cope with the high costs of living and the costs of energy in particular. Payments in lieu of taxes (PILT) made to the NWAB also helps the borough cope with rising energy expenditures and pay the local contribution for schools that may otherwise have to be paid by residents of the borough through taxes.

1.3 Health

1.3.1 Background

Most health and social services programs offered in the NWAB are managed by Maniilaq Association (Maniilaq), a non-profit corporation. Maniilaq represents 12 federally-recognized tribes located in Northwest Alaska including all the villages in the NWAB plus Point Hope. Maniilaq manages social and health services for about 6,500 people. Maniilaq also coordinates tribal and traditional assistance programs, as well as environmental and subsistence protection services.

Maniilaq Association is one of the largest employers in the region with approximately 550 workers and is therefore a key component of the regional economy. Maniilaq health service facilities and programs including a health center, dental clinic, eye clinic, laboratory, Social Services Department, pharmacy, physical therapy, radiology, and 11 remote village clinics.

There are no direct economic linkages between Maniilaq operations and the Red Dog Mine. Maniilaq provides health and social services to mine employees that reside in the region and their families. However, there is no indication that the presence of the mine related population has any positive or negative impact on Maniilaq services in terms of cost or availability of services. In 2007, TCAK made a $106,500 contribution to Maniilaq Association in support of its cancer treatment program.

1.3.2 Health and Well Being

Section 3.13 of the SEIS discusses health indicator data for the NWAB and the linkages between social conditions and health outcomes. The SLiCA and the Social Transitions in the North (STN) survey yield additional perspective on the linkage between health and wellbeing. Martin (2007) found that health is an important indicator of well being. Well being is broader than health and includes opportunities for jobs, subsistence and participation in community life. Data from the surveys indicate that people who live in households that mix jobs and subsistence are healthier than people who live in households that do only one or the other. Respondents who reported giving and receiving subsistence foods and eating meals with relatives from other households also reported higher levels of health. Health is also a predictor of satisfaction with one's life as a whole (Martin 2005).

Haley and Magdanz (2008) analyzed SLiCA data to examine the effects of full time employment on social ties. They found that while high income households enjoy more social support than low income households, there is no difference in social support by employment status. Strong ties with family not living in the household do not vary by income or employment status, but “bridging” ties to diverse people outside the community are higher in high income households and higher for those who are employed full time.
1.3.3 Impacts of Existing Red Dog Mine Operations on Health and Wellbeing

The effects of existing Red Dog Mine operations on people on- and off-site are discussed in detail in the body of the SEIS (Section 3.13).

1.4 Education

1.4.1 Northwest Arctic Borough School District

Education in the region is provided by Northwest Arctic Borough School District. The district operates thirteen schools in eleven communities, with total enrollment in the district averaging over 2,000 students a year for the past 10 years. Schools in the district range in size from 43 students in Kobuk to 850 in Kotzebue (NWABSD website). The school district currently employs 185 teachers with an average class size of 18 students per class (NWABSD website).

Ninety-five percent of the students in the school district are Iñupiat Eskimo. Excluding Kotzebue, this percentage increases to 98 percent Iñupiat Alaskans. This is much greater than the statewide average Alaska Native population of 23 percent, and the average in the Anchorage School District of 13 percent (AK DEED).

Funding for the Northwest Arctic Borough School District comes from several sources. The district’s FY 2008 operating budget reports annual operating revenue of $45.8 million. Of that, $26.1 million came from the Alaska state aid programs (AK DEED). Contributions from the NWAB general fund totaled $3.8 million, which is approximately twice the required minimum local contribution.

Roughly 65 percent of the school districts funds are directed toward instructional expenditures. The district is also in the process of renovating or rebuilding the Ambler School, Kotzebue Middle/High School, the Napaqatugmiut School in Noatak, and the Kiana School. While the school district is able to bond for school construction and then request reimbursement from the State, the NWAB can fund the local contribution and bond for school construction largely as a result to the PILT payments received from the Red Dog Mine operation. This gives local residents more control of their schools than communities in the unorganized borough with insufficient local revenues to support education.

The Northwest Arctic Borough School District employs 17 Alaska Native teachers out of its pool of 184 certified staff, or 9.2 percent. This compares with 9.0 percent for the North Slope School District, but is about half of the Lower Kuskokwim and Lower Yukon School Districts. It is twice the rate of the Bering Straits School District (Table 6). These five districts average 12.7 percent Alaska Native teachers. However, the Northwest Arctic Borough School District numbers improved in recent years with three new Alaska Native teachers hired in the last three years. The statewide average for Alaska Native teachers is 4.5 percent.

Education research has linked high teacher turnover with lower student achievement. Some turnover is inevitable, as teachers retire, quit teaching, or move to other districts—and up to a point turnover is good, bringing in new teachers and ideas. In addition to being linked to lower student achievement, recruiting new teachers is expensive. There is no broad agreement about how much annual turnover is too much—some think more than 5 percent is too much—but most educators agree that by 20 percent, turnover is worrisome.

Higher teacher turnover is a chronic problem in Alaska rural school districts. Hiring Alaska educated teachers and specifically Alaska educated teachers from rural Alaska tends to reduce teacher turnover and improve student achievement. The Northwest Arctic Borough School District teacher turnover declined slightly from an average of 25 percent for the years FY 1999 to FY 2003 to an average of 22 percent for
1.4 Education

the years FY2003 to FY 2007. With the exception of the Lower Kuskokwim School District with 20 percent teacher turnover, the Northwest Arctic Borough School District compares more favorably than the other rural school districts in its region. It is similar to rural school districts statewide but over twice as high as urban districts that average 10 percent teacher turnover. The education scholarships offered by Teck have the potential to increase Native teacher hire and decrease teacher turnover.

1.4.2 Post-secondary Education

Two institutions, the Alaska Technical Center (ATC) and the Chukchi Community College, provide post-secondary education in the Northwest Arctic Borough. Both schools are located in Kotzebue. Along with two other regional organizations, the Northwest Arctic School District and Maniilaq Association, they comprise the Northwest Arctic Higher Education Consortium to provide an integrated system of post-secondary and vocational education to serve the needs of regional residents and employers.

The ATC is an adult vocational and technical education training facility operated by the Northwest Arctic Borough School District with state funding. It was built in 1981 as a way to help meet local demands for employment, particularly those opportunities anticipated by the potential opening of the Red Dog Mine. The ATC provides four areas of emphasis: office occupations, building industrial technology, industrial mine maintenance, and health occupations. The ATC program also provides a variety of short-term training opportunities depending on employment needs and demands. ATC collaborates in partnerships with industry and state agencies to respond to anticipated regional training needs and opportunities for job growth. For example, a recent partnership between ATC, NANA, and Plumbers and Pipefitters Local 375 provided a welder training program while introducing students to careers in the trades such as pipeline work. Programs are designed to mimic the workday schedule, with classes starting at 8:30 a.m. each morning and continuing through 4:30 p.m., helping students adjust to the workplace environment.

The ATC also provides basic skills instruction to adults in reading, writing, and mathematics in preparation for transitioning into the labor market, higher education, or vocational training. The GED preparation program assists students in all relevant areas including English, reading, science, social studies, and mathematics.

In 2006, the ATC GED program had 323 participants enrolled: Kotzebue (161), Noorvik (50), Selawik (33), Kiana (23), Kivalina (22), Deering (20), Ambler (11), Kobuk (10), Buckland (8), Noatak (6), and Shungnak (4). In the 2005-06 school year, the program had 44 graduates, both young and older adults, and approximately 30 graduated in 2007.

The Chukchi Community College, which is affiliated with the University of Alaska Fairbanks, works in conjunction with ATC to provide postsecondary education services to the region. Students in this college primarily attend classes via satellite-assisted audio conference, and use tools such as fax machines and email to correspond and interact with professors and fellow students (Chukchi Community College website). This allows many of these students to attend classes in their home village. By using distance learning tools, the college is able to offer two and four-year degrees in teaching, rural development, health, social work, and computers (Chukchi Community College website).

1.4.3 Educational Attainment

The adult population in the NWAB has a comparatively low rate of educational attainment: 72 percent of adults over the age of 25 have graduated from high school according to the 2000 U.S. Census (Table 6).
### Table G-6. Educational Attainment, 2000

<table>
<thead>
<tr>
<th></th>
<th>High School</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest Arctic Census Area</td>
<td>72%</td>
<td>13%</td>
</tr>
<tr>
<td>Alaska</td>
<td>88%</td>
<td>25%</td>
</tr>
<tr>
<td>Anchorage</td>
<td>90%</td>
<td>29%</td>
</tr>
<tr>
<td>Nome Census Area¹</td>
<td>75%</td>
<td>15%</td>
</tr>
<tr>
<td>Bethel Census Area²</td>
<td>71%</td>
<td>13%</td>
</tr>
<tr>
<td>North Slope Census Area</td>
<td>78%</td>
<td>17%</td>
</tr>
</tbody>
</table>

¹ Includes the Bering Strait REAA, Nome School District
² Includes the Lower Kuskokwim REAA, the Kuspuk REAA and the Yupiit REAA.

The trend over the last 30 years, however, has been improving. The percent of high school graduates in the Northwest Arctic region rose sharply between 1970 and 1980, increasing from 24 percent to almost 50 percent. High school graduation levels continued to rise in the 1990s, but at a slower pace, growing from around 50 percent in 1980 to around 65 percent in 1990. Since 1990, educational levels among Northwest Arctic region residents have lagged behind many other areas of the state, reaching 72 percent of adults with a high school diploma in 2000 compared with 88 percent for Alaska’s general population and 78 percent for other rural Alaska census areas.

Based on more recent data school attendance in the NWAB is lower than in Alaska as a whole, and lower than in the comparable school districts of other parts of rural Alaska (Alaska Department of Education 2006). Graduation rates are comparable to those of peer school districts, although still lower than in Alaska as a whole. Dropout rates in the Northwest Arctic Borough are lower than in peer school districts and appear to be approaching the average dropout rate across the state of Alaska.

Figure 1 shows school attendance rates by community, with no school in the Borough reaching the school attendance rates in the rest of the state (93 percent). In the communities of Kivalina and Noatak, graduation, attendance rates, and dropout rates vary greatly from year to year, but between the 2002/2003 and 2005/2006 school years, average attendance rates in the two communities have been 83 percent and 87 percent, respectively. These are in comparison to the borough average of 86 percent. It should be noted that because of the small number of students at these schools, the degree of variation in the data is quite high.

According to the SLiCA (Poppel et al. 2007), the percentage of the total population within the NWAB that has completed either vocational school or a college program is 36 percent. This percentage is relatively high compared to the North Slope Borough (25 percent) and the Bering Strait Region (18 percent).

### 1.4.4 Effects of Existing Red Dog Mine Operations on Education

The presence of the Red Dog Mine in the region has affected educational services and the level of education in the population in several ways. The Teck agreement with NANA stipulates measures for the education, training and employment of NANA shareholders at the Red Dog Mine. The 1982 agreement also provided for the establishment of a NANA-Teck joint employment and training committee, which supervises the hiring, training, and promotion of NANA shareholders.

As discussed below in Section 1.4.4.2, Teck provides support for education through its payments in lieu of taxes to the NWAB, which in turn, is an important source of funding for the Northwest Arctic Borough School District. Teck also provides direct funding to the school district.
Teck also supports several ongoing educational programs within the region. These include a School-to-Work program, a partnership with the University of Alaska, Alaska Native Science and Engineering Program, and full college scholarships for NANA shareholders. These programs are designed to help motivate students to graduate from high school, which is a minimum requirement for employment at the Red Dog Mine.

The School-to-Work program also incorporates Career Awareness and Job Shadow programs for high school students in the region. These programs serve to introduce students to the mine and help make them aware of job opportunities at the mine after graduation. As part of the Career Awareness Program, students travel to the Red Dog Mine for a two and a half day visit, during which they tour the mine and hear presentations from each department. After participating in the Career Awareness Program, juniors and seniors are invited to apply to the Job Shadow Program, where they have the opportunity to spend three and a half days at the mine, shadowing mine employees in individual departments. Teck provides transportation to and from the mine and housing for the students during their visit.

An estimated 80 students from the Northwest Arctic Region are selected each year for the Career Awareness program and roughly one-third of those students subsequently participate in the Job Shadow Program. The mine has hosted approximately 550 students over the life of the program.

In addition to the Career Awareness and Job Shadow Programs, Teck also supports high school students and those seeking higher education in the fields of science and engineering through its partnership with the University of Alaska’s Alaska Native Science and Engineering Program. In this program, students receive mentorship, summer programming, and follow-up support throughout high school and college to help them obtain an undergraduate degree in the field of science and engineering.

While the trend of higher educational attainment in the Borough cannot be directly attributed to any of these programs, there is some evidence that employment at the Red Dog Mine provides motivation for

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4 Attendance rates for the community of Kotzebue represent the weighted average of attendance rates at June Nelson Elementary School and Kotzebue Middle and High School.
youth to graduate from high school, as it is a minimum requirement to work at the mine. A survey of high school students in 1992 found that 47 percent of the respondents in the NWAB aspired to work at the mine (Hamilton and Seyfrit 1994). While this study predates many of the education programs now in place, it does indicate that working at the mine could be a motivating factor for educational attainment within the region.

1.4.4.1 Support of Higher Education

In addition to programs supporting K-12 education, Teck also supports higher education for NANA shareholders by providing scholarships for students who want to pursue post-secondary education. Teck’s first priority for these scholarships is given to those students who are pursuing studies that relate to employment at the Red Dog Mine, such as in mining operations, or apprenticeships for trades such as heavy duty mechanic, electrical, millwright and power generation. Many of the recipients of these scholarships study at technical and vocational schools throughout the state. Despite the emphasis on studies that pertain to employment at Red Dog, Teck also supports students in other fields as well, including education, healthcare and in fields related to employment at other NANA companies. Current scholarship recipients attend both two- and four-year programs at schools in- and out-of-state. It is common, however, for students on scholarship to return to the Northwest Arctic region and work seasonally at the mine while completing their studies. Teck strives to encourage this.

In addition to providing scholarships, Teck works closely with the ATC to support programs that provide training for working at the Red Dog Mine. From the mid 1990s through 2002, this partnership was particularly close; Teck provided monetary support for the school and awarded scholarships, while also providing transportation for students to and from and assisting in the selection of students for the program.

Staff from the ATC continues to work closely with Teck personnel to place ATC graduates in jobs at Red Dog. The Teck human resources staff passes along information on upcoming job openings and training needs. According to an ATC representative, 18 of 20 graduates participating in the 14-week spring session for millwright maintenance training under the Industrial Mine Technology program were placed in Red Dog related positions (D. Atoruk, personal communication).

1.4.4.2 Work Force Education

A high school diploma is the minimum education requirement for employment at the Red Dog Mine; however, many of the employment opportunities at the mine require additional training and education to successfully work and advance professionally. To facilitate continuing education, Teck provides on- and off-site education and training programs for shareholders including flexible work schedules and support for continuing education.

On-the-job training is one of the largest pieces of Teck’s workforce education programs. In 2007, Teck provided over 15,500 hours of on-the-job training for shareholders. This training occurred in every area of operation, including trade apprenticeships and opportunities in advanced technical training in geological, metallurgical and environmental fields. The bulk of these trainings, totaling roughly 11,000 to 12,000 hours, were directed towards 150 shareholder employees working in the departments of mill operations, mine operations, and the trade departments including heavy equipment, maintenance, power, millwright, and electrical (R. Sheldon, personal communication). These programs are designed to advance shareholders from a minimal skill level to becoming highly skilled in their profession. The success rate of shareholders completing the apprenticeship training has increased from a 30 percent completion rate in the early years of the mine, to a 70 to 75 percent completion rate in recent years (R. Sheldon, personal communication).
The incentives that Teck provides to pursue higher education may or may not be having a substantial impact on college degree attainment in the region. The high school diploma required for employment at the Red Dog Mine appears to have motivated an increase in high school diploma attainment in the region. However, employment at Red Dog does not necessarily provide a direct incentive to pursue higher education because a shareholder does not need a college degree to make a good salary at Red Dog since even starting salaries are much higher than most alternatives in the Northwest Arctic Borough. Furthermore, individuals motivated to pursue post-secondary education may not choose a career in mining and can take advantage of several other potential sources of scholarship money beyond the scholarships that Teck offers so as not to commit themselves to a career in the mining profession.

1.5 Ties to Nature

Knowledge of and respect for the land, sea, and animals are core Iñupiat values. Time on the land and sea is both a means to acquiring knowledge and an affirmation of connection and identity. Participation in subsistence activities and reliance on subsistence foods in the household diet are important in establishing and maintaining ties to nature. Subsistence harvests, use areas, and observed changes in wildlife are well documented in Section 3.12.

Residents of the NWAB report higher rates of participation in outdoor activities, including snowmobiling, dog sledding, hiking, walking and jogging, boating and “being out in the country,” than their neighbors to the north and south. In Kotzebue, 67 percent of Iñupiat adults went snowmobiling or dog sledding in the prior year, and 58 percent went boating or kayaking. In the outlying villages, the figures were 80 percent and 66 percent, respectively. They also report higher rates of being away from the community for a month or more for purposes to hunt or fishing or go to a camp or cabin: 10 percent overall. (Poppel et al. 2007).

1.6 Cultural Continuity

Cultural continuity is a key aspect of community well being in Arctic Alaska. This factor is particularly important when considering potential development projects that could irreversibly alter the lifestyle of a culture that has been maintained for centuries. A careful look at the prevalence and retention of Iñupiat culture in the villages around the Red Dog Mine is necessary to understand the effects that may have occurred as a result of existing operations and the potential impacts that could occur if mining operations were extended.

The Iñupiat people have survived and subsisted in northern Alaska for thousands of years. Historically skilled hunters and gatherers who subsisted primarily on whale, fish, caribou, moose, berries, and root plants, these ancestors occupied and survived off the land prior to contact with Russian explorers in 1818. The Iñupiat in the region today still take part in many of the same subsistence activities and share many of the same values as those of their ancestors. The population of the NWAB region is 85.5 percent Alaska Native according to the 2000 U.S. Census, and the Iñupiat way of life still provides framework and values for everyday life.

Over the last century and a half, however, this everyday life has undergone dramatic changes. In the late 19th and early 20th century, Western disease epidemics arrived along with explorers, whalers, traders and missionaries. Schools and churches promoted Western culture and suppressed the Iñupiat language and culture. Mid-century, the introduction of mandatory schooling pushed semi-nomadic families into permanent settlements and houses, accompanied by increasing reliance on store-bought goods. Increasing access to Western goods has been accompanied by increasing access to Western ills, specifically alcohol and drug abuse and domestic violence (see Section 3.13.2.1). In the latter part of the century the introduction of water, sewer, electricity, telephone, cable television improved the standard of living, while the need to pay for these goods and services prompted communities to increasing participating in the cash
Appendix G – Social Conditions

In response to these developments, Inupiat leaders in the 1980s in the Northwest Arctic sought to refocus the way of life to reflect core Inupiat values. These leaders felt that despite being better off physically and materially, there was a serious decline in the quality of life and social well-being. This prompted a movement toward social change, based on Native culture and centered on individual lifestyle changes and healthy personal habits. In 1981, the movement culminated in the codification of traditional Inupiat values in the Inupiat Ilitquiat, which translates roughly as “the wisdom and lessons of the Inupiat people” (McNabb 1991, p. 63). These are comprised of daily living principles prescribed by elders that characterize a healthy, productive Inupiat way of life. Ilitquiat also speaks to the inner spirit of a person—that which makes an individual unique and special. Elders suggested that if Inupiat are closely connected to their inner spirit, they will be happier, more productive members of society, and be able to better help others in their family and community (ibid.). This movement was a key step in the preservation of the Inupiat culture in the Northwest Arctic.

Furthermore, the Inupiat Ilitquiat “seeks to assert and validate Inupiaq ethnic identity, reactivate and preserve Inupiat skills, and solve pressing social problems by using traditional wisdom that is part of the essential heritage of the Inupiat.” (McNabb 1991) The movement is based on a set of cultural values chosen for their essence of what it means to be Inupiat, depicted by the ancient traditional lifestyle of the Inupiaq people. The foundation for the Inupiat Ilitquiat movement is based upon these core Inupiat principles:

- Know the Inupiaq language
- Share with others and try to be helpful
- Treat all people with respect
- Cooperate with others
- Respect the Elders
- Treat children with love
- Work hard and avoid idleness
- Know your family tree
- Avoid unnecessary conflict
- Respect all animals
- Don’t lose your sense of humor
- Meet your obligations to your family
- Respect successful hunters
- Learn Inupiat domestic skills
- Trust in a spiritual power greater than yourself

--(NUNA, 2(3) 1981)

Understanding these values is of great importance in framing the relationships, challenges and rewards involved with the continued development in the region. Evaluating the degree of cultural continuity in a community or a region is not a simple task. The primary indicator that is commonly used as a proxy for the degree of cultural continuity is that of Native language retention in the community. The SLiCA data (Poppel et al. 2007) provides additional information that may contribute to understanding cultural continuity.

1.6.1 Language Retention

The SLiCA data (Poppel et al. 2007) indicates that 33 percent of residents in the Northwest Arctic Region report that they speak Inupiaq very well and 41 percent report that they understand it very well. These values are just above the average among Arctic communities across northern Alaska, including the North...
Slope Region and the Bering Strait Region: overall, 32 percent of respondents report that they speak Iñupiaq very well and 39 percent report that they understand it very well.

The degree of language retention varies across communities. Only 16 percent of respondents from the regional hub of Kotzebue reported that they speak Iñupiaq very well, and 20 percent indicated that they could understand it well. This is in comparison to response rates in the ten villages of the region where 41 percent replied that they could speak well and 53 percent could understand it very well.

The Aqqaluk Trust Language Survey (2005) provides greater detail of language retention at the community level (Figure 2). The communities that have high rates of fluency also tend to have higher percentages of residents who are able to speak at least a little Iñupiat. Figure 3 also shows reported ability to understand the Iñupiaq language by community. The pattern for residents able to understand simple conversations in Iñupiaq is similar in both cases. Deering, Buckland, and Kivalina tend to have the lowest percentages in both of these measures. In analyzing data from the Aqqaluk Trust Language Survey, it is important to note that the categories in dividing degrees of fluency are different between this study and the SLiCA data set, and thus the results of the two surveys can not be directly compared.

![Figure G-2. Iñupiaq Language Speaking Ability by Community, NWAB](source)
It is important to note that both the Survey of Living Conditions in the Arctic and the Aqqaluk Trust Language Survey provide a snapshot of language retention at one point in time, thus missing the historical context in which these patterns emerged. Factors such as the degree to which the Iñupiaq language was permitted in schools during the early history of western education in the region can have a dramatic impact on the continued ability of residents to speak and understand the language today.

1.6.2 Other Measures of the Traditional Way of Life

The subsistence way of life is a key element of indigenous identity, as subsistence serves a wide range of economic, social and cultural functions in Iñupiat society, including:

- Food and nutrition; economic production, consumption, cost of living and economic security; sharing, social ties, and cultural identity; values and spiritual resilience; social capital in the form of reciprocity, trust, cooperation and leadership; and physical and mental health. Time on the land promotes observation-based knowledge, skills, experience, and judgment; hunting provides a positive outlet and valued social role for young men; and self-reliance promotes a sense of efficacy and fate control (Haley & Magdanz 2008).

Of the top five key activities and customs identified in SLiCA as important to cultural identity, four were related to subsistence: hunting, gathering, food preparation, and consumption. The Northwest Arctic region reported the highest levels of participation in subsistence activities, with 84 percent of Alaska Native adults in Kotzebue and 95 percent in the villages reporting participation in one or more types of subsistence activities in the past year (Poppel et al. 2007). Fifty-seven percent of households in Kotzebue and 70 percent of households in the NWAB villages reported that subsistence foods comprised more than half of their household consumption (Poppel et al. 2007).
Ninety-six percent of respondents in the Northwest Arctic region reported applying traditional values in their everyday lives, in comparison to 90 percent in the North Slope Region, 91 percent in the Bering Strait Region and 95 in Arctic Alaska overall (Poppel et al. 2007). Eighty-seven percent of respondents said that they apply traditional skills in their lives, equal to the overall Arctic Alaska average of 86 percent. This percentage was even higher in the villages than in the regional hub of Kotzebue. However, the percentage of respondents who indicated that they took part in some cultural event, such as a Native festival, listening to or telling a Native story, taking part in Native dance or in Native games tended to be lower in the Northwest Arctic region than in Alaska overall (Poppel et al. 2007).

In addition to taking part in and incorporating traditional cultural values into everyday life, the transmission of those values to future generations is a key piece in the continuity of culture over time. SLiCA data suggests that 80 percent of children in the Northwest Arctic region are learning traditional skills, a value that is lower than the Arctic Alaska average of 88 percent. Analysis of the SLiCA data suggests that residents of the NWAB are relatively satisfied with the strength of the Iñupiat culture in the region when compared to other regions in northern Alaska. However, 77 percent of respondents indicated that they were satisfied with the promotion of cultural values in the region compared to 72 percent in the Bering Strait Region, 89 percent in the North Slope Region, and 78 percent in Alaska on the whole (Poppel et al. 2007).

1.6.3 Effects of Existing Operations on Cultural Continuity

Evaluating the effects that the Red Dog Mine has had on cultural continuity within the region is a key piece of understanding the full impact of development in the region. In the face of impending change to the region as the result of the development at the Red Dog Mine, residents voiced a variety of concerns in two 1984 public hearings in Anchorage and Kotzebue regarding the way the development could play out. One of the central concerns raised in the hearings was the protection of the traditional way of life of the Iñupiat people. While this concept is difficult to directly quantify, indicators such as language retention, participation in subsistence activities, and cultural transmission provide a picture of the choices that people have made since the opening of the mine in 1989.

1.6.3.1 Effects on the Traditional Way of Life

The “Social Transitions in the North” survey (STN, conducted 1993, 1994, and 1995) and the SLiCA data provide some evidence on the health of the Iñupiat culture in the Northwest Arctic Borough since the development of Red Dog. As previously discussed, however, these studies provide a snapshot of the state of cultural integrity at the time that they were conducted, and do not provide a historical perspective of how these values have changed over time. Finally, while these surveys allow researchers to evaluate the activities of fully employed versus non-fully employed individuals, they cannot support an evaluation of the activities and perspectives of Red Dog employees in particular.

Analysis of the SLiCA data suggests that there is no significant difference in language retention between people who are employed full time and those who are not. The percentage of people who reported that they could speak (33 percent) or understand (41 percent) Iñupiat very well does not vary with full time employment. This suggests that employment at Red Dog mine does not negatively affect cultural factors such as language retention. However, language retention within a community is a factor that might be expected to change slowly over time, as elders who are fluent in the language pass away and the cultural knowledge is passed on to younger generations. The twenty years that have passed since the mine has been in existence may not have been enough time for this potential impact to be detected in the communities.
Furthermore, a key aspect of the traditional way of life for the Iñupiat people is the participation in hunting, preparing, and eating subsistence resources. An analysis of data from the STN survey indicates that respondents who ate more subsistence food worked for pay, on average, slightly less than those who ate less subsistence food. The average number of months in which the respondent worked at least two weeks for pay was slightly smaller for those respondents for whom at least half of the meat and fish eaten in the past year was subsistence food.5

Analysis of SLiCA data produces similar results: households whose meat and fish was at least half subsistence food had a slightly smaller percentage of adults in the household who worked full time. This difference is statistically significant at the 5 percent level across all three Alaska regions included in SLiCA, the North Slope, Bering Strait and Northwest Arctic, but not for solely Northwest Arctic households. However, there is no significant difference in the prevalence of full time employment when comparing by level of subsistence harvest rather than consumption. Fully employed persons place less emphasis on hunting, fishing, gathering and eating traditional foods as an important source of their Iñupiat identity than do people with less than full time employment. But there is no difference in the percentage of people that report applying traditional Iñupiat values in their personal life.

Despite some differences in the consumption of subsistence food between those respondents who work for pay and those who do not, residents of all types believe that cultural values are strong in the region and that they should be passed on to younger generations. There is no significant difference in the degree of satisfaction with the job the community is doing in promoting traditional values: most people are somewhat or very satisfied with their community’s commitment to practicing traditional culture. People who worked in a full time job for pay are equally as likely to respond that children should be taught traditional skills at home, although they are more likely to believe that they should learn traditional skills other places as well (Poppel et al. 2007). This data suggests that employment at the Red Dog Mine does not inhibit the transmission of cultural values to younger generations, but could also reflect the fact that individuals who work full time jobs may have less time available to take part in teaching these values.

Beyond these measures of cultural continuity, it is also necessary to consider other potential impacts on the cultural fabric of communities in the Northwest Arctic region. Since the development of the Red Dog Mine, issues such as the creation of internal conflict within communities, migration of residents out of the communities, and increased stress on the time commitments of community leaders have all been posed as potential impacts related to the mine. Supplemental EIS hearings, held by EPA and the state of Alaska in the fall 2007, provide perspective on current local perceptions and concerns regarding the Red Dog Mine. These hearings highlighted many concerns and differences of opinion in the community regarding the mine. When commenting about a 2004 lawsuit filed by the Kivalina Relocation Planning Committee against Teck for Clean Water Act violations, one resident stated “I am a Kivalina resident, but I do not really support the lawsuit that these six people brought up. And a lot of people-- a lot of people not only in the NANA region, but in the State read about that and they think it’s the whole community (Red Dog Mine Extension Scoping Transcript 2007, p. 52).”

This comment is particularly significant, as one of the core Iñupiat values is “avoiding unnecessary conflict.” Internal differences among community members are often very private and dealt with in a non-confrontational manner. The fact that a community member would voice disagreement in a public setting such as federal SEIS hearing suggests the degree of emotion felt about the mine.

5 The difference was statistically significant at the 5% level for the first and second years of the survey, and at the 10% level for the third year.
1.6.3.2 Migration

Outward migration has the potential to impact the social dynamics, and in turn, the cultural integrity of communities. A 1990s study in the region found that there was a higher tendency for young women to migrate out of rural areas than young men (Hamilton and Seyfrit 1994). The change in the gender ratios in the villages is often associated with an increase in social issues such as substance abuse, and high rates of teen pregnancy (ibid.). For both genders, 63 percent of students, and a higher number of female students, expected to move out of their home region (ibid., p. 190). The study also notes that the individuals who are most likely to leave are also those who tend to be energetic and ambitious. Thus, their absence has higher qualitative impacts on their home communities than the numbers might suggest (ibid.). We have no evidence either way whether the availability of jobs at Red Dog has the intended effect of encouraging ambitious young people to remain in the community.

The option of commuting from Anchorage to jobs at Red Dog might also make it easier to move out of the region. Between 1990 and 2000, the net migration rate out of the Northwest Arctic Region was -4.7 percent. This represents a larger number of people leaving the region than in the North Slope Region which had a net migration rate of positive 3.5 percent (though it has declined since 2000, due to declining borough property tax revenues from oil), but is not as high as the net migration rate in the Nome Census Area which was -8.6 percent. The Long Distance Commuting (LDC) program at the Red Dog Mine, providing free transportation between Anchorage and the mine site as well as from NWAB communities, has the potential to make outward migration more likely among Red Dog employees. The program provides additional flexibility to choose a home away from the region, and enables workers to migrate from their home village with fewer financial constraints. Similarly, the increased wage income from mine employment combined with economic factors such as housing availability or the high cost of living in the Northwest Arctic Borough may also make outward migration by Red Dog employees more prevalent. Teck records indicate that, since 1989, 20 Kotzebue residents that worked at the Red Dog Mine have moved out of the region. Twelve Ambler residents migrated out of the community as did nine Noorvik residents. A total of 60 Teck employees have moved out of the region over the life of the mine. (See Section 3.17, Table 3.17-20 for the numbers of migrated employees by community.) But this data does not tell us whether the rate of out-migration for Red Dog employees is any higher or lower than for other types of employees or for the unemployed in the region.

From the point of view of individual wellbeing, the option to stay or move is always better than not having a choice. An analysis of SLiCA data finds no relationship between full time employment and the desire to move, though it does not separate Red Dog Mine employees from other employed individuals who may have different options and incentives to remain in the community (Poppel et al. 2007). This leaves the impacts of the Red Dog Mine on migration patterns within the community inconclusive at this time.

Conversely, another potential impact on the cultural integrity of the region is immigration due to the mine. One of the key concerns brought up at the 1984 public hearings regarding the development of the Red Dog Mine site was the possibility of an influx of people from outside into communities and villages (Public Hearing Transcripts 1984). These individuals have the potential to bring stronger influences of western culture, which could further alter local culture. With this concern in mind, the mine and its related infrastructure was purposefully located away from any established villages to avoid directly impacting any one community. These interactions, however may still take place at the mine site between local and non-local employees.

The greatest impact was anticipated in Kotzebue as it serves as a gateway to the region, including the Red Dog Mine. While Kotzebue’s population has grown each decade between 1980 and 2000, the growth has not been noticeably different than other rural hubs. Kotzebue does have a lower percentage of residents who speak and understand the Iñupiat language than is average in the region, but there is no reason to
believe that this is due to an influx of outside individuals related to the Red Dog Mine rather than the result of being a larger city with more contact with western culture.

### 1.7 Fate Control

#### 1.7.1 Government and Public Services in the Northwest Arctic Borough

##### 1.7.1.1 Overview

The Northwest Arctic Region is comprised of approximately 39,000 square miles along the Kotzebue Sound, and the Wulik, Noatak, Kobuk, Selawik, Buckland and Kugruk Rivers. It is governed by the Northwest Arctic Borough and is the second-largest borough in Alaska after the North Slope Borough. The region contains eleven communities (Ambler, Buckland, Candle, Deering, Kiana, Kivalina, Kobuk, Kotzebue, Noatak, Noorvik, Selawik, and Shungnak; all communities except Noatak are incorporated cities with municipal governments. The population of the region is predominately Inupiat Alaskan and the tribal Indian Reorganization Act Councils (IRA) in each village also play a role in governance in the communities. According to the NANA Lands Department, about 76 percent of the land in the region is federally owned and managed as parks, preserves and wildlife refuges. Other major landowners include the State of Alaska, the NANA Regional Corporation, and the Kikiktagruq Inupiat Corporation. As a major landowner, the NANA regional corporation also plays a key leadership role in the region.

##### 1.7.1.2 Northwest Arctic Borough

The NWAB is a home rule borough, incorporated in 1986. According to the Alaska Constitution, a home rule borough can exercise any power not specifically prohibited by state law or by the borough’s charter, which defines its powers and duties and is adopted by voter approval. The Borough is governed by a mayor who is elected to a three-year term and an 11 member Assembly whose members are also each elected to a three-year term. The Assembly holds meetings once a month in Kotzebue. The Borough is responsible for holding yearly elections in October, during which the residents also vote on members the School Board and the Planning Commission.

The Northwest Arctic Borough provides a variety of services to the region including public safety, planning and zoning, the public library in Kotzebue, the regional Department of Motor Vehicles and regional economic development. One of the key functions of the Borough is to support education through the Northwest Arctic Borough School District. The Borough also participates in both the Higher Education Consortium and the Northwest Arctic Leadership Team with the Maniilaq Association, the Northwest Arctic Borough School District and NANA.

##### 1.7.1.3 Northwest Arctic Borough Revenue

The NWAB receives revenue from a variety of sources but TCAK PILT is the primary General Fund revenue source. An average of 68 percent of the NWAB’s General Fund revenues came from the TCAK PILT during fiscal years 2002-2007 (Table 7, Figure 4). Borough usage fees, which are fees paid by the NWAB School District to rent NWAB buildings in Kotzebue, contributed an average of 22 percent of General Fund revenues during the same period. When Borough usage fees are excluded, the TCAK PILT constitutes an average of 87 percent of General Fund revenue.

The Northwest Arctic Borough does not levy any taxes on its residents, although some communities within the borough have sales taxes (ADCCCED 2008).
Table G-7. Northwest Arctic Borough General Fund Revenues

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
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<th>2005</th>
<th>2006</th>
<th>2007</th>
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<tr>
<td>Teck PILT</td>
<td>4,200,000</td>
<td>5,500,000</td>
<td>6,403,000</td>
<td>6,228,000</td>
<td>6,328,000</td>
<td>8,721,473</td>
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<td>Borough usage fee</td>
<td>1,799,920</td>
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<td>Other Local Revenue</td>
<td>126,189</td>
<td>108,115</td>
<td>235,752</td>
<td>261,359</td>
<td>211,953</td>
<td>475,501</td>
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<td>State Revenue</td>
<td>145,874</td>
<td>158,084</td>
<td>79,251</td>
<td>-</td>
<td>5,838</td>
<td>633,267</td>
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<td>Federal PILT</td>
<td>466,127</td>
<td>489,334</td>
<td>562,212</td>
<td>577,210</td>
<td>590,115</td>
<td>636,441</td>
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<td>Total Revenue</td>
<td>6,738,110</td>
<td>8,055,453</td>
<td>9,080,135</td>
<td>8,866,489</td>
<td>9,261,922</td>
<td>12,592,698</td>
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</table>

Source: Northwest Arctic Borough, Basic Financial Statements and Supplementary Information, FY 2002-2007

Figure G-4. Northwest Arctic Borough General Fund Revenues

The NWAB has spent an average of $3.4 million per year on education from Fiscal Year 2002-2007 (Table 8, Figure 5). Additionally, an annual average of $1.7 million has been transferred to the NWAB School District to pay debt service on capital projects. Over this time period, education expenses have constituted 65 percent of General Fund expenditures. General Fund expenditures on government, public services, planning, and economic development have grown in proportion with total General Fund expenditures during the time period.

Table G-8. Northwest Arctic Borough General Fund Expenditures

<table>
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<tr>
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<th>2002</th>
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<th>2005</th>
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<td>General government</td>
<td>1,677,918</td>
<td>1,851,271</td>
<td>1,919,880</td>
<td>1,950,230</td>
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<td>Planning</td>
<td>440,867</td>
<td>180,364</td>
<td>208,607</td>
<td>324,194</td>
<td>423,750</td>
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<td>Public services</td>
<td>196,578</td>
<td>129,493</td>
<td>229,786</td>
<td>279,585</td>
<td>453,207</td>
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<td>Education</td>
<td>3,270,929</td>
<td>3,284,194</td>
<td>3,358,143</td>
<td>3,408,695</td>
<td>3,629,883</td>
<td>3,620,710</td>
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<td>Economic development</td>
<td>180,063</td>
<td>177,484</td>
<td>204,663</td>
<td>228,290</td>
<td>199,609</td>
<td>202,607</td>
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<td>Other transfers</td>
<td>825,615</td>
<td>2,325,223</td>
<td>941,644</td>
<td>2,109,521</td>
<td>2,019,077</td>
<td>2,146,084</td>
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<tr>
<td>Total expenditures</td>
<td>6,591,970</td>
<td>7,948,029</td>
<td>6,862,723</td>
<td>8,300,515</td>
<td>8,945,955</td>
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</table>

Source: Northwest Arctic Borough, Basic Financial Statements and Supplementary Information, FY 2002-2007
The Northwest Arctic Borough is working to develop short and long-term plans for the possibility of the closure and loss of revenue of Red Dog Mine. A savings account was established for short term use if mining operations cease. Long-term revenue prospects are much less certain. Increased state and federal revenue would likely be part a longer-term plan; dissolving the borough is another option if local revenues are insufficient to support education funding.

1.7.1.4 Municipal and Tribal Services and Finances

All of the communities in the NWAB are second-class cities, with the exception of Noatak, which is an unincorporated community. Ten of the eleven communities in the Northwest Arctic Borough have both a municipal government and a tribal council (Noatak has only a tribal council). Neither the municipal governments nor tribal councils have direct links to the Red Dog Mine. The division of services provided by each entity is generally clear, with separate funding sources and administrative bodies. Kiana is somewhat unique in that a single individual serves as the executive director of both the municipality and the tribal council, although each governing entity still has distinct revenue sources and the tribal council has a governing board. The NWAB provides services not provided by the Noatak tribal council.

Eight of the eleven communities have a sales tax, ranging from two percent to six percent. Kotzebue levies two special taxes, a six percent bed tax and a six percent alcohol tax. Services provided by municipalities commonly include water and sewer utilities, landfill operations, and cable television services, in addition to capital improvement projects. State and federal revenue often comes in the form of capital project funding. Table 9 provides an overview of regional community municipality revenues and expenditures for FY 2005. Additional detail characterizing the communities of Noatak and Kivalina is presented in Appendix D.
Table G-9. Municipal Revenues and Expenditures, Fiscal Year 2005

<table>
<thead>
<tr>
<th>Community</th>
<th>Local Revenues</th>
<th>Outside Operating Revenues</th>
<th>Outside Capital Revenues</th>
<th>Total Revenues</th>
<th>Operating Expend.</th>
<th>Capital Expend.</th>
<th>Total Expend.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambler</td>
<td>$208,767</td>
<td>$10,940</td>
<td>$28,700</td>
<td>$277,267</td>
<td>$251,444</td>
<td>$42,683</td>
<td>$294,197</td>
</tr>
<tr>
<td>Buckland</td>
<td>702,416</td>
<td>0</td>
<td>0</td>
<td>702,416</td>
<td>668,226</td>
<td>707</td>
<td>668,933</td>
</tr>
<tr>
<td>Deering</td>
<td>367,613</td>
<td>44,608</td>
<td>100,022</td>
<td>512,333</td>
<td>476,322</td>
<td>0</td>
<td>476,322</td>
</tr>
<tr>
<td>Kiana</td>
<td>681,182</td>
<td>6,166</td>
<td>44,702</td>
<td>732,140</td>
<td>657,404</td>
<td>0</td>
<td>657,404</td>
</tr>
<tr>
<td>Kivalina</td>
<td>214,608</td>
<td>10,249</td>
<td>0</td>
<td>225,057</td>
<td>290,833</td>
<td>0</td>
<td>290,833</td>
</tr>
<tr>
<td>Kobuk</td>
<td>201,052</td>
<td>1,241</td>
<td>25,000</td>
<td>227,293</td>
<td>222,380</td>
<td>0</td>
<td>222,380</td>
</tr>
<tr>
<td>Kolzebue</td>
<td>6,386,286</td>
<td>153,487</td>
<td>343,624</td>
<td>6,883,397</td>
<td>6,505,866</td>
<td>512,094</td>
<td>7,017,750</td>
</tr>
<tr>
<td>Noorvik</td>
<td>485,751</td>
<td>0</td>
<td>0</td>
<td>485,751</td>
<td>579,930</td>
<td>0</td>
<td>579,930</td>
</tr>
<tr>
<td>Scolowik</td>
<td>547,801</td>
<td>35,503</td>
<td>23,397</td>
<td>606,701</td>
<td>601,467</td>
<td>3,835</td>
<td>605,002</td>
</tr>
<tr>
<td>Shungnak</td>
<td>141,970</td>
<td>35,288</td>
<td>70,135</td>
<td>247,393</td>
<td>220,566</td>
<td>17,744</td>
<td>238,310</td>
</tr>
</tbody>
</table>

Source: Alaska Department of Commerce, Community, and Economic Development, Community Database
Note: Noatak is an unincorporated community and thus has no municipal finances. Water and sewer utilities, as well as landfill operation are handled by the local Village Council.

Seven of the communities (Ambler, Buckland, Deering, Kivalina, Kobuk, Noorvik, and Shungnak) have contractual agreements with the Maniilaq Association to provide services to community residents. Maniilaq receives per-community funding from the Bureau of Indian Affairs based on tribal enrollment in each community. Funding generally ranges from $70,000 to $150,000 per community. These funds are pooled by Maniilaq, and combined with funds from other sources, to pay for and implement community service programs such as food preservation, housing improvements, realty rights protection, subsistence hunting, traditional foods, tribal environmental protection, and the newly reinstated Village Public Safety Officer Program. Additionally, these communities receive monthly payments or a lump sum from Maniilaq under the Aide-to-Tribal Governments program. These payments cover tribal administration salaries and costs.

1.7.2 NANA Native Corporation

While not a government entity, the NANA Regional Corporation plays a significant role in the organization and delivery of public services in the Borough with input into programs such as workforce education, land use and the provision of services in the villages. NANA was established in 1971 under the Alaska Native Claims Settlement Act (ANCSA) as one of 13 Native-owned regional corporations. In addition to settling Native land claims to clear the way for the construction of the TransAlaska pipeline, one of the purposes of ANCSA was to foster economic development in Alaska, particularly in rural areas. Under ANCSA, individual villages also have the opportunity to incorporate village corporations. In the Northwest Arctic, only the city of Kotzebue chose to do so, creating the Kikiktagruck Inupiat Corporation (KIC). The remaining villages of the region pooled their assets through NANA to simplify land ownership and reduce administrative costs. Through the ANCSA process, NANA received both surface (2,246,075 acres) and subsurface (161,260 acres) title to lands in northwest Alaska, about 10 percent of the Borough (“This is NANA” 2008). In addition to lands, NANA received $44 million in cash. As one of the largest landholders and top five employers in the region, NANA plays a key leadership, making land use decisions and serving on both the Northwest Arctic Leadership Team and the Higher Education Consortium.

Currently, there are over 11,000 Inupiat NANA shareholders, 45 percent of whom live outside the borough. NANA is one of three regional corporations that voted to issues new shares to descendents of original shareholders born after 1971 (Thomson 1999). An elected board of directors makes up the governing body of the corporation. The board is responsible for making business decisions and meeting shareholders’ needs.
The NANA Regional Corporation serves as the parent company for the NANA Development Corporation, which is the business arm of the organization. Its biggest asset is ownership of the land and mineral rights of the Red Dog Mine, which is leased for operations to Teck. The corporation also has a non-profit arm called the Aqqaluk Trust with a mission to preserve and enhance the Ifupiat culture of the region. The trust provides scholarships for post-secondary education, grants for projects that promote Ifupiat values and culture, and a summer camp program to teach children traditional skills and traditional Ifupiat values.

Over 80 percent of the residents in the region are NANA shareholders. As a result, NANA has a vested interest in many aspects of life for residents in the Northwest Arctic Borough. This includes making land use decisions and providing support for services in many of the villages. For example, NANA recently donated the land for the new Noatak village school construction (NWABSD website). NANA also donated land for the construction of water and sewer systems in several communities. In addition, NANA plays a major role on the Northwest Arctic Leadership Team (NWALT), a collaborative group with representatives from The NWAB, the Northwest Arctic School District, NANA, and the Maniilaq Association. Formed in 2004, the NWALT serves as an advisory team, allowing each organization to share their goals, and for the team to seek common ground and support. These same four organizations are participants in the Higher Education Consortium, formed to help provide a more integrated system of post-secondary and vocational education to meet the needs of regional residents and employers. In efforts to achieve their goal of 100 percent shareholder hire at the Red Dog Mine, the development of education programs is important to helping NANA reach this goal to increase the number of shareholders who are eligible for employment. NANA president Marie Greene currently serves as the Consortium Chair.

1.7.3 Fate Control in the Northwest Arctic Region

The SLiCA data (Poppel et al. 2007) provide a snapshot of current local participation in civic activities and perceptions of local control in the Northwest Arctic Borough. When compared to the North Slope Region and the Bering Strait Region, the Northwest Arctic appears to have low to average participation in civic activities and politics and a moderate perception of control of their local environment and resources, including notably, the development at the Red Dog Mine.

Participation in public elections in the Northwest Arctic Borough varies by election type, but at most levels of government (national, state, city, traditional council) the percentage of voter participation is lower than that of peer regions. The only level at which the NWAB region has comparable rates of voter participation is in the Native regional corporation elections. Here, 63 percent of participants responded that they voted in the last election compared to an average of 61 percent for the three SLiCA Alaska regions. Participation in elections at all levels of government in the ten villages is higher than that of Kotzebue and is comparable to the Alaska average. Once again, there is an exception with Native regional corporation elections where both Kotzebue and the villages had a voter participation rate of 63 percent.6

In addition to civic participation, the SLiCA data set also provides insight into how respondents perceived local control in resource management and environmental protections. In these measures, the level of satisfaction felt by respondents from the NWAB is comparable to that of the North Slope Borough. The level of dissatisfaction reached levels as high as 49 percent of respondents when asked if they felt like their values were reflected in resource management actions. The Bering Strait Region showed much higher levels of dissatisfaction. Table 10 presents the percentage of respondents who were dissatisfied with resource management in each region.

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6 SLiCA data does not provide direct information on participation in Borough elections because of formatting in the survey questions.
Table G-10. Perceptions of Native Control of Resource Management in Arctic Alaska

<table>
<thead>
<tr>
<th>Perception</th>
<th>Northwest Arctic</th>
<th>Bering Strait</th>
<th>North Slope</th>
<th>Alaska Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of respondents who feel that fish and wildlife</td>
<td>49</td>
<td>58</td>
<td>49</td>
<td>53</td>
</tr>
<tr>
<td>management did not share their same idea of right and wrong</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissatisfaction with influence indigenous people have on</td>
<td>21</td>
<td>37</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>management of natural resources like fish and game</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissatisfaction with influence indigenous people have on</td>
<td>39</td>
<td>59</td>
<td>35</td>
<td>47</td>
</tr>
<tr>
<td>management of natural resources like oil &amp; minerals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissatisfaction with influence indigenous people have to</td>
<td>32</td>
<td>43</td>
<td>30</td>
<td>36</td>
</tr>
<tr>
<td>reduce environmental problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The Survey of Living Conditions in the Arctic (Poppel et al. 2007)

Forty-nine percent of survey participants in the NWAB responded that they felt that the managers of fish and wildlife in the region did not share their same idea of right and wrong. Twenty-one percent of respondents in the Northwest Arctic Region reported dissatisfaction with Native influence on the management of resources such as fish and game in the region. However, 39 percent were dissatisfied with the influence that Native people had on the management of natural resources such as oil and minerals and 32 percent were dissatisfied with the influence of Native people in the region to reduce environmental problems. As the Red Dog Mine is the only major developed mine in the region, these values are indicative of local perceptions of Native control of the Red Dog development. It is also interesting to note that levels of dissatisfaction regarding Native influence over environmental problems were higher in the Kotzebue (39 percent) than in the ten villages (29 percent).

1.7.4 Effects of Existing Operations on Fate Control

1.7.4.1 Impact of Red Dog Mine on the Northwest Arctic Borough

The NWAB was incorporated as a first class borough in 1986 and adopted a home rule charter in 1987. One key requirement for borough formation in the State of Alaska is that “the economy must have the human and financial resources capable of providing municipal services (AS 29.05.031(a)(3); 3 AAC 110.180).” In addition, all organized boroughs must operate school districts on an area wide basis and exercise planning and land use regulation throughout the region (Brockhorst, 2000, p. 6). Thus, to be successfully incorporated as a borough, the Northwest Arctic Region needed to show that it was economically capable of contributing the minimum local contribution amount to support the regional school district.

The Red Dog Mine played an important role in making the formation of the Northwest Borough possible, helping the region gain a valuable tool for self-determination and local control. Initially, the Red Dog area was within the jurisdiction of the North Slope Borough, which had organized in 1972. When the Northwest Arctic Borough organized, they petitioned the local boundary commission to move the boundary to include Red Dog in NWAB. This was approved in 1986 and incorporated approximately 5,600 square miles of territory from the North Slope Borough into the Northwest Arctic. Although the Borough was incorporated two years prior to the start of operations at the Red Dog Mine, the anticipated revenue to the borough from the mine, in the form of PILT, was a key factor that allowed the Borough to show it was able to fulfill its financial requirements. The PILT that was negotiated with Teck currently provides the largest source of funding for the borough and plays a substantial role in helping it to remain financially solvent and meet its obligations as a borough. Refer to Table 3.17-30 for details on all of the Borough’s sources of revenue.
Over the past 20 years, the expansion of both the Borough staff and services has paralleled the increasing amounts of Teck’s PILT. In recent years, the PILT has grown substantially, making Teck the largest single revenue source for the NWAB (Table 3.17-30). Revenue increases allowed the NWAB to expand from nine employees to fifteen, and increase funding for its four major departments: public services, planning, economic development, and education.

Without PILT funds from the Red Dog Mine, the NWAB would be more reliant on state and federal funds. For example, as noted by an NWAB official, the ongoing efforts to relocate Kivalina (due to severe coastal erosion) would be completely dependent on state and federal aid if the NWAB did not have significant revenue from the Red Dog Mine. These funds are not only important logistically, but give the region a sense of self-reliance and self-determination.

An analysis of SLiCA data shows that people working full time jobs for pay were significantly more likely to attend community or political meetings, write letters to the editor or volunteer in the local school. They were also engaged in more civic activities.

### 1.7.4.2 Local Control of Resource Development through NANA

The partnership between NANA and Teck is a unique relationship among resource development companies and indigenous people. Often, large resource extraction projects can have “severe and adverse social and cultural impacts on indigenous peoples… in some cases these are so severe as to threaten social and cultural survival” (O’Faircheallaigh 1991, p. 243). Several factors that placed the residents of the Northwest Arctic region in a more powerful position were the fact that “the NANA people owned the land and had full title rights to the area, the formal agreement provided for sharing of the financial benefits and details of the education and training commitments, and the recognition of the importance of maintaining the social and cultural values of the subsistence lifestyle in the communities” (Bittman & Horswill 2004, p. 6).

In 1974, NANA filed 14(h) land selections under ANCSA on the Red Dog Mine property. While shareholders at that time were not interested in mining, fearing effects on subsistence hunting and fishing resources, NANA wanted to control the rights to development. The claim was not resolved, however, until a 1980 Bureau of Land Management ruling allowed NANA to secure the title to the Red Dog Mine site. During the litigation period, NANA conducted region-wide discussions on potential mineral development. These included a series of shareholder meetings in local communities seeking approval to pursue mining with the promise of jobs and protection of ancestral lands. By the 1978 annual shareholder meeting, shareholders views changed and a majority voted to allow mining in their region. The public hearings for the Environmental Impact Statement on the Red Dog Mine in 1984 demonstrate that subsistence effects were a primary concern of many of the people in the region (Public Hearing Transcripts for Environmental Impact Statement, Red Dog Mine Project in Northwest Alaska – May 2,1984, p. 14). However, the elders of the region highlighted the need for development to create jobs and draw regional investment (NANA & Mining, accessed 2008). The history of the development of the Red Dog Mine is significant because resource development could not go forward without approval from NANA shareholders, giving the Native people of the region an uncommon and substantial degree of control.

As previously discussed, SLiCA data indicate that residents of the region are only somewhat satisfied with Native influence on the development of oil and mineral resources, with 39 percent expressing dissatisfaction. The degree of local control and involvement can also be seen in the fact that while voting in elections is relatively low compared to peer regions in Alaska, voting in the Native regional corporation elections is comparable to the average for arctic communities in Alaska.
However, the degree to which residents feel that they have control of mineral resources in their region is not uniform throughout the region. The 2007 public scoping hearings for the Supplemental Environmental Impact Statement for the Aqqaluk expansion to the Red Dog Mine provide perspective on current feelings regarding the Red Dog Mine. Several comments reflected the fact that the mine is an “important economic asset to the Northwest Region” and is responsible for “providing jobs and income that support many families” (Red Dog Mine Extension Scoping Transcript, 2007, p. 33, 22). The views expressed in the comments and questions made by multiple members of the communities of Kivalina and Noatak, however, demonstrate that there are some feelings of powerlessness and frustration regarding the development at the Red Dog Mine. This is notable as Kivalina and Noatak are the two communities in closest proximity to the mine. A more in depth discussion of the history of these communities and their relationship with the Red Dog Mine can be found in Appendix D. Comments from the SEIS scoping process suggest that while control of resource development is strong on a regional level through NANA, the feelings of control do not necessarily reach the level of the local villages.

Several key advisory committees help address challenges, oversee effects of the mining operations, and carry out terms of the 1982 NANA/Teck agreement. The Red Dog Management Committee, comprised of senior NANA and Teck representatives, meets quarterly to oversee general operations performance and review future plans. The 12-member committee plays a major role in management with authority to stop any mine operations having an adverse effect on the environment or subsistence resources.

The Subsistence Committee, also formed by the 1982 NANA/Teck agreement, was established to oversee subsistence matters and make certain that activities that occur at the mine do not harm or interfere with subsistence and environmental resources that sustain the Iñupiat way of life. The Committee is comprised of eight Elders and hunters from Noatak and Kivalina, and advises the Management Committee on major issues such as the timing of road closures for caribou migration, environmental permit renewals to minimize effects on caribou migration or fish and waterfowl habitat, and communicating emerging issues of concern. The Committee also played a role in determining the location of the DeLong Mountain Transportation System road (DMTS) to lessen impacts on animal migration (Alaska Department of Environmental Conservation 2002 p. 46). The NANA/Teck agreement stipulates that the Subsistence Committee meet a minimum of four times a year to discuss mine operations (Alaska Department of Environmental Conservation 2002, p. 46).

The Subsistence Committee provides an important structure to provide direct local input into mine management decisions. Public record of a meeting between the Subsistence Committee, Teck representatives and the Alaska Department of Environmental Conservation during the preparation of the DMTS Fugitive Dust Risk Assessment in 2005 gives insight into a forum where committee members were able to give comments and ask questions directly to Teck representatives (Subsistence Committee (2005)). It is unclear, however, how well this structure functions to affect mine operations and provide the locals residents of Kivalina and Noatak with a sense of local control over resource development on nearby land. Based on the continued levels of frustration and feelings of powerlessness expressed at the SEIS Scoping hearings in these communities, there appears to be a need for the effectiveness of this program to be carefully examined and improved upon to give local residents better access to information regarding the mine and a forum to discuss environmental management issues.

### 1.7.4.3 Recognition of Local Knowledge

Finally, the recognition and incorporation of local knowledge is a key aspect of maintaining a sense of fate control and self-determination for the people in the region. Despite being one of the world’s most significant zinc deposits, the actual footprint of Red Dog Mine is comparatively small, with the ore body occupying only one half square mile of land (NANA and Teck Cominco Ltd. n.d. p. 3). Beyond the landscape changes brought about by the process of ore extraction, mining can also affect subsistence
activities through pollution of waterways and habitat, dispersal of game or disruption of breeding patterns (O’Faircheallaigh 1991). The Iñupiat people living in the Northwest Arctic Borough have occupied the region for over 10,000 years, observing patterns in and living off of the resources of the land and ocean around them. Changes in the patterns and quality of subsistence resources have been noted by the Native people of the region, observations that, while not in the context of modern scientific methods, are based in a long tradition of usage.

More recently, environmental impacts have been reported by the NWAB communities, most notably Kivalina (Kivalina, 2001). These include lead, zinc and cadmium dust pollution along the haul road, spills of diesel fuel and metals concentrates, and the presence of elevated levels of total dissolved solids in the Red Dog Mine discharge. Beluga whale migration patterns have shifted and some residents have attributed this to Red Dog’s shallow water barge dock. Kivalina residents also attest that caribou migration patterns have been disrupted due to mine activity and pollution (Kizzia 2005, p. B1). Foxes without tails were also seen around the mine (Subsistence Committee 2005, p. 1). Observations of changes in water quality and fish health in the Wulik River prompted six Kivalina residents to sue Teck over violations of the mine’s National Pollutant Discharge Elimination System wastewater discharge permit. One Kivalina resident stated that the lawsuit was the only way to make Teck listen to their concerns.

The current SEIS procedure examining the proposed Aqqaluk expansion at the Red Dog Mine has been a valuable process in gathering local observations and knowledge regarding environmental impacts of the Red Dog Mine. Residents have had opportunity through scoping meetings and comment periods to share their perspectives regarding potential changes in the land, water, and resources that are integral to their everyday lives. Even as many of these factors are being evaluated by scientists and engineers, sensitivity and respect for traditional knowledge in this process is an important aspect of supporting local control of resource development in the region.

1.8 Environmental Effects of Proposed Action and Alternatives

1.8.1 Effects of Alternative A – No Action Alternative

The Red Dog mine has had [positive] effects on education, local governance and regional income, and negligible or uncertain effects on health, ties to nature, and cultural continuity. Social scientists have repeatedly found that in the mixed economy, local jobs and income are compliments to participation in subsistence, not substitutes. There is no evidence that employment accelerates the loss of Iñupiaq language. And concern about potential negative cultural effects galvanized a proactive collective response, the Iñupiat Ilitqsiat movement, to strengthen Iñupiat cultural values and identity.

As discussed above, discontinuing mining operations in 2012 would mean simultaneous losses of employment for residents, PILT to the NWAB, royalties to NANA and dividends to NANA shareholders. The cumulative shock to household budgets, local businesses and public services would likely constitute an economic recession in the region and strain family and community systems, as well as social service agency workloads. The loss of PILT to the borough would decrease the resources for and efficacy of local government and erode the sense of fate-control. If the borough was unable to raise enough revenue from other sources to pay its local share for schools, it could be forced to un-incorporate.

1.8.1.1 Effects on Kivalina and Noatak

The social effects on Kivalina and Noatak are directly parallel to the regional effects discussed above; more pronounced effects related to loss of employment would be expected as these communities rely more on Red Dog Mine for local employment and income. Although the mine has been a source of
1.8 Environmental Effects of Proposed Action and Alternatives

disharmony within the community of Kivalina, it is not likely that termination of mining operations would resolve these conflicts; more likely, new conflicts related to mine reclamation and adjusting to the decline in the village economy would take the place of current controversies over environmental issues.

1.8.2 Effects of Alternative B – Applicant’s Proposed Action

Alternative B would extend mine operations to 2031. Not only would the current level of mine benefits continue, but with increasing royalties to NANA local income from dividends may increase substantially (see SEIS Section 3.17). While on the whole increases in income would be beneficial, sudden large increases in income can also be socially disruptive and create transitional problems for financial management, planning and investment, not to mention attendant social problems such as increases in alcohol consumption, property crime and violence, and environmental problems from new consumption, such as many more trucks on village roads or rising demand for solid waste disposal. Potential effects on migration and work patterns are uncertain. The end of mining operations in 2031 would bring about the second half of the boom/bust cycle similar described under Alternative A. In this case, the bust would occur falling from a higher peak; however, there would be ample time for NWAB, NANA, and individuals to plan for the inevitable end of operations and prepare both fiscally, psychologically, and emotionally.

1.8.2.1 Effects on Kivalina and Noatak

The social effects on Kivalina and Noatak are directly parallel to the regional effects discussed above, with more pronounced effects related to employment as these communities rely more on Red Dog Mine for employment and income.

1.8.3 Effects of Alternative C – Concentrate Pipeline

Alternative C is similar to Alternative B, with somewhat higher capital costs and lower levels of employment, resulting in slightly more moderate effects on regional income. The social effects are substantially the same.

1.8.3.1 Effects on Kivalina and Noatak

Alternative C is similar to Alternative B, with somewhat lower employment.

1.8.4 Effects of Alternative D – Enhanced Dust Control

Alternative D is similar to Alternative B, with somewhat higher capital costs and slightly smaller effects on regional income. The social effects are substantially the same.

1.8.4.1 Effects on Kivalina and Noatak

The social effects are directly parallel to the regional effects discussed above, and substantially the same as in alternatives B and C with minor variations in employment levels.

References


http://usa.ipums.org/usa/

SLICA. ISER analysis of data from the Survey of Living Conditions in the Arctic, August 2008.

